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United States Coast Pilot 6

Great Lakes: Lakes Ontario, Erie, Huron, Michigan, and Superior and St. Lawrence River

April 1979

BEARINGS ARE TRUE AND DISTANCES ARE EXPRESSED IN STATUTE MILES

Corrected Through:

Local Notices to Mariners issued by Coast Guard District Commanders, November 14, 1978.

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National Oceanic and Atmospheric Administration
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National Ocean Survey
Allen L. Powell, Director

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LIMITS OF UNITED STATES COAST PILOTS

Atlantic Coast

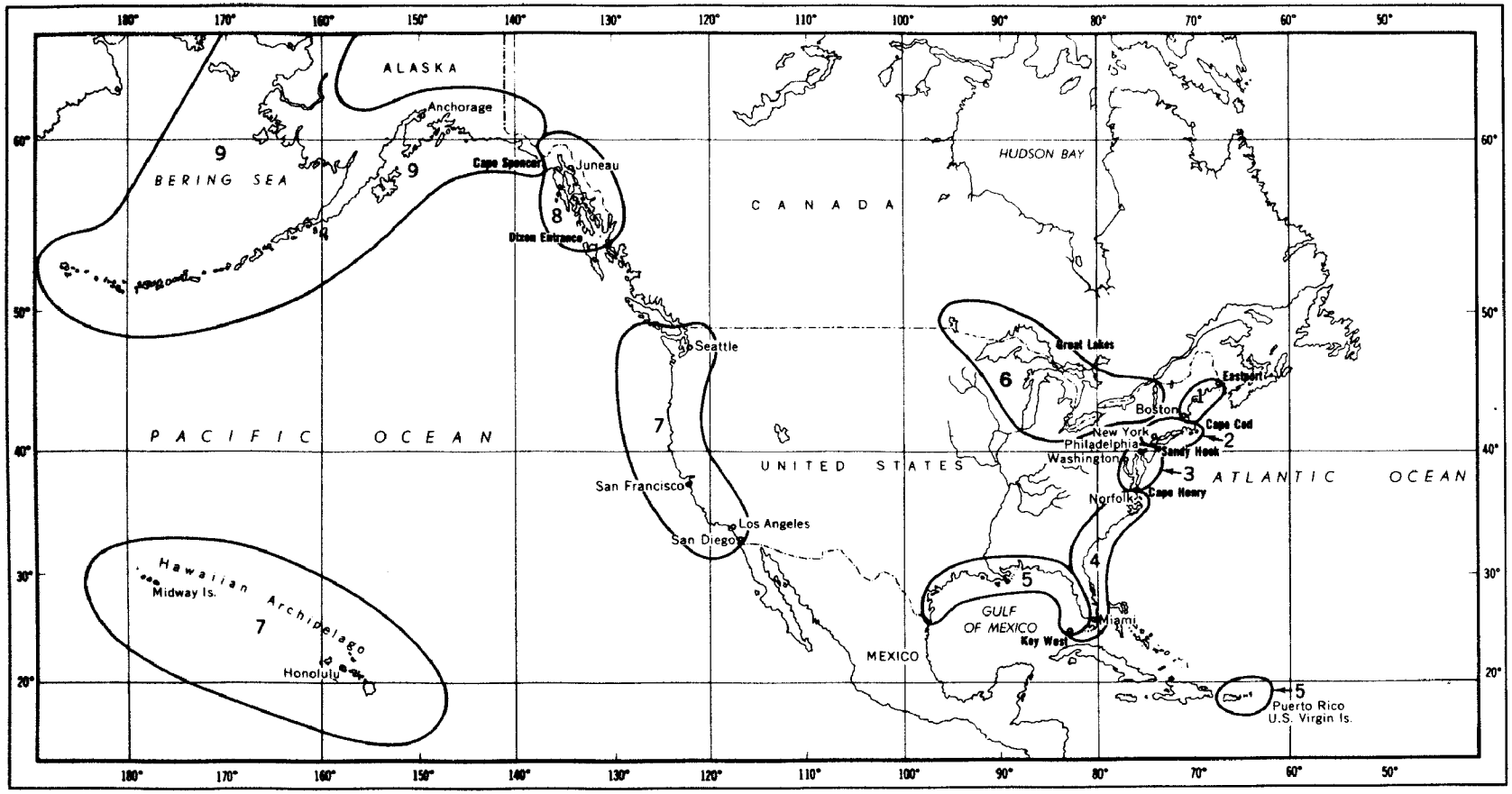
1 Eastport to Cape Cod
2 Cape Cod to Sandy Hook
3 Sandy Hook to Cape Henry
4 Cape Henry to Key West
5 Gulf of Mexico, Puerto Rico, and Virgin Islands

Pacific Coast

7 California, Oregon, Washington, and Hawaii
8 Alaska - - Dixon Entrance to Cape Spencer
9 Alaska - - Cape Spencer to Beaufort Sea

Great Lakes

6 The Lakes and their Connecting Waterways



Preface

United States Coast Pilots are published by the National Ocean Survey pursuant to the Act of 6 August 1947 (33 USC 883 a and b), and to the Act of 2 July 1958 (PL 85–480; 72 Stat. 279).

Coast Pilots supplement the navigational information shown on the nautical charts and are based upon field inspections conducted by the National Ocean Survey, information published in Notices to Mariners, and reports from NOAA survey vessels, other Government agencies, State and local governments, Canadian Ministry of Transport, maritime and pilotage associations, port authorities, mariners, and others.

This volume of Coast Pilot 6, Great Lakes, Lakes Ontario, Erie, Huron, Michigan, and Superior and St. Lawrence River, cancels the 1978 edition.

Caution: The Coast Pilot is corrected through the dates of Notices to Mariners shown on the title page, and should not be used without reference to the Notices to Mariners issued subsequent to those dates.

Mariners and others are urged to report promptly to the National Ocean Survey errors, omissions, or any conditions found to differ from or to be additional to those published in the Coast Pilot or shown on the charts in order that they may be fully investigated and proper corrections made. A Coast Pilot Report form is included in the back of this book for your convenience. Reports should be sent to Director, National Ocean Survey, Attention C324, Rockville, Maryland 20852.

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1. GENERAL INFORMATION

The Great Lakes.—Lakes Ontario, Erie, Huron, Michigan, and Superior, their connecting channels, and the St. Lawrence River, with a water-surface area greater than 95,000 square miles and a shore line of more than 8,300 miles, form a natural transportation highway which provides access to a region notable for the magnitude of its natural and industrial resources.

There are three navigable connections from the sea to the Great Lakes. (1) Via the St. Lawrence River from the Gulf of St. Lawrence. From the Strait of Belle Isle, at the mouth of the Gulf of St. Lawrence, the sailing distance to Duluth, at the head of Lake Superior, is about 2,340 miles; and to Chicago, at the head of Lake Michigan, it is about 2,250 miles. Approximately 1,000 miles of each distance is below Montreal, which is at the head of deep draft ocean navigation on the St. Lawrence River; approximately 975 miles of the route to Duluth and 950 miles of the Chicago route are in open lake water; the balance of the distances is traversed through restricted channels. (2) Via the Mississippi River from the Gulf of Mexico to Grafton, Ill., and thence via the Illinois Waterway to Lake Michigan at Chicago, Ill., a total distance of 1,531 miles. (3) Via the Hudson River from New York Harbor to Waterford, N.Y., thence through the New York State Barge Canal System to Lake Ontario at Oswego, N.Y., a total distance of 340 miles or to the Niagara River at Tonawanda, N.Y., a total distance of 496 miles.

The following table shows the governing dimensions for each of the three routes described above and for canal navigation in the Great Lakes system.

Limiting Measurements

	Depth	Width	Length	Vertical clearance
	Feet	*Feet*	*Feet*	*Feet*
St. Lawrence River**	26.0	76.0	730	117
Mississippi River—Illinois Waterway	9.0	80	600	17
N.Y. State Canals—Hudson River to Oswego	13.0	43.5	300	20
Hudson River to Whitehall, and from Three River Pt. to Ithaca, Montour Falls, and Tonawanda	12.0	43.5	300	15.5
Richelieu River—Lake Champlain to St. Lawrence River	6.5	22.5	112	29
Welland Canal**	26.0	76.0	730	117
St. Marys Falls Canal (Soo Locks)	+	110	1,200	120

+See Table under St. Marys River heading.
**Mininmum limiting measurements for transit of the entire Seaway by pleasure craft are a dead weight of one ton or twenty feet in overall length. These control factors are based on requirements for passage through the South Shore Canal, Beauharnois Canal and the Welland Canal. See also St. Lawrence River-Permissible Draft.

Associated with its operations on the Great Lakes, the National Ocean Survey publishes charts of Lake Champlain and of the natural navigable waters of the New York State Barge Canal System. It is also charged with the preparation of charts of the Minnesota-Ontario Border Lakes.

Charts.—The National Ocean Survey charts are lithographed in several colors to differentiate between deep and shallow water and land areas and to represent distinctly the lights and other aids to navigation. The series, as listed in the catalog comprises a general chart of the whole lake region, a general chart of each lake, coast charts of each of the lakes, and detailed charts covering harbors, rivers, and other important localities, for which a large scale is employed. The charts undergo periodic revision to reflect changes in navigational facilities and other important features. Aids to navigation are subject to constant revision, and are corrected to the date stamped at the bottom of each chart under the note "Aids to Navigation Corrected To." Thereafter, mariners should update their charts from information contained in the Notices to Mariners published by the U.S. Coast Guard, 9th District, Cleveland, Ohio, 3rd Coast Guard District, Governor's Island, N.Y., N.Y., the Canadian Ministry of Transport, Ottawa, Ontario, Canada and/or from Seaway Notices published by the Saint Lawrence Seaway Development Corporation, P.O. Box 520, Massena, N.Y. 13662.

NOTICE

Accuracy of a Nautical Chart.—The accuracy of a nautical chart depends upon the accuracy of the surveys on which it is based and the extent to which conditions have changed since the surveys were made. National Ocean Survey charts reflect what was found by field surveys and reported to NOS headquarters. They represent conditions at the time of the surveys and do not necessarily portray present conditions. Significant changes may have taken place since the date of the last survey.

Each sounding represents an actual measure of depth and location at the time the survey was made, and each bottom characteristic represents a sampling of the surface layer of the lake bottom at the time of sampling. Areas where sand and mud prevail, especially the entrances and approaches to harbors and bays and rivers exposed to strong currents and heavy seas, are subject to continual change.

In regions where rocks and boulders abound, it is always possible that surveys may have failed to find every obstruction. Thus when navigating such water, customary routes and channels should be followed and areas avoided where irregular and sudden changes in depth indicate conditions associated with pinnacle rocks, reefs or boulders.

Information charted as "reported" should be treated with caution in navigating the area because the actual conditions have not been verified by government surveys.

Depths.—Depths are in feet or fathoms, below **chart datum** of the chart unless otherwise stated. The **controlling depth** of a channel is the least depth within the limits of the channel; it restricts the safe use of the channel to drafts of less than that depth. The **centerline controlling depth** of a channel applies only to the channel centerline; lesser depths may exist in the remainder of the channel. The **midchannel controlling depth** of a channel is the controlling depth of only the middle half of the channel. **Federal project depth** is the design dredging depth of a channel constructed by the Corps of Engineers, U.S. Army; the project depth may or may not be the goal of maintenance dredging after completion of the channel, and, for this reason, project depth must not be confused with controlling depth. **Depths alongside wharves** usually have been reported by owners and/or operators of the waterfront facilities, and have not been verified by government surveys; since these depths may be subject to change, local authorities should be consulted for the latest controlling depths.

In general, the Coast Pilots give the project depths for deep-draft ship channels maintained by the Corps of Engineers. The latest controlling depths are usually shown on the charts and published in the Local Notices to Mariners. For other channels, the latest controlling depths available at the time of publication are given.

Caution in Using Small Scale Charts.—Dangers to navigation cannot be shown with the same amount of detail on small scale charts as those of larger scale. Therefore, the largest scale chart of an area should always be used.

Reporting chart deficiencies.—Users are requested to report all significant observed discrepancies in and desirable additions to NOS nautical charts, including depth information in privately maintained channels and basins; obstructions, wrecks, and other dangers; new landmarks or the nonexistence or relocation of charted ones; uncharted fixed private aids to navigation; and deletions or additions of small-craft facilities. All such reports should be sent to The Director (C322), National Ocean Survey, Rockville, Md. 20852.

Chart symbols and abbreviations.—The standard symbols and abbreviations approved for use on all regular nautical charts published by the Defense Mapping Agency Hydrographic/Topographic Center and NOS are contained in Chart No. 1, United States of America **Nautical Chart Symbols and Abbreviations.** The publication is available at all Defense Mapping Agency Hydrographic/Topographic Center and NOS sales agents.

On certain foreign charts reproduced by the United States, and on foreign charts generally, the symbols and abbreviations used may differ from U.S. approved standards. It is, therefore, recommended that navigators who acquire and use foreign charts and reproductions procure the symbol sheet or Chart No. 1 produced by the same foreign agency.

Small Craft Charts.—These specially designed charts are published with small-craft information and folded into convenient panels.

Recreational-Craft Charts.—A series of large-scale charts, published in book form, of certain harbors and confined localities of the Great Lakes.

Canoe Charts.*—A series of charts of the Minnesota-Ontario Border Lakes designed to suit the needs of small, shallow draft vessels. They do not show hydrography.

Conventional Charts.—The conventional flat nautical charts are assigned to one of the following scale groups:

Harbor Charts.—scales 1:50,000 and larger: They are intended for navigation and anchorage in harbors and small waterways.

Coast Charts.—scales from 1:50,000 to 1:150,000: They are intended for coastwise navigation inside the offshore reefs and shoals, entering bays and harbors of considerable size, and navigating certain inland waterways.

General Charts.—scales from 1:150,000 to 1:600,000: They are for use when a vessels course is well offshore, but when its position can be fixed by landmarks, lights, buoys and characteristic soundings.

Sailing Charts.—scales smaller than 1:600,000: They are plotting charts used for offshore sailing between distant coastal ports and for approaching the coast from the open ocean.

Caution: Various scales are employed to portray features in sufficient detail for the purpose of the different classes of charts. Hydrographic information is not generally shown for inshore areas on small-scale charts where larger-scale chart coverage is available. Mariners should always obtain large-scale chart for near shore navigation.

U.S. Nautical Chart Numbering System.—This new chart numbering system, adopted by NOS and the Defense Mapping Agency Hydrographic/Topographic Center provides for a uniform method of identifying charts published by both agencies. For charts published by NOS, a cross reference list of new and old chart numbers can be obtained, without charge, from National Ocean Survey, Distribution Division (C44), 6501 Lafayette Avenue, Riverdale, Md. 20840, or from any of its authorized sales agents. The Coast Pilot reflects only the new chart numbers. Use the new numbers when ordering charts.

Obsolete Charts.—Navigators are cautioned not to use obsolete charts because the information thereon may not represent current conditions. Natural and artificial changes, many of them critical, are occurring constantly, and it is important that navigators obtain up-to-date charts at regular intervals, and hand correct their copies from changes advertised in the weekly "Notice To Mariners" issued by the U.S. Coast Guard and the Canadian Ministry of Transport. Navigators are cautioned that when charts are obtained, the aids to navigation are correct only to the date indicated in the lower chart margin.

Notices to Mariners.—Important matters affecting navigational safety in the Great Lakes and their connect-

*Except charts 14999, 14996, 14997, and 14998 which show hydrography.

ing waters are published in Notices to Mariners and Seaway Notices; urgent items are also broadcast by radio. Notices to Mariners are published by the U.S. Coast Guard and Canadian Ministry of Transport. Seaway Notices are published by the Saint Lawrence Seaway Development Corporation and the St. Lawrence Seaway Authority. Additional information regarding U.S. Coast Guard notices and broadcasts is detailed in following paragraphs under U.S. Coast Guard. Notices provide information which the mariner should use to update the latest editions of charts, Light Lists, Coast Pilot 6 and other marine publications.

Caution, Channel Markers.—Lights, daybeacons, and buoys along dredged channels do not always mark the channel edges. Due to local conditions and the effects of sea conditions, aids may be located inside or outside the channel limits shown by dashed lines on the charts. Aids may be moved, discontinued, or replaced by other types to facilitate dredging operations. Mariners should exercise caution when navigating areas where dredges with auxiliary equipment are working.

Temporary changes in aids are not included on the published charts.

Acceptable Vessel Watering Points.—Under the provisions of the Control of Communicable Diseases Regulations (21 CFR 1240) and Interstate Conveyance Sanitation Regulations (21 CFR 1250), vessel companies operating in interstate traffic shall obtain potable water for drinking and culinary purposes only at watering points found acceptable to the Food and Drug Administration (FDA), Public Health Service, Department of Health, Education and Welfare. Water supplies used in watering point operations must also be inspected to determine compliance with applicable Interstate Quarantine Regulations (42 CFR 72). These regulations are based on authority contained in the Public Health Service Act (PL 78-410). Penalties for violation of any regulation prescribed under authority of the Act are provided for under Section 368 (42 USC 271) of the Act.

FDA publishes a list of Acceptable Vessel Watering Points as of January 1 each year. This list is available from most FDA offices or from Interstate Travel Sanitation Branch, FDA, HFF-324, 200 C Street SW., Washington, D.C. 20240. Since the acceptability of watering points may have changed since January 1, their current status must be obtained by contacting any of the FDA offices listed in the appendix.

Oil Pollution.—The Oil Pollution Act, 1961, as amended, provides for prohibited zones throughout the world within which the discharge of oil or any oily mixture is unlawful. The prohibited zones for the United States, Puerto Rico, the U.S. Virgin Islands, and adjacent foreign territory include sea areas within 50 miles from the nearest land and the following sea areas extending more than 50 miles from the nearest land: North-West Atlantic Zone, comprising the sea areas within a line drawn from 38°47′ N., 73°43′ W., to 39°58′ N., 68°34′ W., thence to 42°05′ N., 64°37′ W., thence along the east coast of Canada at a distance of 100 miles from the nearest land. Canadian Western Zone (Pacific Ocean), extending for a distance of 100 miles from the nearest land along the west coast of Canada.

The law applies (with the exceptions stated below) to any seagoing vessel of any type whatsoever of American registry or nationality, including floating craft towed by another vessel making a sea voyage; this includes a "tanker," defined as a type of ship in which the greater part of the cargo space is constructed or adapted for the carriage of liquid cargoes in bulk and which is not, for the time being, carrying a cargo other than oil in that part of its cargo space. The excepted categories of vessels are: tankers of under 150 gross tons, and other ships of under 500 gross tons; ships for the time being engaged in the whaling industry when actually employed on whaling operations; ships for the time being navigating the Great Lakes of North America and their connecting and tributary waters as far east as the lower exit of St. Lambert Lock at Montreal in the Province of Quebec, Canada; naval ships and ships for the time being used as naval auxiliaries.

Foreign vessels to which the International Convention for the Prevention of the Pollution of the Sea by Oil (1954, as amended) applies, while in the territorial waters of the United States, may be boarded, examined, and required to produce records as provided in Section 11 of the Oil Pollution Act of 1961, as amended. (For a complete discussion of the Oil Pollution Regulations, see the Code of Federal Regulations, Title 33, Part 151.)

The Federal Water Pollution Control Act, as amended, prohibits the discharge of harmful quantities of oil into the navigable waters of the United States, the contiguous zone, or onto adjoining shorelines. Discharges that do occur must be reported to the Coast Guard by the most rapid available means. If the spiller or other industry organization, or State or local government, does not clean up the spill, the Federal Government may. The spiller will be liable for the cleanup costs. A harmful discharge of oil has been defined as one which causes a film or sheen upon or discoloration of the surface of the water, violates applicable State water quality standards, or causes a sludge or emulsion to be deposited beneath the surface of the water. (For regulations pertaining to this Act, see the Code of Federal Regulations, Title 33, Part 153.)

Cable ferries.—Cable ferries are guided by cables fastened to shore and sometimes propelled by a cable rig attached to the shore. Generally, the cables are suspended during crossings and dropped to the bottom when the ferries dock. Where specific operating procedures are known they are mentioned in the text. Since operating procedures vary, mariners are advised to exercise extreme caution and seek local knowledge. **DO NOT ATTEMPT TO PASS A MOVING CABLE FERRY.**

Other requirements for the protection of navigable waters.—U.S. laws prohibit discharge from any vessel or shore establishment of any refuse matter, other than that flowing from streets and sewers in a liquid state, into any navigable water unless the vessel is equipped with a

Coast Guard certified flow-through marine sanitation device. It is not lawful to tie up or anchor vessels or to float lografts in navigable channels in such manner as to obstruct normal navigation.

Great Lakes Water Levels.—Mariners are cautioned that fluctuations in water levels of the Great Lakes and connecting rivers may result in available depths being less than charted depths due to low levels, and in the covering of low lying islands, docks and other charted features due to high levels. (See appendix for a list of water level publications published by NOS and the Corps of Engineers.)

Time.—The areas covered by this Coast Pilot use two time zones. With the exceptions noted below eastern standard time (e.s.t.) is observed by the State of Michigan, areas east of it and the lakeshore areas of the Canadian Province of Ontario. Eastern standard time is 5 hours slow of Greenwich mean time (G.m.t.). Example: when it is 1000 at Greenwich it is 0500 at Detroit, Mich.

Central standard time is observed in the lakeshore areas of Indiana and the areas westward to the International Boundary at Pigeon River, Minn. This includes the Michigan communities south of Bark River on Green Bay and west of longitude 89°50.7′W., which is about midway between Silver City and Black River Harbor, on Lake Superior. Central standard time is 6 hours slow of Greenwich mean time (G.m.t.). Example: when it is 1000 at Greenwich it is 0400 at Chicago, Ill.

Daylight saving time.—Throughout the area of this Coast Pilot, clocks are advanced 1 hour on the last Sunday in April and are set back to standard time on the last Sunday in October.

AN AGREEMENT BETWEEN THE UNITED STATES OF AMERICA AND CANADA FOR THE PROMOTION OF SAFETY ON THE GREAT LAKES BY MEANS OF RADIO

The Government of the United States of America and the Government of Canada, being desirous of promoting safety of life and property on the Great Lakes of North America by means of radio, and believing that this purpose will be served by making provisions in common agreement for radiotelephone communication for safety purposes, including radiotelephone communication as an aid to and instrument of navigation, and considering that this objective may best be achieved and maintained by the conclusion of an Agreement between the two Governments, have entered into such an Agreement with date of entry into force as May 6, 1975.*

The Regulations following are extracted from the Agreement in which they constitute an annex:

* * * * *

*Terminates 1952 Agreement.

TECHNICAL REGULATIONS

Regulation 1

Location and Control of the Radiotelephone Station

Every radiotelephone station shall include one or more transmitters, one or more receivers, one or more sources of electrical energy, associated antennas and control equipment, and shall conform to the following:

(*a*) The radio telephone station, exclusive of the antennas and source of electrical energy, shall be located as high as practicable on the vessel, preferably on the bridge, and suitably protected from the harmful effects of water, temperature, electrical and mechanical noise;

(*b*) The main operating position of the radiotelephone station shall be on the bridge, convenient to the conning position;

(*c*) Where the radiotelephone station is located elsewhere than on the bridge, provision shall be made for complete operational control of the equipment at that location and at the bridge operating position. However, provision shall be made to take immediate and complete control of the equipment at the bridge operating position;

(*d*) Provision shall be made for illuminating the operating controls at the main operating position;

(*e*) Means shall be provided for charging any storage battery used in connection with the radiotelephone station.

Regulation 2

VHF and MF Radiotelephone Equipment

1. Effective May 6, 1975, every vessel shall have equipment complying with Section I of this Regulation.

2. Effective May 6, 1975, every vessel of 500 gross tons or more shall have equipment complying with Section I and II of this Regulation.

3. Effective May 6, 1975, every vessel of less than 500 gross tons shall have equipment complying with either Section I or II of this Regulation.

SECTION I—VHF RADIOTELEPHONE EQUIPMENT OPERATING IN THE BAND 156–162 MHZ

(*a*) The frequency 156.8 MHz is the distress, safety and calling frequency in the band 156–162 MHz for all stations of the Maritime Mobile Service in the Great Lakes Area.

(*b*) The VHF radiotelephone equipment shall comply with the technical characteristics prescribed in the International Radio Regulations for transmitters and receivers using 50 kHz spacing between adjacent channels. Such equipment on vessels of Contracting Governments shall also comply with the technical regulations of the respective countries.

(*c*) Notwithstanding paragraph (b) of this Section, above, the Contracting Governments by mutual agreement may establish a date after which all vessels shall comply with the technical characteristics prescribed in the International Radio Regulations for transmitters and receivers using 25 kHz spacing between adjacent channels.

(*d*) The VHF radiotelephone equipment shall be capable of transmitting and receiving speech on at least the following VHF channels:

Channel 16—156.80 MHz—Distress, safety and calling.
Channel 6—156.30 MHz—Primary intership.
Channel 12—156.60 MHz.
Channel 14—156.70 MHz.

Such other frequencies as are required for their service.

NOTE.—The Contracting Governments recognize that the vessel's radiotelephone equipment may be used, in addition, for public correspondence and other purposes, such as the reception of weather broadcasts. Also, other frequencies may be required for vessels entering the Great Lakes via the St. Lawrence River. It is assumed, therefore, that the additional frequency channels for such purposes will be available on individual ships, according to their requirements.

(*e*) The radiotelephone transmitter shall be capable of delivering at least 15 watts carrier power to the antenna or antennas specified below. In the case of transmitters using 25 kHz spacing between adjacent channels, as may be required under paragraph (c) of this Section, above, provision shall be made to reduce this power readily to 1 watt.

(*f*) The VHF radiotelephone receiver shall have a sensitivity of at least two microvolts across 50 ohm or equivalent input terminals, for a 20 decibel signal-to-noise ratio.

(*g*) The associated antennas shall be effective, vertically polarized and located as high as practicable on the masts or superstructure of the vessel. The transmission line shall be effective and, to the extent practicable, shall impose a minimum loss.

SECTION II—MF RADIOTELEPHONE EQUIPMENT OPERATING IN THE BAND 2000–2850 KHZ

(*a*) The frequency 2182 kHz is the distress, safety and calling frequency in the band 2000–2850 kHz for all stations of the Maritime Mobile Service in the Great Lakes Area.

(*b*) The MF radiotelephone equipment shall comply with the technical characteristics prescribed in the International Radio Regulations for transmitters and receivers. Such equipment on vessels of Contracting Governments shall also comply with the technical regulations of the respective countries.

(*c*) The MF radiotelephone equipment shall be capable of transmitting and receiving speech on at least the following MF channels:

Channel 51—2182 kHz—Distress, safety and calling.
Channel 52—2003 kHz—Primary intership.

Such other frequencies as are required for their service.

NOTE.—The Contracting Governments recognize that the vessel's radiotelephone equipment may be used, in addition, for public correspondence and other purposes such as the reception of weather broadcasts. It is assumed, therefore, that the additional frequency channels for such purposes will be available on individual ships, according to their requirements.

(*d*) The MF radiotelephone transmitter shall be capable of delivering, for double sideband emission, at least 50 watts carrier power, or for single sideband at least 100 watts peak envelope power to the antenna or antennas specified in paragraph (e) of this Section.

(*e*) The associated antenna shall be non-directional and, when practicable, have an efficiency of 23%.

(*f*) The receiving installation shall be capable of properly energizing a loud speaker when the radio field intensity of the received carrier wave (measured when no modulation is present) is as low as 10 microvolts per meter.

Regulation 3

Trial of Radiotelephone Installation

Each calendar day that a vessel is navigated, unless the normal use of the radiotelephone station demonstrates that the equipment is in proper operating condition for an emergency, a test communication for this purpose shall be made by a properly qualified person. Should the equipment be found by some person other than the master not to be in proper operating condition for an emergency, the master shall be promptly notified thereof.

Regulation 4

Operator Certificate

1. The person whose qualifications for radiotelephone operation for safety purposes on the Great Lakes must be certified, as stated in Article VII of this Agreement, shall possess the following qualifications:

(*a*) General knowledge of practical radiotelephone operating procedure;

(*b*) Ability to send correctly and to receive correctly by radiotelephone using the English language; and

(*c*) Knowledge of the International Radio Regulations and specifically of that part of those Regulations relating to the safety of life.

2. In lieu of the requirements set forth in paragraph 1, above, a person shall be deemed to have the qualifications specified in paragraph 1 of this Regulation, if such person is the holder of a valid operator license or certificate which is the equivalent of, or of a higher class than, the restricted radiotelephone operator's certificate: *Provided, however*, That such person can demonstrate to the satisfaction of representatives of either of the Contracting Governments his ability to speak and understand the English language: *And provided, further*, That nothing in this paragraph shall be construed to change any of the requirements of the domestic law of Canada or the United States with respect to the acceptability of a radio operator license or certificate held by a person not a citizen of Canada or the United States for the operation of a radio station licensed by Canada or the United States.

Regulation 5

Record of Use of Radiotelephone Station for Safety Purposes

1. Each vessel shall have on board a record in appropriate form in which the following entries shall be made

by an operator who has been certified as required by Article VII of the Agreement, or by a person on duty listening as required by that Article, or by a licensed or certificated deck officer:

(*a*) The name, country of registry, and official number of the vessel;

(*b*) The name and radio certificate number of each operator who has been certified as required by Article VII of this Agreement and designated by the master to operate the radiotelephone station in such a form as to indicate when each such person was actually on board;

(*c*) The name of the person making the particular entry;

(*d*) All incidents of an unusual or exceptional nature, including the date and time thereof (Eastern Standard Time), connected with the use of radiotelephone which are of importance to safety, and in particular the substance of all distress calls and distress messages. Entries shall be made as soon as practicable after their observed occurrence, and in the case of distress shall include a statement of the location of the vessel at the time of the incident;

(*e*) Details of the maintenance, including a record of the charging of any storage batteries which are necessary for the proper operation of the radiotelephone station; and

(*f*) An entry shall be made each day that a vessel is navigated showing the operating condition of the equipment as determined by either the normal communication or the test communication required by Regulation 3 and showing that, if an improper operating condition was found, the master was properly notified thereof.

2. The record required by paragraph 1 of this Regulation shall be kept at the main radiotelephone operating location on the bridge while the vessel is being navigated. All entries in their original form shall be retained on board the vessel for a period of not less than one month from the date of entry; and for an additional period of not less than eleven months from the date of entry either on board the vessel or elsewhere as determined by the country to which the ship belongs. During this period, this record shall be available for inspection by the officers authorized by the Contracting Governments to make such inspections.

Regulation 6

Reserve Ship Radiotelephone Station or Auxiliary Power Source

The Contracting Governments, each with respect to their own vessels, may require the fitting of a reserve radiotelephone station having an independent source of power, or an auxiliary power source for the main radiotelephone station.

Regulation 7

Coast Station Distress Watch

Each Contracting Government agrees to ensure that necessary arrangements are made for coast stations to maintain an effective continuous aural watch on the radiotelephone distress, safety and calling frequency or frequencies.

NOTE.—See also **Vessel Bridge-To-Bridge Radiotelephone Regulations in 33 C.F.R. Part 26 § 26.09 of Rules and Regulations, following.**

MARINE RADIO TELEPHONY

Although recreational boats are not required to carry radiotelephone equipment, proper use of this equipment can contribute greatly to the safety and convenience of navigation. For boats equipped with a radiotelephone set, help is just a radio signal away. The U.S. Coast Guard maintains continuous listening watch on distress frequency VHF–FM channel 16 (156.80 MHz). Once contact is made on channel 16 one shifts to VHF–FM channel 22 (157.10 MHz). Limited listening watch, on a secondary, not-to-interfere basis with the primary distress guard on channel 16, is maintained on citizens band channel 9 (27.065 MHz), AM only. Coast Guard vessels are not CB equipped.

By utilizing the services of public coast stations, boats may make and receive telephone calls to and from any telephone. Information on public coast stations in the Great Lakes area is contained in the manual, Marine Radio Telephony. This manual may be purchased from the Radio Technical Commission for Marine Services, Post Office Box 19087, Washington, D.C. 20036. The manual contains data on procedures and regulations for the operation of a radiotelephone set.

See also U.S.-Canada Agreement for Promotion of Safety on the Great Lakes by Means of Radio in this Chapter and Vessel Bridge-To-Bridge Radiotelephone Regulations in 33 C.F.R. Part 26 of Rules and Regulations.

U.S. COAST GUARD

Maintenance of Aids.—Aids to navigation in United States waters of the Great Lakes and their connecting waters are maintained by the U.S. Coast Guard. Local jurisdiction for the region is assigned to the Commander, Ninth Coast Guard District, Federal Office Building, 1240 East 9th Street, Cleveland, Ohio, 44199. The Lake Champlain region and the Hudson River are under the jurisdiction of the Commander, Third Coast Guard District, Governors Island, N.Y. 10004.

Light List, Great Lakes.—The Light List, published annually, describes all aids to navigation maintained in these waters by the U.S. Coast Guard, all private aids approved and authorized by the U.S. Coast Guard, all aids to navigation of the U.S. St. Lawrence Seaway Development Corp., and some lighted aids and fog signals maintained by the Federal Government of Canada.* An introductory article explains in detail the character, method of

*The Canadian list of lights, buoys and fog signals, Inland Waters, West of Montreal and East of British Columbia, is a publication of the Aids and Waterways Branch, Ministry of Transport, Ottawa, Ont., K1A ON7 Canada. It is a sales item available from Information Canada, Ottawa, Canada under 1976 catalogue No. T34–6/1976.

arrangement, and purpose of the various types of lights, buoys, fog signals, and radiobeacons. Mariners should have the latest list, which may be purchased by mail directly from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, and at other points listed in Notice to Mariners.

Notices to Mariners.—Great Lakes local notices are published by the Commander, 9th Coast Guard District, Cleveland, Ohio 44199, and contain information on changes in aids to navigation and other marine information affecting the safety of navigation on the Great Lakes. These notices may be obtained, free of charge, by making application to Commander, 9th Coast Guard District. The mariner should keep his charts and Light List appropriately corrected from the weekly notices.

Report Concerning Aids.—Mariners are requested to submit to any Coast Guard unit, by radio or other prompt means, reports of any defects in aids, such as buoys out of position, lights extinguished, or signals not sounding, also recommendations as to establishment, improvement, or discontinuance of aids. It is unlawful to establish or maintain any aid similar to those maintained by the U.S. Coast Guard without first obtaining permission from the Commander, Ninth Coast Guard District, 1240 E Ninth Street, Cleveland, Ohio 44199. Applications should be submitted through the Cleveland District Office. The licensed officer in command of a vessel which collides with any aid must report the fact promptly through the office of the nearest Marine Inspection Officer in Charge, U.S. Coast Guard.

Marine Information Broadcasts.—Specific U.S. Coast Guard Stations make Marine Information Broadcasts, scheduled, safety, and urgent. The broadcast is announced on VHF-FM channel 16 (156.80 MHz) and immediately follows on VHF-FM channel 22 (157.10 MHz).

NATIONAL WEATHER SERVICE

Weather Service to Mariners.—The United States National Weather Service provides weather forecasts, warnings and weather bulletins for the benefit and safety of navigation on the Great Lakes. National Weather Service Warning Display Stations are described under their respective locations in the body of the text. The principal weather conditions are discussed briefly for each lake in the section devoted to that lake.

Weather Forecasts and Warnings.—Weather forecasts and warnings are issued at frequent intervals by National Weather Service Forecast Offices. (See appendix for list of offices and addresses.)

In addition to display of warnings when appropriate, all forecasts and warnings are broadcast over various radio stations to reach ships on the lakes. Marine Weather Services Charts showing the locations of all visual warning display stations and listing all broadcasts of Great Lakes weather forecasts and warnings on both marine wavelength and standard broadcast bands, may be purchased from Distribution Division (C44), National Ocean Survey, 6501 Lafayette Avenue, Riverdale, Md. 20840. Two charts are available, one (MSC-12) covering Lakes Ontario, Erie, and Huron (and the other (MSC-11) covering Lakes Michigan and Superior.

Weather Observation Program.—Many Great Lakes ships are equipped to take and report weather observations, which are then broadcast for the benefit of lake shipping over the same channels as weather forecasts and warnings. This service is supervised by the Marine Services Unit, National Weather Service Forecast Office, Cleveland Hopkins International Airport, Cleveland, Ohio 44135. Since 1960, all of the U.S. National Weather Service reporting vessels report in knots, and all wind velocity forecasts and the MAFOR and LAWEB bulletins are given in knots. (See page T-10 for mileage conversion table.)

St. Lawrence Seaway.—The St. Lawrence Seaway embraces waters of the St. Lawrence River above Montreal, Lake Ontario, the Welland Canal and eastern Lake Erie as far west as Long Point, and the St. Marys River.

The Seaway enables vessels to proceed from the Atlantic Ocean to the farthest inland major lake, Lake Superior. This is possible from the several locks in the Welland Canal and the St. Lawrence and St. Marys Rivers.

The **Saint Lawrence Seaway Development Corporation,** U.S. Department of Transportation, is responsible for the development, operation, and maintenance of that part of the Seaway between Montreal and Lake Erie, on the St. Lawrence River, which is within the territorial limits of the United States.

The Corporation headquarters is in Washington, D.C., and its operational field headquarters is in Massena, N.Y. (See appendix for addresses.)

The Corporation has a Canadian government agency counterpart, the St. Lawrence Seaway Authority (See St. Lawrence Seaway Authority, this chapter and appendix for addresses.)

The Seaway entities, the Corporation and the Authority, jointly publish the **Seaway Handbook** which contains Federal regulations issued by the respective governments and other information relating to operating requirements of vessels transiting the Seaway.

Both Seaway entities issue **Seaway Notices** containing aids to navigation changes and other information affecting the safety of navigation in the Seaway. The Seaway Notices are available at appropriate locks and canals and in the offices of the Seaway entities. In addition, such information is broadcast by the Seaway radio stations.

CANADIAN GOVERNMENT AGENCIES PROVIDING MARITIME SERVICES

Canadian Ministry of Transport.—Under the Canadian Ministry of Transport the Canadian Coast Guard publishes annually the Canadian Lists of Lights, Buoys and Fog Signals. Radio Aids to Marine Navigation (issued quarterly), Notice to Mariners, Radio Broadcast Notice to Mariners, and Notices to Shipping are also issued by the Ministry of Transport. (See appendix for addresses.)

Water Level Information is issued in various periodic bulletins by Ocean and Aquatic Sciences, Canadian De-

partment of Fisheries and the Environment, Burlington, Ontario. (See appendix for address.)

The **St. Lawrence Seaway Authority** (Canada) has cognizance over waters of the St. Lawrence Seaway other than those under the cognizance of the Saint Lawrence Seaway Development Corporation (U.S.). (See St. Lawrence Seaway and Saint Lawrence Seaway Development Corporation, this chapter and appendix for addresses.) The Authority issues Seaway Notices and Radio Broadcast Notices to Mariners.

Charts and related marine publications are produced and distributed by the Canadian Hydrographic Service, Department of Fisheries and the Environment. (See appendix for address.)

Canadian Sailing Directions for the Gulf and River St. Lawrence and for the Canadian waters of the Great Lakes are published by the Canadian Hydrographic Service, Department of Fisheries and the Environment, Ottawa, Ontario. (See appendix for address.)

Canadian Catalogue and Index to Nautical Charts and Related Publications of the Great Lakes and Adjacent Waterways (Information Bulletin 1) is available from the Hydrographic Chart Distribution Office, Department of Fisheries and the Environment, Ottawa, Ontario. (See appendix for address.) This bulletin lists nautical charts and related marine publications, their procurement source and price. This includes the Canadian Sailing Directions of the St. Lawrence River and Canadian waters of the Great Lakes in three volumes.

The Atmospheric Environment Service of the Canadian Department of Fisheries and the Environment issues forecasts and severe weather warnings for Lakes Ontario, Erie, Huron and Superior and for Georgian Bay. These forecasts are broadcast in code from Canadian Coast Guard marine radio stations. Broadcast schedules, content of broadcast, codes, etc. are contained in the publication "Radio Aids to Marine Navigation—Atlantic and Great Lakes" obtainable from the Publishing Centre, Supply and Services Canada, Ottawa, Ontario, K1A 0S9. These forecasts are also broadcast in plain language by many Canadian commercial radio stations.

Canadian ships equipped to take and report weather observations, including two year-round research vessels, number 71. In addition, eight lighthouse stations and three automatic reporting stations (MARS II) now take weather observations and provide reports during the shipping season. These are broadcast over the same radio channels as the weather forecasts. This service is supervised by the Atmospheric Environment Service, Department of Fisheries and the Environment, Downsview, Ontario. (See appendix for address.)

Canadian Customs Regulations.—Pleasure craft may enter Canada for a period of up to 12 months under a permit obtainable from Canadian Customs at the port of entry. For further information obtain a copy of "Border Crossing Information" from the Canadian Government Travel Bureau, Ottawa, Canada. Pleasure craft from Canada may enter the U.S.A. by obtaining a Cruising Permit Form from the Port Director at the U.S. port of entry (Immigration).

Canadian Customs regulations require that the first landing of a pleasure craft arriving in Canada from a place outside Canada shall be made at a Customs port, or designated place where Customs service is available.

On arrival it is the pleasure craft operator's responsibility to immediately report to Customs and to insure that all passengers and goods remain on board until Customs formalities have been completed.

It is to be noted, there is no fee assessed when a report is made at a Customs office during the hours of service listed for that particular location. However, a charge is made when service is requested beyond those hours.

The penalty for failure to report to Canadian Customs is quite severe. It is therefore suggested that when planning your boating trip you ensure you will arrive at your destination during those hours when Customs service is available. If in doubt as to your arrival time, plan to file your report at a designated office on your route of travel.

If you require information regarding Canadian Customs requirements or wish to comment on Canadian Customs services, please contact the Canadian Customs office most convenient to you or direct your communication to the national headquarters. (See appendix for list of Customs Offices and addresses.)

Canadian Code of Navigating Practices and Procedures.—A code of Navigating Practices and Procedures, which establishes a set of non-regulatory standards for the conduct of ships in Canadian waters and fishing zones has been issued by the Ministry of Transport.

The code is aimed at minimizing the incidence of ship collisions and groundings along Canadian shipping routes. Its provisions, if adhered to by ships' masters and officers, will ensure a high standard of efficiency and marine safety.

The code sets forth recommendations in such areas as navigation, operating and maintenance of navigation equipment and watchkeeping. It emphasizes the use of bridge-to-bridge VHF–FM radiotelephone communication and establishes standard procedures so that at appropriate times shipping will be aware of an individual vessel's location, its intended movements and any other facts relating to it that concern its own and other vessel's safety.

The code is primarily intended for observance by larger vessels.

Copies of the Code are available from Information Canada sales outlets and Canadian Hydrographic Service Agents.

Seaway Navigation Aids.—The numbered navigation aids in U.S. waters marking the main navigation channels of the Montreal/Lake Ontario section of the St. Lawrence Seaway from Seaway Lighted Buoy 1, near the mouth of the St. Regis River, to Seaway Lighted Buoy 245, at the head of the St. Lawrence River, inclusive, are operated and maintained by the Saint Lawrence Seaway Development Corporation. These aids are described in the Great Lakes Light List, published annually by the United States Coast Guard.

Buoys off station, lights extinguished or malfunctioning, and other defective conditions in U.S. waters of the Mon-

treal/Lake Ontario section of the St. Lawrence Seaway should be reported to the Vessel Traffic Controller, Eisenhower Lock, via "Seaway Eisenhower" and "Seaway Clayton" radio, Saint Lawrence Seaway Development Corporation, Massena, New York, or local Coast Guard unit, by radio or other prompt means.

REGULATIONS—STATE OF MICHIGAN—AFFECTING SMALL CRAFT NAVIGATION

AUTHORITY: Act No. 303, Public Acts of 1967, Michigan Compiled Laws.

It shall be unlawful for the operators of vessels used for recreational purposes to exceed a slow-no wake speed, which means a very slow speed whereby the wake or wash created by the vessel would be minimal.

Additional information and free copies of Act 303 are available from the State of Michigan, Department of Natural Resources, Marine Safety Section, Stevens T. Mason Building, Lansing, Michigan 48926 (Area code 517) 373-1650.

State of Michigan, Small-craft Harbors of Refuge.—The Michigan State Waterways Commission, in conjunction with local municipalities, has constructed a series of small-craft harbors of refuge along the Michigan shorelines. The harbors are usually no more than 20 miles apart except on Lake Superior where they may be as much as 40 miles apart. The harbors, most of which are manned during the summer and equipped with VHF-FM channel 16 (156.80 MHz), provide dockage and usually some services. These facilities are discussed in the text under **Harbor Facilities.**

THE COMPASS AND THE MAGNETISM OF THE EARTH IN THE LAKES REGION

It is proposed to treat here mainly of the guiding of a vessel by the magnetic compass, as affected by the difference between the direction of the needle and the true meridian, or true north, at various places. This difference is called the magnetic declination or variation of the compass, and is a matter that applies for all vessels alike, being external and part of the earth. Some points will be given herein on the earth's magnetism in the lake region necessary to an understanding of its action on the magnetic compass.

The effect of the variation is a matter of secondary importance to vessels as compared with the deflection of the compass needle caused by the iron and steel in machinery and hull, which latter is called the deviation of the compass. Investigation and adjustment of the deviation has to be specially made for each particular vessel. A merely nominal definition of deviation will be here given to distinguish it from variation.

Deviation of Compass.—The compass needle on board a vessel is under not only the influence of the nearly constant magnetism of the earth, but also the variable influence of any soft iron that may be around, as well as the nearly permanent magnetism of the steel hull of which the vessel may be built. The deflection of a compass needle from its normal direction for the region, due to the iron and steel in the vessel, is known as the deviation and may be very great owing to the nearness of the disturbing material to the needle.

This deviation is not a constant angle for all positions of the vessel. The magnetism of a needle is located principally at its poles near the ends. The effect of the steel hull on the needle in different bearings is analogous to the effect that would be produced by carrying a permanent magnet around the needle with the line from north to south pole of the magnet changing continuously in direction, or the north pole kept constantly directed to the center of the needle; while the effect of the soft iron, as the vessel turns, is the same as if a permanent magnet was carried around the needle with its north to south pole line always in the same direction parallel to the magnetic axis of the earth, the effect being due to magnetism induced by the earth.

The deviation of compass is usually counteracted in large measure by disposing small magnets around it in various positions and at some distance away, so that the compass needle points nearly north for a particular direction of the vessel. The remaining variable part of the deviation is ascertained by comparing the compass bearing of some object with the true magnetic bearing of the same object, when the vessel is heading in different directions around the horizon. The deviations from the true bearings are tabulated on a card for the various directions and applied as corrections to the courses sailed.

Magnetic Declination or Variation of Compass.—The magnetism of the earth causes a piece of magnetized steel to take a definite direction—which varies from place to place—when the steel is balanced on a point and free to turn, as in the case of the compass needle. The horizontal angle between the true meridian and the axis of the needle is called the magnetic declination, or more commonly by vessel men the variation of the compass. When the north end of the needle points east of the meridian the declination or variation is called easterly, and when it points west of the meridian it is called westerly.

The magnetic variation differs from place to place, and also changes at the same place from time to time. In the lake region the variation is 012° west at the east end of Lake Ontario, and at the west end of Lake Superior about 004° east. Over the interlying region it ranges between these two values except for irregularities of local attraction.

Compass Courses Corresponding to True Courses.—The courses given on the National Ocean Survey charts of the Great Lakes are true bearings from the astronomic meridian (reckoned clockwise from 000° at north). In sailing by the compass, allowance for the variation must be made in order to steer the true course. The angle of the compass needle from the true meridian has been accurately determined at numerous places on the shore around

the lakes and by shipboard observations on the lakes themselves. The results are shown graphically, on the National Ocean Survey's General Chart of the Great (Northern and Northwestern) Lakes, by lines joining the points of equal variation, for the full degrees from 016° west at Montreal to 004° east at Duluth. True azimuths of courses are converted to magnetic azimuths by adding the variation if westerly, or subtracting the variation if easterly.

Irregularities of Magnetic Declination or Variation, Called Local Attraction.—There are many minor irregularities in the distribution of the magnetic declination or variation, as shown by the devious courses of the lines of equal declination on the chart. At the exact point where the magnetic declination is observed, it is known with an accuracy of two or three minutes of arc. Another observation, however, at a point not very far away—a mile or so or even less—may give a declination differing by thirty minutes or more. This is owing to local sources of disturbance.

The direction of the magnetic needle at some places differs very much from the normal direction for the region. This is probably due to masses of magnetic iron ore, or rock strata containing iron, in the vicinity but out of sight, underground. Large irregularities of this kind are to be found on the north shore of Lake Superior, of such importance that a special investigation thereof was made by the former Duluth District, Corps of Engineers, the results being published under the Lake Superior **General Description—Magnetic Attraction** in this Pilot. At **Grand Marais, Minn.**, the variation changes within a short distance from 4° W. to 22° E. At **Corundum Point** there is a change from 5° W. to 17° E. At **Stony Point** there is a change of variation from 8° E. to 26° E. Other areas of large local disturbance are: Entrance to **Nipigon Strait**, west side of **Fluor Island**, and **St. Ignace Island**, variation 24° W.; a mile east of **Pic Island**, variation 21½° W.; **Rock of Ages**, west of Isle Royale, variation 9° E. At the south point of **Cockburn Island** in the north end of Lake Huron, near **Magnetic Reefs**, there is a considerable irregularity, the declination being 0°34′ E., while the normal for the vicinity is 6° W. Out on **East Reef**, however, the declination is about normal, being 7°23′ W. A very pronounced disturbance exists at **Kingston Harbor** on Lake Ontario, as fully described under that heading. With a normal variation of between 11° and 15° W. for that vicinity, the needle swings at one point to 30° W., and at another to 18° E., this range of about 48° occurring in a distance of 1¾ miles.

These large irregularities are along shore and do not extend out very far over the water, the declinations probably becoming normal three or four miles out. In deep water, any source of disturbance, being below the bottom of the lake, is not likely, unless very extensive, to have much effect on the needle at the surface, as the effect of the disturbing masses diminishes greatly with the increase of distance from the needle. Exceptional instances have, however, been noted on Lake Superior and Lake Ontario, as mentioned under head of General Description of each lake in this Pilot.

Changes of Magnetic Declination or Variation With Time.—Over the whole earth the magnetic needle is slowly changing, making a large swing in one direction through a certain arc, and then returning in the opposite direction, the time of the swing extending over a period of a great many years. The direction of the swing, as well as its period and the amount, varies considerably over the different parts of the earth.

There are no records of the direction of the needle in any part of the country covering the time of a whole swing of the needle forward and backward. At a few places, in some of the eastern States, there are records of the direction of needle covering the time of the movement one way, or over the half of a full swing. It is inferred from such records as exist that the time of a full swing or complete oscillation of the needle in the Lakes region is about 300 years. The extent of the swing—that is, the greatest excursion of the needle from east to west—is probably not more than 010°; but this, as well as the time of the swing, is very uncertain. The north end of the needle in the Lakes region was farthest east about the year 1800, since when it has moved westerly (the easterly variations decreasing and the westerly variations increasing), with a rate of change not entirely uniform and determined as ranging approximately from 0 to 6 minutes of arc annually.

Minor Oscillations of Compass Needle.—Besides the great oscillation of the magnetic needle of long period, there are minor oscillations of short period and small amount which have no important effect on the magnetic compass used by the navigator. The most pronounced of these disturbances occurs during infrequent magnetic storms, which are associated with auroras and sun spots; but the oscillation is of short duration and, in the Great Lakes region, seldom exceeds 1° in either direction from the normal variation.

MARINE EMERGENCY AND DISTRESS INFORMATION SHEET
U.S. COAST GUARD

Speak Slowly and Clearly—call:

1. If you are in DISTRESS (*i.e. when threatened by grave and imminent danger*), transmit the International Distress Call on 156.80 MHz—"MAYDAY MAYDAY MAYDAY THIS IS (*Your vessel's call sign and name repeated three times*)".*
2. If you need INFORMATION OR ASSISTANCE FROM THE COAST GUARD (*other than in a distress*), call COAST GUARD on 156.80 MHz (*the International Distress and Calling Frequency*).

*The Radiotelephone Alarm Signal (*if available*) should be transmitted prior to the Distress Call for approximately one minute. The Radiotelephone Alarm Signal consists of two audio tones, of different pitch, transmitted alternately. Its purpose is to attract the attention of persons on watch and shall only be used to announce that a distress call or message is about to follow.

If Aboard Vessel in Trouble—give:

1. WHO you are (*your vessel's call and name*).
2. WHERE you are (*your vessel's position in latitude/longitude or true bearing and distance in nautical miles from a widely known geographical point—local names known only in the immediate vicinity are confusing*).
3. WHAT is wrong (*nature of distress or difficulty, if not in distress*) Vessel's course and speed.
4. Kind of assistance desired.
5. Number of persons aboard and condition of any injured.
6. Present seaworthiness of your vessel.
7. Description of your vessel—length, type, cabin, masts, power, color of hull, superstructure, and trim.
8. Your listening frequency and schedule.

If Observing Another Vessel in Difficulty—give:

1. Your position and the bearing and distance of the vessel in difficulty.
2. Nature of distress or difficulty, if not in distress.
3. Description of the vessel in distress or difficulty, if not in distress (*see Item 7 above*).
4. Your intentions, course, and speed, etc.
5. Your radio call sign, name of your vessel, listening frequency, and schedule.

Helicopter Evacuation Checkoff List

Helicopter evacuation is a hazardous operation to the patient AND the plane crew, and should only be attempted when the life of the patient is gravely threatened. Provide the doctor with all the information you can concerning the patient so that an intelligent evaluation can be made concerning the need for air evacuation.

When Requesting Helicopter Assistance

1. Give accurate position, time, speed, course, weather conditions, wind direction and velocity, voice and CW frequencies.
2. If not provided, give COMPLETE medical information including whether or not patient is ambulatory.
3. If you are beyond helicopter range, advise your diversion intentions so that a rendezvous point may be selected.
4. If there are any changes in any items, advise immediately. Should the patient expire prior to arrival of the helicopter, be sure to advise.

Preparations Prior to Arrival of the Helicopter

1. Provide continuous radio guard on 156.80 MHz or specified VOICE frequency if possible. The helicopter cannot operate CW.
2. Select and clear most suitable hoist area, preferably aft, with a minimum 50-foot radius. This must include securing of loose gear, awnings, and antenna wires. Trice up running rigging and booms. If the hoist is aft, lower flagstaff.
3. If hoist is at night, light pickup areas as well as possible. Be sure you DO NOT SHINE ANY LIGHTS on the helicopter so the pilot is not blinded. If there are obstructions in the vicinity, put a light on them so the pilot will be aware of their positions.
4. Point searchlights vertically to aid in locating the ship, and secure them when helicopter is on scene.
5. Advise location of pickup area BEFORE the helicopter arrives so he may make his approach aft, amidships or forward, as required.
6. Remember, there will be a high noise level under the helicopter, making voice communication almost impossible. Arrange a set of hand signals among the crew who will assist.

Hoist Operations

1. If possible, move the patient to a position as close to the hoist area as his condition permits—TIME IS IMPORTANT.
2. Normally, if a litter is required, it will be necessary to move the patient to the special litter which will be lowered by the helicopter. Be prepared to do this as quickly as possible. Be sure patient is strapped in, face up, with life jacket, if his condition permits.
3. Be sure patient is tagged to indicate what medication, if any, was administered, and when.
4. Have patient's medical record and necessary papers in envelope or package ready for transfer with him.
5. Change course so the ship rides as easily as possible with the wind on the bow, preferably on the port bow. Try to choose a course to keep stack gases clear of hoist area.
6. Reduce speed to ease ship's motion but maintain steerageway.
7. If you do not have radio contact with helicopter, when you are in all respects ready for the hoist, signal the helicopter in with a "Come On" by hand, or by flashlight at night.
8. ALLOW BASKET OR STRETCHER TO TOUCH DECK PRIOR TO HANDLING TO AVOID STATIC SHOCK.
9. If a trail line is dropped by the helicopter, guide basket or stretcher to deck with line; keep line clear at all times.
10. Place patient in basket sitting with hands clear of sides, or in the litter, as described above. Signal helicopter hoist operator when ready for hoist. Patient signals by nodding head if he is able. Deck personnel give thumbs up.
11. If necessary to take litter away from hoist point, unhook hoist cable and keep free for helicopter to haul in. *DO NOT SECURE CABLE TO VESSEL OR ATTEMPT TO MOVE STRETCHER WITHOUT UNHOOKING.*
12. When patient is strapped in stretcher, signal helicopter to lower cable, hook up, and signal hoist operator when ready to hoist. Steady stretcher from swinging or turning.
13. If trail line is attached to basket or stretcher, use to steady. Keep feet clear of line.

SIGNALS TO BE USED BY AN AIRCRAFT IN DIRECTING A SURFACE CRAFT TO A VESSEL OR PLANE IN DISTRESS

The International signal for an aircraft that wants to direct a surface craft to a distress is: Circling the surface craft, opening and closing the throttle or changing propeller pitch (noticeable by change in sound) while crossing ahead of the surface craft, and proceeding in the direction of the distress. If you receive such a signal, you should follow the aircraft. If you cannot do so, try to inform the aircraft by any available means. If your assistance is no longer needed, the aircraft will cross your wake, opening and closing the throttle or changing propeller pitch. If you are radio equipped, you should attempt to communicate with the aircraft on 156.80 MHz when the aircraft makes the above signals or makes any obvious attempt to attract your attention. In the event that you cannot communicate by radio, be alert for a message block dropped from the aircraft.

Vessel Identification

1. For quick identification at night shine spotlights straight up.
2. If aircraft are involved, once you are identified, turn lights away so as not to blind aircraft crew.

Preparation for Towing

1. Have forecastle cleared.
2. If line-throwing gun is used, keep all personnel out of way until projectile clears boat.
3. Have material handy for chafing gear.
4. Secure tow line to bitt or crucifix.
5. Remove heaving line.

Operating CG Droppable Pumps

1. Make sure suction hose is tight—connect discharge hose.
2. Fill gas tank.
3. Pull stop switch away from spark plug.
4. Close carbureter choke—turn lever in direction of arrow.
5. Open throttle at base of engine.
6. Attach starting cord and spin engine.
7. After engine starts, open choke.
8. Normally, pumps are self-priming. If difficulty arises, prime.
9. When finished, flush out pump with fresh clean water.

NOTIFY THE COAST GUARD PROMPTLY AS SOON AS THE EMERGENCY TERMINATES

SIGNALS FOR THE OPENING OF DRAWBRIDGES

ACROSS VARIOUS HARBORS AND CHANNELS OF THE GREAT LAKES AND CONNECTING WATERS

LAKE ONTARIO

Rochester, N.Y.

Genesee River—ConRail RR, and Stutson Street highway: 1 long, 1 short (— —). If bridge cannot be opened, operator sounds 4 short blasts (— — — —) of whistle.

Toronto, Ontario

Keating Channel—Cherry Street: 2 long, 2 short (— — — —). Bridge whistle sounds same signal in return before opening and 2 short blasts (— —) before closing; if not ready to open, 3 short blasts (— — —) are sounded.

Ship Channel—Cherry Street: 1 long, 1 short, 1 long (— — —). Bridge whistle sounds same signal in return before opening and 2 short blasts (— —) before closing; if not ready to open, 3 short blasts (— — —) are sounded.

NIAGARA RIVER

Buffalo, N.Y.

Black Rock Canal—Ferry Street: 1 long, 2 short (— — —), answered from bridge; if unable to open, operator sounds 5 short (— — — — —); if disabled, red flags or red lights are displayed.

International railroad: 1 long (—). Signals from bridge: 1 long (—) on opening and 2 short (— —) when closed; 4 short (— — — —) when disabled, and at same time a red flag or red light is shown.

Tonawanda Harbor, N.Y.

Niagara River—Tonawanda Island: 3 blasts (— — —). Twenty-four hours advance notice to open, December 16 to March 31 and between 8 p.m. and 4 a.m., eastern standard time, April 1 to December 15, inclusive.

Tonawanda Creek—Railway: 3 blasts (— — —). Bridge stands open, except when switching cars. Twelve hours advance notice to open, December 16 to March 31.

LAKE ERIE

Buffalo, N.Y.

Buffalo River and Union Canal bridges: 3 blasts (— — —) Bridge tender changes semaphore signal to show green instead of red if bridge is to be opened; failure to change semaphore indicates bridge will not be immediately opened. Bridge engineer blows 1 blast of whistle before opening and 2 blasts before closing bridge.

Highway bridges remain closed as follows: Michigan Avenue Bridge from 7:30 a.m. to 9:00 a.m. and 4:00 p.m. to 5:45 p.m.; Ohio Street Bridge over Buffalo River from 7:30 to 9:00 a.m., and 4:00 p.m. to 5:45 p.m.; South Park Avenue Bridge over Buffalo River from 7 to 8:30 a.m. and from 4:30 to 6 p.m.; Bailey Avenue Bridge over Buffalo River remains closed from 6:30 to 7:30 a.m., and from 5 to 6 p.m.

Bridges across Niagara River and Black Rock Canal: See "Buffalo" in Niagara River list.

Ashtabula, Ohio

(See 33 C.F.R. § 117. 706a published in Rules and Regulations, following)

County highway (Fifth Street): Signal from vessels, 3 long (— — —). Return signals from bridge: 1 long (—) if bridge can be opened immediately; 5 short (— — — — —) if draw cannot be opened.

Penn Central (N.Y. Central) R.R. across channel to shipyard: Signal from vessels, 3 long (— — —). Return signals from bridge: 1 long (—) if bridge can be opened immediately, 5 short (— — — — —) if draw cannot be opened.

Cleveland, Ohio

Cuyahoga River—All bridges: 1 long, 2 short (— — —).

Old River—All bridges: 1 long, 1 short, 1 long, 1 short (— — — —).

At highway bridges a red ball for day use and a red light for night use are provided; when a vessel signals the red ball or red light is run up as a signal that the draw is to be opened, and is lowered as soon as the vessel has passed the draw; vessels must not attempt passage unless the red ball or light is up. At all movable bridges the vessel signal is answered with long and short signal given by synchronized whistle and light, and if bridge cannot be opened immediately three short check signals are given. (See Bridge Closure Hours under Structure Table—Cleveland Harbor, Ohio.)

Lorain, Ohio

Black River—Erie Avenue: 1 long, 2 short (— — —). N.Y., C. & St. L. RR. 1 long, 2 short (— — —). Each bridge answers with long and short signal given by synchronized whistle and light, and if draw cannot be opened immediately three short check signals are given.

Sandusky, Ohio

East Cove—March 16 to December 31, maintained in full open position except when closed for train to cross. January 1 to March 15, 24 hours notice required to have bridge opened.

Sandusky Bay—ConRail R.R., and Ohio Department of Highways: 3 long blasts (— — —). Acknowledged by 1 long blast of whistle or horn if bridge can be opened immediately, if not, by five short rapid blasts.

Port Clinton, Ohio

Portage River—Monroe Street: 1 long, 1 short (— —). Penn Central (N.Y. Central) RR: 3 long, 1 short (— — — —).

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Toledo, Ohio

Maumee River bridges: 3 long (— — —). Answered from bridge by 1 long and 1 short blast if draw is to be opened and the vessel shall acknowledge the bridge signal by 1 long and 1 short blast of a horn or whistle. Three short blasts from bridge indicate a temporary delay in opening. Five or more short blasts indicate danger, the bridge cannot open.

DETROIT RIVER

Detroit River, Mich.

Grosse Isle Bridge Co. highway toll bridge: Three blasts (— — —).

Wayne County highway, across channel from Trenton to Grosse Isle: 3 blasts (— — —). Immediately upon receipt of signal from a vessel approaching the bridge a flashing amber light is displayed to indicate receipt of signal; and as soon as the swing mechanism of the bridge is put into operation the horn signal indicating opening of the span is sounded.

Rouge River, Mich.

All bridges: 3 blasts (— — —). Bridge acknowledges vessel signal by 1 long blast if draw is ready to open; if not, the return signal is 5 short blasts, to be followed by 1 long blast when draw is to be opened.

ST. CLAIR RIVER

Marine City, Mich.

Belle River bridges: 3 blasts (— — —).

St. Clair, Mich.

Pine River bridge: 1 long, 1 short (— —). When draw can be opened immediately, same signal returned; if not, 4 or more short blasts in rapid succession, to be followed by 1 long, 1 short when draw can be opened. For accompanying visual signals and closed hours for certain bridges see 33 C.F.R. § 117.703 of Rules and Regulations following.

Port Huron, Mich.

Black River bridges: 1 long, 1 short (— —). When draw can be opened promptly, same signal returned; if not, or if bridge must be closed while open, four short blasts will be sounded. For hours of operation see 33 CFR 117.702, of Rules and Regulations following.

LAKE HURON

Saginaw River, Mich.

All bridges: 1 long, 1 short (— —). Answered from bridge by same signal if draw is to be opened promptly; if not, 4 or more short blasts are sounded, and repeated until acknowledged by vessel. For accompanying visual signals and closed hours for certain bridges see 33 C.F.R. § 117.700 of Rules and Regulations following.

Alpena, Mich.

Advance notice required to open bridge. See 33 C.F.R. § 117.697 of Rules and Regulations following.

Cheboygan, Mich., and Inland Route

Cheboygan River—U.S. 23 bridge: See 33 CFR 117.696 in Rules and Regulations following.

Crooked River—Village of Alanson: 3 blasts (— — —).

Little Current, Ontario

Manitoulin Island-Goat Island: (3 long (— — —).

Bridge operator replies with 1 long and 1 short blast of horn if bridge is to open; if not, 5 short blasts will be given. Vessel must wait for opening signal from bridge.

LAKE MICHIGAN

Charlevoix, Mich.

(See 33 C.F.R. § 117.690 published in Rules and Regulations, following)

Lower Channel—Highway: 1 long, 1 short (— —). Bell on bridge sounds return signal.

Upper Channel—Chesapeake & Ohio Railway: 1 long, 1 short (— —).

Grand River, Mich.

Grand Trunk Railway: 1 blast (—).

U.S. Highway 31 bridge: 1 long, 1 short (— —).

Railroad bridge across mouth of Spring Lake: 2 blasts (— —).

South Haven, Mich.

Black River highway: 3 long (— — —). Bell on bridge is sounded before opening draw.

St. Joseph, Mich.

St. Joseph River—Chesapeake & Ohio Railway and Main Street: From steamers, 2 short, 1 long (— — —); from sailing vessels, 3 long blasts of horn (— — —). Bell on highway bridge sounds return signal.

Michigan City, Ind.

Trail Creek (See 33 C.F.R. § 117.680 published in Rules and Regulations, following)—Highway Bridges: 3 blasts (— — —).

ConRail Railroad: 5 blasts (— — — — —).

This bridge will be operated between 6:30 a.m. and 2:30 p.m., daily except Sundays, from February 16 to December 14, inclusive, of each year. From December 15 to February 15, inclusive, on all Sundays, and between 2:30 p.m. and 6:30 a.m., on all other days, the bridge will not have a drawtender in constant attendance; however, during these periods, when a vessel, unable to pass under the closed bridge, desires to pass through the draw, the Chief Dispatcher, the Consolidated Rail Corporation, Chicago, Ill., shall be notified by telephone (collect). The Chief Dispatcher will make arrangements for the draw to be opened within 20 minutes after notification. A copy of regulations and notice stating

exactly how the Chief Dispatcher may be reached is required to be kept conspicuously posted on both the upstream and downstream sides of the bridge in such manner that it can easily be read at any time.

East Chicago, Ind.

Indiana Harbor Canal (See 33 C.F.R. § 117.676 published in Rules and Regulations, following)—All bridges: 1 long, 1 short, 1 long (— — —). At the five railroad bridges across the canal entrance, operator answers with long and short signal given by synchronized whistle and light if draw can be immediately opened; if not, 5 short check signals are given. Vessel will acknowledge by repeating each signal. Five or more short whistle blasts with light indicates danger; vessel must then slow to bare steerageway and, if necessary, reverse engines until appropriate further signals are given, answered, and understood.

Chicago, Ill.

Calumet River (See 33 C.F.R. § 117.670 published in Rules and Regulations, following)—All bridges: 3 short (— — —). Acknowledging signal lights consisting of alternate flashing red, amber and green lights are placed on the upstream and downstream sides of each bridge except at the five railroad bridges where one unit is placed on the upstream (lakeward) side of the B. & O. Railroad Bridge and the other on the downstream side of the southernmost Penn Central (Pennsylvania) Railroad Bridge. No vessel shall attempt to navigate the draw of a bridge until the green light or green flag signals are displayed.

Chicago River and Branches—All bridges (See 33 C.F.R. § 117.663 of Rules and Regulations, following): 3 short (— — —), except that 4 short (— — — —) are sounded for the Chicago & N.W. Ry. bridge at Kinzie Street and for the C., M., St. P. & PRR bridge at North Avenue when going either way, and 5 short (— — — — —) when approaching Lake Street Bridge from the north. A red flag by day or a red lantern at night is waved when bridge cannot be opened, and is displayed until bridge can be opened.

In order to minimize noises in the area bounded by Michigan Avenue Bridge on the east, Chicago Avenue Bridge on the north, and Roosevelt Road Bridge on the south, the city of Chicago requests that vessels give the customary signal for the first bridge approached within this area and, when in the bridge draw, inform the tender of their destination. The tender will then telephone ahead for the necessary bridge openings. Signals for other bridges should not be given unless prompt service is not provided.

One hour advance notice is required for opening bridges north of Chicago Avenue in the North Branch, except as stated in the Regulations.

Bridges remain closed during the hours below specified, except on Sundays, and except that bridges with less than 16 feet clearance above Chicago city datum shall open for harbor tugs at any time, except as local regulations stipulate.

Across Main River: From 7:30 to 10 a.m. and (except Saturday) from 4 to 6:30 p.m.; Saturday from 12:30 to 2 and 5 to 6 p.m. Outbound vessels which have passed Michigan Avenue Bridge prior to closing hours, morning or evening, may pass out to the lake.

Across South Branch and Forks: Between Lake Street and West Roosevelt Road, inclusive, same as for main river, above; thence to South Halsted Street, inclusive, from 7 to 8 a.m. and from 5 to 6 p.m.; all other bridges, from 7 to 8 a.m. and from 5:30 to 6:30 p.m.

Across North Branch: At West Kinzie Street, same as for main river, above; thence to North Halsted Street, inclusive, from 7 to 8 a.m. and from 5 to 6 p.m.; all other bridges, from 7 to 8 a.m. and from 5:30 to 6:30 p.m.

Across North Branch Canal: Chicago, Milwaukee, St. Paul & Pacific Railroad bridge at North Avenue will be closed from 12:01 a.m. to 8:01 a.m. each weekday and all day on Saturdays and Sundays. It will be necessary to telephone GR 7-2730 for an opening of the bridge during these times.

Racine, Wis.

(See 33 C.F.R. § 117.660 published in Rules and Regulations, following)

Root River bridges: Main Street, 1 long, 1 short (— —). State Street, 3 short (— — —).

Highway bridges may remain closed as follows: Main Street—7:30 a.m. to 8:10 a.m., 11:50 a.m. to 12:10 p.m., 12:50 p.m. to 1:10 p.m., 3:30 p.m. to 4:10 p.m., and 4:30 p.m. to 5:10 p.m.: State Street—6:30 a.m. to 7:00 a.m., 12:00 noon to 12:15 p.m. and 12:45 p.m. to 1:00 p.m. If draws cannot be opened promptly or are open and must be closed, the signal is 4 or more short blasts, (— — — —) or a red flag by day or a red light at night.

Milwaukee, Wis.

(See 33 C.F.R. § 117.655 published in Rules and Regulations, following)

All bridges across the Milwaukee, Menomonee, and Kinnickinnic Rivers, and the South Menomonee and Burnham Canals except as noted below, 3 shorts (— — —).

C., M., St. P. & PRR. and North Plankinton Avenue highway across Menomonee River, and Kinnickinnic Avenue highway and C. & N.W. Ry. (between Kinnickinnic Avenue and South First Street) across Kinnickinnic River: 4 short (— — — —).

A red ball elevated by day or the appearance of the red lights on top of bridge at night indicates that draw cannot be immediately opened. Bells at bridges acknowledge vessel signals but do not indicate passage.

All city highway bridges remain closed from 7:30 to 8:30 a.m. and 4:30 to 5:30 p.m. except to permit passage of vessels licensed to carry 50 or more passengers when proceeding to or from their regular landing places on their regular trips, vessels carrying United States mails, vessels belonging to the United States, and fireboats of the city of Milwaukee. The hours stated shall not apply on Sundays and legal holidays, consisting of New Year's Day, Washington's Birthday, Memorial Day, In-

dependence Day, Labor Day, Veterans Day, Thanksgiving Day, and Christmas Day, or on the Monday following such holidays when they occur on a Sunday.

Sheboygan, Wis.

Sheboygan River Eighth Street bridge (See 33 C.F.R. § 117.652 published in Rules and Regulations, following) : 1 long, 1 short (— —).

Manitowoc, Wis.

(See 33 C.F.R. § 117.650 published in Rules and Regulations, following)

Eighth Street: 3 blasts (— — —). Tenth Street and M, St. P. & S. Ste. M. Ry. (1st crossing) : 2 short, 1 long (— — —).

The two highway bridges remain closed from 6:50 to 7:00 a.m., 7:50 to 8:00 a.m., 11:55 a.m. to 12:10 p.m. and 12:45 to 1:00 p.m. If either cannot be opened. a red flag or ball by day or a red light at night is displayed.

Two Rivers, Wis.

Advance notice required to open bridges. See City Bridge Regulations and Signals under Two Rivers, Wis., text following.

Sturgeon Bay, Wis.

Sturgeon Bay bridges (See 33 C.F.R. § 117.645 published in Rules and Regulations, following) : 1 long, 1 short (— —). If bridge cannot be opened, 4 blasts (— — — —).

Green Bay Harbor, Wis.

Fox River railroad bridges and East River bridges: 3 long (— — —).

Fox River highway bridges: Main Street, 2 short, 1 long (— — —). Walnut Street, 1 long, 2 short (— — —). Mason Street, 1 long, 1 short, 1 long (— — —).

Fox River above De Pere: 3 distinct whistle (— — —) for all bridges except Main Street Bridge at Oshkosh for which the signal is 4 distinct whistles (— — — —).

A red ball by day, or a red light by night, is kept elevated above each bridge when closed and is lowered only when draw is to be opened in response to a vessel's signal.

City-owned bridges across Fox River at Main Street, Walnut Street, and Mason Street, except on Sundays and legal holidays, are not required to be opened from 7:45 to 8:00 a.m., from 12 noon to 12:15 p.m., from 12:50 to 1:10 p.m., and from 4:55 to 5:25 p.m., except for vessels carrying United States mails, vessels belonging to the United States. commercial vessels of 300 short tons or over cargo capacity and attendant towing tugs, and tugs or fire boats responding to emergency calls.

Highway bridge over East River at Monroe Avenue remains closed permanently. (Converted to fixed in 1969. See 33 C.F.R. § 117.644).

Manistee, Mich.

Manistee River—All bridges: 2 long, 1 short (— — —). Bells on bridges are sounded before opening draws.

ST. MARYS RIVER

Sault Ste. Marie, Mich. and Ontario

St. Marys Fall Canals, Mich.—Railway bridge—Bascule and lift spans: Ordinarily remain open; if found closed, vessels sound 3 blasts (— — —), answered by 1 long and 1 short blast of bridge horn before opening; but if bridge can not be opened immediately, horn sounds 5 short blasts and vessels shall stop until above opening signal is given. When closing both draws for passage of trains, horns on bascule sounds 1 blast, bridge closes, and horn then sounds 6 blasts, answered by 2 whistles from locomotive.

Sault Ste. Marie Canal, Ontario—Railway bridge: As request for opening draw if found closed, vessels sound 3 long blasts (— — —). Draw does not sound any whistle and its closure is indicated by an automatic semaphore.

LAKE SUPERIOR

Keweenaw Waterway, Mich.

Houghton-Hancock Bridge: 1 long, 2 short (— — —). Similar signal is given in return from the bridge, except that, when not ready to open, 5 short blasts (— — — — —) are sounded to indicate that vessel is to stop until regular return signal is given. The vessel shall acknowledge by sounding 5 short and rapid blasts.

Ontonagon, Mich.

Highway Bridge: 1 long, 1 short (— —).

Duluth-Superior Harbor, Minn. and Wis.

Duluth Ship Canal Bridge: 1 long, 1 short, 1 long, 1 short (— — — —). Bridge must give vessels right of way.

Northern Pacific Railway—Minnesota (North) draw: 1 long, 2 short (— — —). Wisconsin (South) draw: 2 long, 2 short (— — — —).

Grassy Point—Northern Pacific Railway: 2 short, 1 long (— — —).

Arrowhead (Twin Ports) : 3 long (— — —).

Similar signals are given in return from the drawbridges, except that, when not ready to open, 5 short blasts (— — — — —) are sounded to indicate that vessel is to stop until the regular return signal is given.

Thunder Bay (Fort William), Ontario

McKellar River—Canadian Pacific Railway bridge: 2 long, 1 short (— — —).

Kaministikwia River—Canadian Pacific Railway bridge: 2 long, 2 short (— — — —).

Canadian National Railway bridge (West Fort William): 2 long, 2 short (— — — —).

2. CERTAIN LAWS OF THE UNITED STATES

(U.S. CODE CITATIONS) ON NAVIGATION AND NAVIGABLE WATERS

EXTRACTS RELATING TO PRIVATE CONSTRUCTION IN NAVIGABLE WATERS, ESTABLISHMENT OF HARBOR LINES, CREATING OBSTRUCTIONS TO NAVIGATION, OCCUPANCY OR INJURY OF PUBLIC WORKS, MARKING AND REMOVAL OF WRECKS, BRIDGES OBSTRUCTING NAVIGATION AND REGULATIONS GOVERNING CANALS AND CHANNELS, DRAWBRIDGES, RAFTS AND LOGS, DUMPING, ETC., AS WELL AS DISCHARGE OF VESSEL WASTES.

a. Certain functions, powers and duties of the Department of the Army pertaining to the following laws, as set forth in this publication, have been transferred to the Secretary of the Department of Transportation by Public Law 89-670, Section 6(g):

(1) 33 U.S.C.A. 401—CONSTRUCTION OF BRIDGES, CAUSEWAYS, DAMS OR DIKES GENERALLY;

(2) 33 U.S.C.A. 471—ESTABLISHMENT BY SECRETARY OF THE ARMY OF ANCHORAGE GROUNDS AND REGULATIONS GENERALLY;

(3) 33 U.S.C.A. 491—APPROVAL OF AND DEVIATION FROM PLANS;

(4) 33 U.S.C.A. 494—OBSTRUCTION OF NAVIGATION; ALTERATIONS AND REMOVALS; LIGHTS AND SIGNALS; DRAWS; TOLLS;

(5) 33 U.S.C.A. 495—FAILURE TO COMPLY WITH REGULATIONS; PENALTY; REMOVAL OF BRIDGE; AND

(6) 33 U.S.C.A. 511—DEFINITIONS.

A. NAVIGABLE WATERS GENERALLY

33 U.S.C. 1—REGULATIONS BY SECRETARY OF THE ARMY FOR NAVIGATION OF WATERS GENERALLY. (From River and Harbor Acts of 18 August 1894 and 13 June 1902; as amended 8 August 1917)

It shall be the duty of the Secretary of the Army to prescribe such regulations for the use, administration, and navigation of the navigable waters of the United States as in his judgment the public necessity may require for the protection of life and property, or of operations of the United States in channel improvement, covering all matters not specifically delegated by law to some other executive department. Such regulations shall be posted, in conspicuous and appropriate places, for the information of the public; and every person and every corporation, which shall violate such regulations shall be deemed guilty of a misdemeanor and, on conviction thereof in any district court of the United States within whose territorial jurisdiction such offense may have been committed, shall be punished by a fine not exceeding $500, or by imprisonment (in the case of a natural person) not exceeding 6 months, in the discretion of the court.

Any regulations prescribed by the Secretary of the Army in pursuance of this section may be enforced as provided in section 418 of chapter 9 of this title, and provisions whereof are hereby made applicable to the said regulations.

33 U.S.C. 3—REGULATIONS TO PREVENT INJURIES FROM TARGET PRACTICE (Chapter XIX of Army Appropriation Act Approved 9 July 1918; as amended)

Authority to adopt regulations. In the interest of the national defense, and for the better protection of life and property on the navigable waters of the United States, the Secretary of the Army is authorized and empowered to prescribe such regulations as he may deem best for the use and navigation of any portion or area of the navigable waters of the United States or waters under the jurisdiction of the United States endangered or likely to be endangered by Coast Artillery fire in target practice or otherwise, or by the proving operations of the Government ordnance proving grounds at Sandy Hook, N.J., or at any Government ordnance proving ground that may be established elsewhere on or near such waters, and of any portion or area of said waters occupied by submarine mines, mine fields, submarine cables, or other material and accessories pertaining to seacoast fortifications, or by any plant or facility engaged in the execution of any public project of river and harbor improvement; and the said Secretary shall have like power to regulate the transportation of explosives upon any of said waters: *Provided,* That the authority hereby conferred shall be so exercised as not unreasonably to interfere with or restrict the food fishing industry, and the regulations prescribed in pursuance hereof shall provide for the use of such waters by food fishermen operating under permits granted by the Department of the Army.

Detail of vessels to enforce regulations. To enforce the regulations prescribed pursuant to this section, the Secretary of the Army may detail any public vessel in the service of the Department of the Army, or, upon the request of the Secretary of the Army, the head of any other department may enforce, and the head of any such department is hereby authorized to enforce such regulations by means of any public vessel of such department.

Posting and violation of regulations. The regulations made by the Secretary of the Army pursuant to this section shall be posted in conspicuous and appropriate places, designated by him, for the information of the public; and every person who and every corporation which shall willfully violate any regulations made by the said Secretary pursuant to this section shall be deemed guilty of a misdemeanor and upon conviction thereof in any court of competent jurisdiction shall be punished by a fine not exceeding $500, or by imprisonment (in the case of a natural person) not exceeding 6 months, in the discretion of the court.

Venue and jurisdiction of offenses; procedure. Offenses against the provisions of this section, or any regulation made pursuant thereto, committed in any Territory or other place subject to the Jurisdiction of the United States where there is no court having general jurisdiction of crimes against the United States, shall be cognizable in any court of such place or Territory having original jurisdiction of criminal cases in the place or Territory in which the offense has been committed with the

same right of appeal in all cases as is given in other criminal cases in the place or Territory in which the offense has been committed, with the same right of appeal in all cases as is given in other criminal cases where imprisonment not exceeding 6 months forms a part of the penalty, and jurisdiction is hereby conferred upon such courts and such courts shall exercise the same for such purposes; and in case any such offense be committed beyond the territorial jurisdiction of any court having jurisdiction thereof, the offense shall be deemed and held to have been committed within the jurisdiction in which the offender may be found or into which he is first brought, and shall be tried by the court having jurisdiction thereof.

B. PROTECTION OF NAVIGABLE WATERS AND RIVER AND HARBOR IMPROVEMENTS

33 U.S.C. 401*—CONSTRUCTION OF BRIDGES, CAUSEWAYS, DAMS OR DIKES GENERALLY (Section 9 of the River and Harbor Act Approved 3 March 1899; as amended)

It shall not be lawful to construct or commence the construction of any bridge, dam, dike, or causeway over or in any port, roadstead, haven, harbor, canal, navigable river, or other navigable water of the United States until the consent of Congress to the building of such structures shall have been obtained and until the plans for the same shall have been submitted to and approved by the Chief of Engineers and by the Secretary of the Army: *Provided,* That such structures may be built under authority of the legislature of a State across rivers and other waterways the navigable portions of which lie wholly within the limits of a single State, provided the location and plans thereof are submitted to and approved by the Chief of Engineers and by the Secretary of the Army before construction is commenced: *And provided further,* That when plans for any bridge or other structure have been approved by the Chief of Engineers and by the Secretary of the Army, it shall not be lawful to deviate from such plans either before or after completion of the structure unless the modification of said plans has previously been submitted to and received the approval of the Chief of Engineers and of the Secretary of the Army.

33 U.S.C. 403—OBSTRUCTION OF NAVIGABLE WATERS GENERALLY; WHARVES; PIERS; ETC.; EXCAVATIONS AND FILLING IN (Section 10 of the River and Harbor Act Approved 3 March 1899; as amended)

The creation of any obstruction not affirmatively authorized by Congress, to the navigable capacity of any of the waters of the United States is hereby prohibited; and it shall not be lawful to build or commence the building of any wharf, pier, dolphin, boom, weir, breakwater, bulkhead, jetty, or other structures in any port, roadstead, haven, harbor, canal, navigable river, or other water of the United States, outside established harbor lines, or where no harbor lines have been established, except on plans recommended by the Chief of Engineers and authorized by the Secretary of the Army; and it shall not be lawful to excavate or fill, or in any manner to alter or modify the course, location, condition, or capacity of, any port, roadstead, haven, harbor, canal, lake, harbor of refuge, or inclosure within the limits of any breakwater, or of the channel of any navigable water of the United States, unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of the Army prior to beginning the same.

*The functions, powers and duties of the Secretary of the Army and other offices and officers of the Department of the Army are transferred to the Secretary of the Department of Transportation to the extent that they relate generally to the location and clearances of bridges and causeways in the navigable waters of the United States.

33 U.S.C. 404—ESTABLISHMENT OF HARBOR LINES; CONDITIONS TO GRANT FOR EXTENSION OF PIERS, ETC. (Section 11 of the River and Harbor Act Approved 3 March 1899; as amended)

Where it is made manifest to the Secretary of the Army that the establishment of harbor lines is essential to the preservation and protection of harbors he may, and is hereby authorized, to cause such lines to be established, beyond which no piers, wharves, bulkheads, or other works shall be extended or deposits made, except under such regulations as may be prescribed from time to time by him: *Provided,* That whenever the Secretary of the Army grants to any person or persons permission to extend piers, wharves, bulkheads, or other works, or to make deposits in any tidal harbor or river of the United States, he shall cause to be ascertained the amount of tidewater displaced by any such structure or by any such deposits, and he shall, if he deem it necessary, require the parties to whom the permission is given to make compensation for such displacement either by excavating in some part of the harbor, including tidewater channels between high and low water mark, to such an extent as to create a basin for as much tidewater as may be displaced by such structure or by such deposits, or in any other mode that may be satisfactory to him.

33 U.S.C. 406—PENALTY FOR WRONGFUL CONSTRUCTION OF BRIDGES, PIERS, ETC.; REMOVAL OF STRUCTURES (Section 12 of the River and Harbor Act Approved 3 March 1899; as amended)

Every person and every corporation that shall violate any of the provisions of sections 401, 403, and 404 of this chapter, or any rule or regulation made by the Secretary of the Army in pursuance of the provisions of the said sections, shall be deemed guilty of a misdemeanor, and on conviction thereof, shall be punished by a fine not exceeding $2,500 nor less than $500, or by imprisonment (in the case of a natural person) not exceeding one year, or by both such punishments, in the discretion of the court. And further, the removal of any structures or parts of structures erected in violation of the provisions of the said sections may be enforced by the injunction of any district court exercising jurisdiction in any district in which such structures may exist, and proper proceedings to this end may be instituted under the direction of the Attorney General of the United States.

33 U.S.C. 407—DEPOSIT OF REFUSE IN NAVIGABLE WATERS GENERALLY (Section 13 of the River and Harbor Act Approved 3 March 1899; as amended)

It shall not be lawful to throw, discharge, or deposit, or cause, suffer, or procure to be thrown, discharged, or deposited either from out of any ship, barge, or other floating craft of any kind, or from the shore, wharf, manufacturing establishment or mill of any kind, any refuse matter of any kind of description whatever other than that flowing from streets and sewers and passing therefrom in a liquid state, into any navigable water of the United States, or into any tributary of any navigable water from which the same shall float or be washed into such navigable water; and it shall not be lawful to deposit, or cause, suffer, or procure to be deposited material of any kind in any place on the bank of any navigable water, or on the bank of any tributary of any navigable water, where the same shall be liable to be washed into such navigable water, either by ordinary or high tides, or by storms or floods, or otherwise, whereby navigation shall or may be impeded or obstructed: *Provided,* That nothing herein contained shall extend to, apply to, or prohibit the operations in connection with the improvement of navigable waters or construction of public works, considered necessary and proper by the United States officers supervising such improvement or public work: *And provided further,* That the Secretary of the Army whenever, in the judgment of the Chief of Engineers, anchorage and navigation will not be injured thereby, may permit

the deposit of any material above mentioned in navigable waters, within limits to be defined and under conditions to be prescribed by him, provided application is made to him prior to depositing such material; and whenever any permit is so granted the conditions thereof shall be strictly complied with, and any violation thereof shall be unlawful.

Note: Oil discharged from vessel into navigable water of the United States held "refuse matter" within above statute and hence vessel committing such offense was liable for penalty provided by statute. (L. A. Merced. Circuit Court Appeals, Washington, 84 Fed. 2nd 444)

33 U.S.C. 407a—DEPOSIT OF DEBRIS OF MINES AND STAMP WORKS (From River and Harbor Act Approved 5 August 1886; as amended)

In places where harborlines have not been established, and where deposits of debris of mines or stamp works can be made without injury to navigation, within lines to be established by the Secretary of the Army, said officer may, and is hereby authorized to, cause such lines to be established; and within such lines such deposits may be made, under regulations to be from time to time prescribed by him.

33 U.S.C. 408—TAKING POSSESSION OF, USE OF, OR INJURY TO HARBOR OR RIVER IMPROVEMENTS (Section 14 of the River and Harbor Act Approved 3 March 1899; as amended)

It shall not be lawful for any persons to take possession of or make use of for any purpose, or build upon, alter, deface, destroy, move, injure, obstruct by fastening vessels thereto or otherwise, or in any manner whatever impair the usefulness of any sea wall, bulkhead, jetty, dike, levee, wharf, pier, or other work built by the United States, or any piece of plant, floating or otherwise, used in the construction of such work under the control of the United States, in whole or in part, for the preservation and improvement of any of its navigable waters or to prevent floods, or as boundary marks, tide gages, surveying stations, buoys, or other established marks, nor remove for ballast or other purposes any stone or other material composing such works: *Provided,* That the Secretary of the Army, on the recommendation of the Chief of Engineers, grant permission for the temporary occupation or use of any of the aforementioned public works when in his judgment such occupation or use will not be injurious to the public interest.

33 U.S.C 409—OBSTRUCTION OF NAVIGABLE WATERS BY VESSELS; FLOATING TIMBER; MARKING AND REMOVAL OF SUNKEN VESSELS (Section 15 of the River and Harbor Act Approved 3 March 1899; as amended)

It shall not be lawful to tie up or anchor vessels or other craft in navigable channels in such a manner as to prevent or obstruct the passage of other vessels or craft; or to voluntarily or carelessly sink, or permit or cause to be sunk, vessels or other craft in navigable channels; or to float loose timber and logs, or to float what is known as sack rafts of timber and logs in streams or channels actually navigated by steamboats in such manner as to obstruct, impede, or endanger navigation. And whenever a vessel, raft, or other craft is wrecked and sunk in a navigable channel, accidently or otherwise, it shall be the duty of the owner of such sunken craft to immediately mark it with a buoy or beacon during the day and alighted lantern at night, and to maintain such marks until the sunken craft is removed or abandoned, and the neglect or failure of the said owner so to do shall be unlawful; and it shall be the duty of the owner of such sunken craft to commence the immediate removal of the same, and prosecute such removal diligently, and failure to do so shall be considered as an abandonment of such craft, and subject to the same removal by the United States as hereinafter provided for.

33 U.S.C. 410—EXCEPTION AS TO FLOATING LOOSE TIMBER, SACK RAFTS, ETC.; VIOLATION OF REGULATIONS; PENALTY (From Act Approved 9 May 1900; as amended)

The prohibition contained in the foregoing section against floating loose timber and logs, or sack rafts, so called, of timber and logs in streams or channels actually navigated by steamboats, shall not apply to any navigable river or waterway of the United States or any part thereof whereon the floating of loose timber and logs and sack rafts of timber and logs is the principle method of navigation. But such method of navigation on such river or waterway or part thereof shall be subject to the rules and regulations prescribed by the Secretary of the Army as hereinafter provided.

The Secretary of the Army shall have power, and he is hereby authorized and directed to prescribe rules and regulations, which he may at any time modify, to govern and regulate the floating of loose timber and logs, and sack rafts (so called) of timber and logs and other methods of navigation on the streams and waterways, or any thereof, of the character, as to navigation, heretofore in this section described. The said rules and regulations shall be so framed as to equitably adjust conflicting interests between the different methods or forms of navigation; and the said rules and regulations shall be published at least once in such newspaper or newspapers of general circulation as in the opinion of the Secretary of the Army shall be best adapted to give notice of said rules and regulations to persons affected thereby and locally interested therein. And all modifications of said rules and regulations when so prescribed and published as to any such stream or waterway shall have the force of law, and any violation thereof shall be a misdemeanor, and every person convicted of such violation shall be punished by a fine of not exceeding $2,500 nor less than $500, or by imprisonment (in case of a natural person) for not less than 30 days nor more than one year, or by both such fine and imprisonment, in the discretion of the court: *Provided,* That the proper action to enforce the provisions of this section may be commenced before any commissioner, judge, or court of the United States, and such commissioner, judge, or court shall proceed in respect thereto as authorized by law in the case of crimes or misdemeanors committed against the United States.

33 U.S.C. 411—PENALTY FOR WRONGFUL DEPOSIT OF REFUSE; USE OF OR INJURY TO HARBOR IMPROVEMENTS AND OBSTRUCTION OF NAVIGABLE WATERS GENERALLY (Section 16 of the River and Harbor Act Approved 3 March 1899; as amended)

Every person and every corporation that shall violate, or that shall knowingly aid, abet, authorize, or instigate a violation of the provisions of sections 407, 408, and 409 of this chapter shall be guilty of a misdemeanor, and on conviction thereof shall be punished by a fine not exceeding $2,500 nor less than $500, or by imprisonment (in the case of a natural person for not less than 30 days nor more than one year, or by both such fine and imprisonment, in the discretion of the court, one-half of said fine to be paid to the person or persons giving information which shall lead to convictions.

33 U.S.C. 412—LIABILITY OF MASTERS, PILOTS, AND SO FORTH, AND OF VESSELS ENGAGED IN VIOLATIONS (Section 16 of the River and Harbor Act Approved 3 March 1899; as amended)

Any and every master, pilot, and engineer, or person or persons acting in such capacity, respectively, on board of any boat or vessel who shall knowingly engage in towing any scow, boat, or vessel loaded with any material specified in section 407 of this title to any point or place of deposit or discharge in any harbor or navigable water, elsewhere than within the limits defined and permitted by the Secretary of the Army, or who shall willfully

injure or destroy any work of the United States contemplated in section 408 of this title, or who shall willfully obstruct the channel of any waterway in the manner contemplated in sections 401, 403, 404, 406, 407, 408, 409, 411–416, 418, 502, 549, 686, 687 of this title, and shall upon conviction be punished as provided in section 411 of this title, and shall also have his license revoked or suspended for a term to be fixed by the judge before whom tried and convicted. And any boat, vessel, scow, raft, or other craft used or employed in violating any of the provisions of sections 407, 408, and 409 of this title shall be liable for the pecuniary penalties specified in section 411 of this title, and in addition thereto for the amount of the damages done by said boat, vessel, scow, raft, or other craft, which latter sum shall be placed to the credit of the appropriation for the improvement of the harbor or waterway in which the damage occurred, and said boat, vessel, scow, raft, or other craft may be proceeded against summarily by way of libel in any district court of the United States having jurisdiction thereof.

33 U.S.C. 413—DUTY OF DISTRICT ATTORNEYS AND OTHER FEDERAL OFFICERS IN ENFORCEMENT OF PROVISIONS; ARREST OF OFFENDERS (Section 17 of the River and Harbor Act Approved 3 March 1899; as amended)

The Department of Justice shall conduct the legal proceedings necessary to enforce the foregoing provisions of the foregoing sections of this chapter; and it shall be the duty of district attorneys of the United States to vigorously prosecute all offenders against the same whenever requested to do so by the Secretary of the Army or by any of the officials hereinafter designated, and it shall furthermore be the duty of said district attorneys to report to the Attorney General of the United States the action taken by him against offenders so reported, and a transcript of such reports shall be transmitted to the Secretary of the Army by the Attorney General; and for the better enforcement of the said provisions and to facilitate the detection and bringing to punishment of such offenders, the officers and agents of the United States in charge of river and harbor improvements, and the assistant engineers and inspectors employed under them by authority of the Secretary of the Army, and the United States collectors of customs and other revenue officers shall have power and authority to swear out process, and to arrest and take into custody, with or without process, any person or persons who may commit any of the acts or offenses prohibited by the aforesaid sections of this chapter, or who may violate any of the provisions of the same: *Provided,* That no person shall be arrested without process for any offense not committed in the presence of some one of the aforesaid officials: *And provided further,* That whenever any arrest is made under the foregoing provisions of this chapter, the person so arrested shall be brought forthwith before a commissioner, judge, or court of the United States for examination of the offenses alleged against him; and such commissioner, judge, or court shall proceed in respect thereto as authorized by law in case of crimes against the United States.

33 U.S.C. 414—REMOVAL BY SECRETARY OF SUNKEN WATER CRAFT GENERALLY (Section 19 of the River and Harbor Act Approved 3 March 1899; as amended)

Whenever the navigation of any river, lake, harbor, sound, bay, canal, or other navigable waters of the United States shall be obstructed or endangered by any sunken vessel, boat, water craft, raft, or other similar obstruction, and such obstruction has existed for a longer period than thirty days, or whenever the abandonment of such obstruction can be legally established in a less space of time, the sunken vessel, boat, water craft, raft, or other obstruction shall be subject to be broken up, removed, sold, or otherwise disposed of by the Secretary of the Army at his discretion, without liability for any damage to the owners of the same: *Provided,* That in his discretion, the Secretary of the Army may cause reasonable notice of such obstruction of not less than thirty days, unless the legal abandonment of the obstruction can be established in a less time, to be given by publication, addressed "To whom it may concern," in a newspaper published nearest to the locality of the obstruction, requiring the removal thereof: *And provided also,* That the Secretary of the Army, in his discretion, at or after the time of giving such notice, cause sealed proposals to be solicited by public advertisement, giving reasonable notice of not less than ten days, for the removal of such obstruction as soon as possible after the expiration of the above specified thirty days' notice, in case it has not in the meantime been so removed, these proposals and contracts, at his discretion, to be conditioned that such vessel, boat, water craft, raft, or other obstruction, and all cargo and property contained therein, shall become the property of the contractor, and the contract shall be awarded to the bidder making the proposition most advantageous to the United States: *Provided,* That such bidder shall give satisfactory security to execute the work: *Provided further,* That any money received from the sale of any such wreck, or from any contractor for the removal of wrecks, under this paragraph shall be covered into the Treasury of the United States.

33 U.S.C. 415—SUMMARY REMOVAL OF WATER CRAFT OBSTRUCTING NAVIGATION (Section 20 of the River and Harbor Act Approved 3 March 1899; as amended)

Under emergency, in the case of any vessel, boat, water craft, or raft, or other similar obstruction, sinking or grounding, or being unnecessarily delayed in any Government canal or lock, or in any navigable waters mentioned in the foregoing section, in such manner as to stop, seriously interfere with, or specially endanger navigation, in the opinion of the Secretary of the Army, or any agent of the United States to whom the Secretary may delegate proper authority, the Secretary of the Army or any such agent shall have the right to take immediate possession of such boat, vessel, or other water craft, or raft, so far as to remove or to destroy it and to clear immediately the canal, lock, or navigable waters aforesaid of the obstruction thereby caused, using his best judgment to prevent any unnecessary injury; and no one shall interfere with or prevent such removal or destruction; *Provided,* That the officer or agent charged with the removal or destruction of an obstruction under this section may in his discretion give notice in writing to the owners of any such obstruction requiring them to remove it: *And provided further,* That the expense of removing any such obstruction as aforesaid shall be a charge against such craft and cargo; and if the owners thereof fail or refuse to reimburse the United States for such expense within thirty days after notification, then the officer or agent aforesaid may sell the craft or cargo, or any part thereof that may not have been destroyed in removal, and the proceeds of such sale shall be covered into the Treasury of the United States.

33 U.S.C. 419—REGULATION BY SECRETARY GOVERNING TRANSPORTATION AND DUMPING OF DREDGINGS, REFUSE, ETC., INTO NAVIGABLE WATERS; OYSTER LANDS; APPROPRIATIONS (Section 4 of the River and Harbor Act Approved 3 March 1905; as amended)

The Secretary of the Army is authorized and empowered to prescribe regulations to govern the transportation and dumping into any navigable water, or waters adjacent thereto, of dredgings, earth, garbage, and other refuse materials of every kind or description, whenever in his judgment such regulations are required in the interest of navigation. Such regulations shall be posted in conspicuous and appropriate places for the information of the public; and every person or corporation which shall violate the said regulations, or any of them, shall be deemed guilty of a misdemeanor and shall be subject to the penalties prescribed in sections 411 and 412 of this chapter, for violation of the provisions of section 407 of this chapter: *Provided,* That any regula-

tions made in pursuance hereof may be enforced as provided in section 413 of this chapter, the provisions whereof are hereby made applicable to the said regulations: *Provided further,* That this section shall not apply to any waters within the jurisdictional boundaries of any State which are now or may hereafter be used for the cultivation of oysters under the laws of such State, except navigable channels which have been or may hereafter be improved by the United States, or to be designated as navigable channels by competent authority, and in making such improvements of channels, the material dredged shall not be deposited upon any ground in use in accordance with the laws of such State for the cultivation of oysters, except in compliance with said laws: *And provided further,* That any expense necessary in executing this section may be paid from funds available for the improvement of the harbor or waterway, for which regulations may be prescribed, and in case no such funds are available the said expense may be paid from appropriations made by Congress for examinations, surveys, and contingencies of rivers and harbors.

33 U.S.C. 421—DEPOSIT OF REFUSE, ETC., IN LAKE MICHIGAN NEAR CHICAGO

It shall not be lawful to throw, discharge, dump, or deposit, or cause, suffer, or procure, to be thrown, discharged, dumped, or deposited, any refuse matter of any kind or description whatever other than that flowing from streets and sewers and passing therefrom in a liquid state into Lake Michigan, at any point opposite or in front of the county of Cook, in the State of Illinois, or the county of Lake in the State of Indiana, within eight miles from the shore of said lake, unless said material shall be placed inside of a breakwater so arranged as not to permit the escape of such refuse material into the body of the lake and cause contamination thereof: and no officer of the Government shall dump or cause or authorize to be dumped any material contrary to the provisions of this section: *Provided, however,* That the provisions of this section shall not apply to work in connection with the construction, repair, and protection of breakwaters and other structures built in aid of navigation, or for the purpose of obtaining water supply. Any person violating any provision of this section shall be guilty of a misdemeanor, and on conviction thereof shall be fined for each offense not exceeding $1,000. (June 23, 1910, c. 359.36 Stat. 593.)

C. ANCHORAGE GROUNDS AND HARBOR REGULATIONS

33. U.S.C. 471†—ESTABLISHMENT BY SECRETARY OF THE ARMY OF ANCHORAGE GROUNDS AND REGULATIONS GENERALLY (From Section 7 of the River and Harbor Act Approved 4 March 1915; as amended)

The Secretary of the Army is authorized, empowered, and directed to define and establish anchorage grounds for vessels in all harbors, rivers, bays, and other navigable waters of the United States whenever it is manifest to the said Secretary that the maritime or commercial interests of the United States require such anchorage grounds for safe navigation and the establishment of such anchorage grounds shall have been recommended by the Chief of Engineers, and to adopt suitable rules and regulations in relation thereto; and such rules and regulations shall be enforced by the Coast Guard under the direction of the Secretary of the Treasury: *Provided,* That at ports or places where there is no Coast Guard vessel available such rules and regulations may be enforced by the Chief of Engineers under the direction of the Secretary of the Army. In the event of the violation of any such rules and regulations by the owner, master, or person in charge of any vessel, such owner, master, or person in charge of such vessel shall be liable to a penalty of $100; and the said vessel may be holden for the payment of such penalty, and may be seized and proceeded against summarily by libel for the recovery of the same in any United States district court for the district within which such vessel may be and in the name of the officer designated by the Secretary of the Army.

†All functions, powers and duties of the Secretary of the Army and other offices and officers of the Department of the Army are transferred to the Secretary of the Department of Transportation.

33 U.S.C. 474—ANCHORAGE AND GENERAL REGULATIONS FOR SAINT MARYS RIVER

The Commandant of the Coast Guard is authorized and directed to adopt and prescribe suitable rules and regulations governing the movements and anchorage of vessels and rafts in Saint Marys River from Point Iroquois, on Lake Superior, to Point Detour, on Lake Huron, and for the purpose of enforcing the observance of such regulations the Secretary of the Treasury is authorized to detail one or more Coast Guard cutters for duty upon the request of the Commandant of the Coast Guard on said river.

All officers of the Coast Guard who are directed to enforce the regulations prescribed by the above rules are empowered and directed, in case of necessity, or when a proper notice has been disregarded, to use the force at their command to remove from channels or stop any vessel found violating the prescribed rules.

In the event of the violation of any such regulations or rules of the Commandant of the Coast Guard by the owners, master, or person in charge of such vessel, such owners, master, or person in charge shall be liable to a penalty not exceeding $200: *Provided,* That the Commandant of the Coast Guard may remit said fine on such terms as he may prescribe: *Provided also,* That nothing in this section shall be construed to amend or repeal chapter 4 of this title regulating navigation on the Great Lakes and their connecting and tributary waters as far east as Montreal.

D. BRIDGES OVER NAVIGABLE WATERS

33 U.S.C. 491*—APPROVAL OF AND DEVIATION FROM PLANS (Section 1 of the Bridge Act Approved 23 March 1906; as amended)

When, after March 23, 1906, authority is granted by Congress to any persons to construct and maintain a bridge across or over any of the navigable waters of the United States, such bridge shall not be built or commenced until the plans and specifications for its construction, together with such drawings of the proposed construction and such map of the proposed location as may be required for a full understanding of the subject, have been submitted to the Secretary of the Army and Chief of Engineers for their approval, nor until they shall have approved such plans and specifications and the location of such bridge and accessory works; and when the plans for any bridge to be constructed under the provisions of this chapter, sections 491 to 498, inclusive, have been approved by the Chief of Engineers and by the Secretary of the Army it shall not be lawful to deviate from such plans, either before or after completion of the structure, unless the modification of such plans has previously been submitted to and received the approval of the Chief of Engineers and of the Secretary of the Army.

33 U.S.C. 494*—OBSTRUCTION OF NAVIGATION; ALTERATIONS AND REMOVALS; LIGHTS AND SIGNALS: DRAWS; TOLLS (Section 4 of the Bridge Act Approved 23 March 1906; as amended)

No bridge erected or maintained under the provisions of this chapter, section 491 to 498, inclusive, shall at any time un-

*The functions, powers and duties of the Secretary of the Army and other offices and officers of the Department of the Army are transferred to the Secretary of the Department of Transportation to the extent that they relate generally to the location and clearances of bridges and causeways in the navigable waters of the United States.

reasonably obstruct the free navigation of the waters over which it is constructed, and if any bridge erected in accordance with the provisions of this chapter, sections 491 to 498, inclusive, shall, in the opinion of the Secretary of the Army, at any time unreasonably obstruct such navigation, either on account of insufficient height, width of span, or otherwise, or if there be difficulty in passing the draw opening or the drawspan of such bridge by rafts, steamboats, or other water craft, it shall be the duty of the Secretary of the Army, after giving the parties interested reasonable opportunity to be heard, to notify the persons owning or controlling such bridge to so alter the same as to render navigation through or under it reasonably free, easy, and unobstructed, stating in such notice the changes required to be made, and prescribing in each case a reasonable time in which to make such changes, and if at the end of the time so specified the changes so required have not been made, the persons owning or controlling such bridge shall be deemed guilty of a violation of this chapter, sections 491 to 498, inclusive; and all such alterations shall be made and all such obstructions shall be removed at the expense of the persons owning or operating said bridge. The persons owning or operating any such bridge shall maintain, at their own expense, such lights and other signals thereon as the Commandant of the Coast Guard shall prescribe. If the bridge shall be constructed with a draw, then the draw shall be opened promptly by the persons owning or operating such bridge upon reasonable signal for the passage of boats and other water craft. If tolls shall be charged for the transit over any bridge constructed under the provisions of this chapter, sections 491 to 498, inclusive, of engines, cars, streetcars, wagons, carriages, vehicles, animals, foot passengers or other passengers, such tolls shall be reasonable and just, and the Secretary of the Army, at any time, and from time to time, prescribe the reasonable rates of toll for such transit over such bridge, and the rates so prescribed shall be the legal rates and shall be the rates demanded and received for such transit.

33 U.S.C. 495*—FAILURE TO COMPLY WITH REGULATIONS; PENALTY; REMOVAL OF BRIDGE (Section 5 of the Bridge Act Approved 23 March 1906; as amended)

Any persons who shall fail or refuse to comply with the lawful order of the Secretary of the Army or the Chief of Engineers, made in accordance with the provisions of this chapter, sections 491 to 498, inclusive, shall be deemed guilty of a violation of this chapter, sections 491 to 498, inclusive, and any persons who shall be guilty of a violation of this chapter, sections 491 to 498, inclusive, shall be deemed guilty of a misdemeanor and on conviction thereof shall be punished in any court of competent jurisdiction by a fine not exceeding $5,000, and every month such persons shall remain in default shall be deemed a new offense and subject such persons to additional penalties therefor; and in addition to the penalties above described the Secretary of the Army and the Chief of Engineers may, upon refusal of the persons owning or controlling any such bridge and accessory works to comply with any lawful order issued by the Secretary of the Army or Chief of Engineers in regard thereto, cause the removal of such bridge and accessory works at the expense of the persons owning or controlling such bridge, and suit for such expense may be brought in the name of the United States against such persons, and recovery had for such expense in any court of competent jurisdiction; and the removal of any structures erected or maintained in violation of the provisions of this chapter, sections 491 to 498, inclusive, or the order or direction of the Secretary of the Army or Chief of Engineers made in pursuance thereof may be enforced by injunction, mandamus, or other summary process, upon application to the district court in the district in which such structure may, in whole or in part, exist, and proper proceedings to this end may be instituted under the direction of the Attorney General of the United States at the request of the Secretary of the Army; and in case of any litigation arising from any obstruction or alleged obstruction to navigation created by the construction of any bridge under this chapter, sections 491 to 498, inclusive, the cause or question arising may be tried before the district court of the United States in any district which any portion of said obstruction or bridge touches.

*The functions, powers and duties of the Secretary of the Army and other offices and officers of the Department of the Army are transferred to the Secretary of the Department of Transportation to the extent that they relate generally to the location and clearances of bridges and causeways in the navigable waters of the United States.

33 U.S.C. 496—TIME FOR COMMENCEMENT AND COMPLETION OF BRIDGE (Section 6 of the Bridge Act Approved 23 March 1906; as amended)

Whenever Congress shall by law authorize the construction of any bridge over or across any of the navigable waters of the United States, and no time for the commencement and completion of such bridge is named in said Act, the authority thereby granted shall cease and be null and void unless the actual construction of the bridge authorized in such Act be commenced within one year and completed within three years from the date of the passage of such Act.

33 U.S.C. 497—"PERSONS" DEFINED (Section 7 of the Bridge Act Approved 23 March 1906; as amended)

The word "persons" as used in this chapter, sections 491 to 498, inclusive, shall be construed to import both the singular and the plural, as the case demands, and shall include municipalities, quasi-municipal corporations, corporations, companies, and associations.

33 U.S.C. 499—REGULATIONS FOR DRAWBRIDGES; PENALTIES FOR VIOLATION; ENFORCEMENT (From the River and Harbor Acts of 18 August 1894 and 13 June 1902; as amended)

It shall be the duty of all persons owning, operating, and tending the draw bridges built prior to August 18, 1894, or which may thereafter be built across the navigable rivers and other waters of the United States, to open, or cause to be opened, the draws of such bridges under such rules and regulations as in the opinion of the Secretary of the Army the public interests require to govern the opening of draw bridges for the passage of vessels and other water crafts, and such rules and regulations, when so made and published, shall have the force of law. Every such person who shall willfully fail or refuse to open, or cause to be opened, the draw of any such bridge for the passage of a boat or boats, or who shall unreasonably delay the opening of said draw after reasonable signal shall have been given, as provided in such regulations, shall be deemed guilty of a misdemeanor, and on conviction thereof shall be punished by a fine of not more than $2,000 nor less than $1,000, or by imprisonment (in the case of a natural person) for not exceeding one year, or by both such fine and imprisonment, in the discretion of the court: *Provided*, That the proper action to enforce the provisions of this section may be commenced before any commissioner, judge, or court of the United States: *Provided further*, That whenever, in the opinion of the Secretary of the Army, the public interests require it, he may make rules and regulations to govern the opening of drawbridges for the passage of vessels and other water crafts, and such rules and regulations, when so made and published, shall have the force of law, and any violation thereof shall be punished as hereinbefore provided: *Provided further*, That any regulations made in pursuance of this Section may be enforced as provided in section 413 of chapter 9 of this title, the provisions whereof are made applicable to the said regulations.

33 U.S.C. 502—CRIMINAL LIABILITY FOR FAILURE TO ALTER BRIDGE OBSTRUCTING NAVIGATION (Section 18 of the River and Harbor Act Approved 3 March 1899; as amended)

Whenever the Secretary of the Army shall have good reason to believe that any railroad or other bridge over any of the

navigable waterways of the United States is an unreasonable obstruction to the free navigation of such waters on account of insufficient height, width of span, or otherwise, or where there is difficulty in passing the draw opening or the draw span of such bridge by rafts, steamboats, or other water craft, it shall be the duty of the said Secretary, first giving the parties reasonable opportunity to be heard, to give notice to the persons or corporations owning or controlling such bridge so to alter the same as to render navigation through or under it reasonably free, easy, and unobstructed; and in giving such notice he shall specify the changes recommended by the Chief of Engineers that are required to be made, and shall prescribe in each case a reasonable time in which to make them. If at the end of such time the alteration has not been made, the Secretary of the Army shall forthwith notify the United States district attorney for the district in which such bridge is situated, to the end that the criminal proceedings hereinafter in this section mentioned may be taken. If the persons, corporation, or association owning or controlling any railroad or other bridge shall, after receiving notice to that effect, as hereinbefore required, from the Secretary of the Army, and within the time prescribed by him willfully fail or refuse to remove the same or to comply with the lawful order of the Secretary of the Army in the premises, such persons, corporation, or association shall be deemed guilty of a misdemeanor and on conviction thereof shall be punished by a fine not exceeding $5,000, and every month such persons, corporation, or association shall remain in default in respect to the removal or alteration of such bridge shall be deemed a new offense, and subject the persons, corporation, or association so offending to the penalties above prescribed.

33 U.S.C. 511†—DEFINITIONS (Section 1 of General Bridge Act Approved 21 June 1940; as amended)

Alteration of Bridges Act of 21 June 1940 as amended; popularly known as "The Truman-Hobbs Act." See Sections 511–523, inclusive, United States Code.

E. FURNISHING INFORMATION AS TO VESSELS, PASSENGERS, FREIGHT, AND TONNAGE

33 U.S.C. 554—DUTY OF SHIP OWNERS AND OFFICERS TO FURNISH INFORMATION TO PERSONS IN LOCAL CHARGE OF IMPROVEMENTS; PENALTY (From Act of 21 February 1891; as amended)

Owners, agents, masters, and clerks of vessels arriving at or departing from localities where works of river and harbor improvement are carried on shall furnish, on application of the persons in local charge of the works, a comprehensive statement of vessels, passengers, freight, and tonnage.

Every person or persons offending against the provisions of this section shall, for each and every offense, be liable to a fine of $100, or imprisonment not exceeding 2 months, to be enforced in any district court in the United States within whose territorial jurisdiction such offense may have been committed.

33 U.S.C. 555—DUTY OF SHIP OWNERS AND OFFICERS TO FURNISH INFORMATION REQUIRED BY SECRETARY OF THE ARMY (From River and Harbor Act of 22 September 1922; as amended)

Owners, agents, masters, and clerks of vessels and other craft plying upon the navigable waters of the United States, and all individuals and corporations engaged in transporting their own goods upon the navigable waters of the United States, shall furnish such statements relative to vessels, passengers, freight, and tonnage as may be required by the Secretary of the Army: *Provided,* That this provision shall not apply to those rafting logs except upon a direct request upon the owner to furnish specific information.

Every person or persons offending against the provisions of this section shall, for each and every offense, be liable to a fine of $100, or imprisonment not exceeding 2 months, to be enforced in any district court in the United States within whose territorial jurisdiction such offense may have been committed.

14 U.S.C. 86—MARKING OF OBSTRUCTIONS

The Secretary may mark for the protection of navigation any sunken vessel or other obstruction existing on any navigable waters of the United States in such manner and for so long as, in his judgment, the needs of maritime navigation require. The owner of such an obstruction shall be liable to the United States for the cost of such marking until such time as the obstruction is removed or its abandonment legally established or until such earlier time as the Secretary may determine. All moneys received by the United States from the owners of obstructions, in accordance with this section, shall be covered into the Treasury of the United States as miscellaneous receipts. This section shall not be construed so as to relieve the owner of any such obstruction from the duty and responsibility suitably to mark the same and remove it as required by law. (Public Law 89–191 approved 17 September 1965.)

F. SECTIONS OF THE FEDERAL WATER POWER ACT APPROVED 10 JUNE 1920; AS AMENDED

16 U.S.C. 804—PROJECT WORKS AFFECTING NAVIGABLE WATERS; REQUIREMENTS INSERTABLE IN LICENSE

If the dam or other project works are to be constructed across, along, or in any of the navigable waters of the United States, the commission may, insofar as it deems the same reasonably necessary to promote the present and future needs of navigation and consistent with a reasonable investment cost to the licensee, include in the license any one or more of the following provisions or requirements:

(a) That such licensee shall, to the extent necessary to preserve and improve navigation facilities, construct, in whole or in part, without expense to the United States, in connection with such dam, a lock or locks, booms, sluices, or other structures for navigation purposes, in accordance with plans and specifications approved by the Chief of Engineers and the Secretary of the Army and made part of such license.

(b) That in case such structures for navigation purposes are not made a part of the original construction at the expense of the licensee, then whenever the United States shall desire to complete such navigation facilities the licensee shall convey to the United States, free of cost, such of its land and its right of way and such right of passage through its dams or other structures, and permit such control of pools as may be required to complete such navigation facilities.

(c) That such licensee shall furnish free of cost to the United States power for the operation of such navigation facilities, whether constructed by the licensee or by the United States.

16 U.S.C. 811—OPERATIONS OF NAVIGATION FACILITIES; RULES AND REGULATIONS; PENALTIES

The Commission shall require the construction maintenance, and operation by a licensee at its own expense of such lights and signals as may be directed by the Secretary of the Army, and such fishways as may be prescribed by the Secretary of the Interior. The operation of any navigation facilities which may be constructed as a part of or in connection with any dam or diversion structure built under the provisions of this title,

†All functions, powers and duties of the Secretary of the Army and other offices and officers of the Department of the Army are transferred to the Secretary of the Department of Transportation.

whether at the expense of a licensee under this chapter or of the United States, shall at all times be controlled by such reasonable rules and regulations in the interest of navigation, including the control of the level of the pool caused by such dam, or diversion structure as may be made from time to time by the Secretary of the Army; and for willful failure to comply with any such rule or regulation such licensee shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished as provided in section 825o of this title.

16 U.S.C. 825o—PENALTIES

(a) Any person who willfully and knowingly does or causes or suffers to be done any act, matter, or thing in this chapter prohibited or declared to be unlawful, or who willfully and knowingly omits or fails to do any act, matter or thing in this chapter required to be done, or willfully and knowingly causes or suffers such omission or failure, shall, upon conviction thereof, be punished by a fine of not more than $5,000 or by imprisonment for not more than 2 years, or both.

(b) Any person who willfully and knowingly violates any rule, regulation, restriction, condition, or order made or imposed by the Commission under authority of this chapter, or any rule or regulation imposed by the Secretary of the Army under authority of subchapter I of this chapter shall, in addition to any other penalties provided by law, be punished upon conviction thereof by a fine of not exceeding $500 for each and every day during which such offense occurs.

42 U.S.C. 264—REGULATIONS TO CONTROL COMMUNICABLE DISEASES; APPREHENSION, DETENTION, AND RELEASE OF CERTAIN PERSONS FROM PARTICULAR PLACES.

(a) The Surgeon General, with the approval of the Secretary, is authorized to make and enforce such regulations as in his judgment are necessary to prevent the introduction, transmission, or spread of communicable diseases from foreign countries into the States or possessions, or from one State or possession into any other State or possession. For purposes of carrying out and enforcing such regulations, the Surgeon General may provide for such inspection, fumigation, disinfection, sanitation, pest extermination, destruction of animals or articles found to be so infected or contaminated as to be sources of dangerous infection to human beings, and other measures, as in his judgment may be necessary. § 361, 58 Stat. 703.

Note.—The following applies to a vessel that enters the St. Lawrence Seaway bound for a United States port on the Great Lakes: If the vessel would be subject to quarantine inspection upon arrival at a United States port as provided in United States Public Health Service Foreign Quarantine Regulations (Title 42 Code of Federal Regulations Part 71), quarantine inspection services are provided by United States Public Health Service quarantine officers at Montreal.

46 U.S.C. 216—DESIGNATION OF RESTRICTED WATERS UNDER THE GREAT LAKES PILOTAGE ACT OF 1960.

Pursuant to section 3(a) of the Great Lakes Pilotage Act of 1960, as amended (Public Law 86-555, 74 Stat. 259-262; 46 U.S.C. 216-216i), * * *

* * *, in the following areas registered vessels of the United States and foreign vessels shall be required to have in their service a United States registered pilot or a Canadian registered pilot for the waters concerned, * * *.

(1) *District 1.* All United States waters of the St. Lawrence River between the international boundary at St. Regis and a line at the head of the river running (at approximately 127° true) between Carruthers Point Light and South Side Light extended to the New York shore.

(2) *District 2.* All United States waters of Lake Erie westward of a line running (at approximately 026° true) from Sandusky Pierhead Light at Cedar Point to Southeast Shoal Light; all waters contained within the arc of a circle of one mile radius eastward of Sandusky Pierhead Light; the Detroit River; Lake St. Clair; the St. Clair River, and northern approaches thereto south of latitude 43°05'30" N.

(3) *District 3.* All U.S. waters of the St. Marys River, Sault Sainte Marie Locks and approaches thereto between latitude 45°59' N. at the southern approach and longitude 84°33' W. at the northern approach.

• • • • •

46 U.S.C. 725—CANADIAN VESSELS AIDING VESSELS WRECKED OR DISABLED IN UNITED STATES WATERS

Canadian vessels and wrecking appurtenance may render aid and assistance to Canadian or other vessels and property wrecked, disabled, or in distress in the waters of the United States contiguous to the Dominion of Canada.

This section shall be construed to apply to the canal and improvement of the waters between Lake Erie and Lake Huron, and to the waters of the Saint Marys River and canal: And provided further, That this section shall cease to be in force from and after the date of the proclamation of the President of the United States to the effect that said reciprocal privilege has been withdrawn, revoked, or rendered inoperative by the said Government of the Dominion of Canada.

3. RULES AND REGULATIONS

From "CODE OF FEDERAL REGULATIONS"

(C.F.R.)

Title 21—Food and Drugs (Public Health) [1]

Interstate Conveyance Sanitation Restricted Vessel Waste Discharge Areas

Restrictions regarding discharge of vessel wastes in fresh water rivers and lakes including the Great Lakes and Connecting Waters are contained in Section 1250.93, Discharge of Wastes, Interstate Conveyance Sanitation Regulations,[2] which states that "vessels operating on fresh water lakes or rivers shall not discharge sewage, or ballast or bilge water, within such areas adjacent to domestic [potable] water intakes . . ."

In the FEDERAL REGISTER of September 16, 1960 (25 F.R. 8925), restricted vessel waste discharge areas adjacent to potable (domestic) water intakes were designated. The areas were described and located by both geographical coordinates and by NOS Chart Numbers. The Potable Water Intakes are abbreviated as PWI and are shown on NOS Charts.

Except as otherwise specifically indicated, in each case the restricted area includes the water within a circle having a radius of three miles with the domestic water intake as its center, in no event, however, extending beyond the international boundary line with Canada.

This restriction applies to all vessels which are under way, moored or anchored within the restricted areas subject to the following provisions:

1. Vessels moored at docks shall not discharge sewage, ballast or bilge water overboard if dock facilities for the disposal of such waste are available.

2. Vessels required to anchor within a restricted area under an emergency condition for the safety of the vessel are exempted.

3. Vessels which provide sewage or waste treatment approved by the . . . (Commissioner of Food and Drugs), are exempted from that portion of the restriction applicable to sewage.

Penalties for violations of such regulations are authorized under Section 368(a) of the Public Health Service Act (42 U.S.C. 271).

The list of intakes and the extent of the restricted areas may be revised from time to time.

Title 33—Navigation and Navigable Waters

General Description.

The Coast Guard's organization is divided into Coast Guard Districts to assist in the performance of assigned functions and duties.

* * * * *

The Coast Guard District Commander, within the confines of his District, is responsible for the performance of assigned Coast Guard functions under the general superintendence of the Commandant.

* * * * *

A Coast Guard District consists of a defined area within the United States, its territories and possessions, as well as described portions of the high seas.

* * * * *

Within such Districts are Marine Inspection Zones and Captain of the Port Areas.

* * * * *

The Captain of the Port Area is a defined area within a Coast Guard District. Under the superintendence and direction of the Coast Guard District Commander, the Captain of the Port and his representatives are responsible for the performance of those functions of the Coast Guard concerning maritime law enforcement, saving and protecting life and property, control over anchorages and the movement of vessels within this assigned area. In certain areas a representative of the Captain of the Port may be designated for the performance of specific functions, such as the representative of the Captain of the Port at Sault Ste. Marie, Michigan, who is in charge of the St. Mary's River Patrol and controls traffic on the St. Mary's River as provided in 33 CFR Part 92. With respect to the safeguarding of vessels, harbors, ports, and waterfront facilities of the United States, the Captains of the Port where designated

[1] Recodified from Interstate Quarantine Regulations, Title 42—Public Health (42 CFR 72).

[2] Recodified from Section 72.121, Interstate Quarantine Regulations (42 CFR 72).

(otherwise the Coast Guard District Commander) perform assigned Coast Guard functions as further described in 33 CFR Part 6 (Protection and Security of Vessels, Harbors, and Waterfront Facilities), Parts 109, 110 (Anchorages), Parts 114–117 (Bridges), Parts 121, 122, 124 (Security of Vessels), 125, 126 (Security of Waterfront Facilities) and 46 CFR Parts 146 and 147 (Dangerous Cargo Regulations).

PART 3—COAST GUARD DISTRICTS, MARINE INSPECTION ZONES, AND CAPTAIN OF THE PORT AREAS

* * * * *

Subpart 3.45—Ninth Coast Guard District

§ 3.45–55 Buffalo Captain of the Port.

(a) The Buffalo Captain of the Port Office is in Buffalo, New York.

(b) The Buffalo Captain of the Port area includes all navigable waters of the United States and contiguous land areas within the following boundaries: From the international boundary in Lake Erie at longitude 81° W.; thence due south to latitude 41° N.; thence due east to longitude 78°55′ W.; thence due north to latitude 42° N.; thence due east to longitude 74°39′ W.; thence due north to the international boundary; thence southwesterly along the international boundary to the starting point.

§ 3.45–60 Chicago Captain of the Port.

(a) The Chicago Captain of the Port Office is in Chicago, Illinois.

(b) The Chicago Captain of the Port area includes all navigable waters of the United States and contiguous land areas within the following boundaries: From the Illinois, Wisconsin State line at longitude 90° W.; thence due east to longitude 87° W.; thence due south to latitude 41° N.; thence due west to longitude 90° W.; thence due north to the starting point.

§ 3.45–65 Cleveland Captain of the Port.

(a) The Cleveland Captain of the Port Office is in Cleveland, Ohio.

(b) The Cleveland Captain of the Port area includes all navigable waters of the United States and contiguous land areas within the following boundaries: From the international boundary in Lake Erie at longitude 82°25′ W.; thence due south to latitude 41° N.; thence due east to longitude 81° W.; thence due north to the international boundary; thence southwesterly along the international boundary to the starting point.

§ 3.45–70 Detroit Captain of the Port.

(a) The Detroit Captain of the Port Office is in Detroit, Michigan.

(b) The Detroit Captain of the Port area includes all navigable waters of the United States and contiguous land areas within the following boundaries: From latitude 42° N., longitude 84°30′ W.; thence due east to the international boundary; thence northerly along the international boundary to latitude 44°43′ N.; thence due west to longitude 84°30′ W.; thence due south to the starting point.

§ 3.45–75 Duluth Captain of the Port.

(a) The Duluth Captain of the Port Office is in Duluth, Minnesota.

(b) The Duluth Captain of the Port area includes all navigable waters of the United States and contiguous land areas within the following boundaries: From a point where the Minnesota-North Dakota State line meets the international boundary; thence southerly along the Minnesota-North Dakota State line to latitude 46°20′ N.; thence due east to longitude 88°30′ W.; thence northeasterly to the international boundary at latitude 86°40′ W.; thence westerly along the international boundary to the starting point.

§ 3.45–80 Muskegon Captain of the Port.

(a) The Muskegon Captain of the Port Office is in Muskegon, Michigan.

(b) The Muskegon Captain of the Port area includes all navigable waters of the United States and contiguous land areas within the following boundaries: From latitude 41° N., longitude 37° W.; thence due east to longitude 84°30′ W.; thence due north to latitude 44°43′ N.; thence due west to longitude 86°40′ W.; thence southwesterly to latitude 44°15′ N., longitude 87° W.; thence due south to the starting point.

§ 3.45–85 Milwaukee Captain of the Port.

(a) The Milwaukee Captain of the Port Office is in Milwaukee, Wisconsin.

(b) The Milwaukee Captain of the Port area includes all navigable waters of the United States and contiguous land areas within the following boundaries: From the Illinois-Wisconsin State line at longitude 90° W.; thence due east to longitude 87° W.; thence due north to latitude 44°15′ N.; thence northeasterly to latitude 44°43′ N., longitude 86°40′ W.; thence due north to latitude 45°27′ N.; thence due west to longitude 88°30′ W.; thence due north to latitude 46°20′ N.; thence due west to longitude 90° W.; thence due south to the starting point.

§ 3.45–95 Sault Ste. Marie Captain of the Port.

(a) The Sault Ste. Marie Captain of the Port Office is in Sault Ste. Marie, Michigan.

(b) The Sault Ste. Marie Captain of the Port area includes all navigable waters of the United States and contiguous land areas within the following boundaries: From the International Boundary in Lake Huron at latitude 44°43′ N.; thence northwesterly along the International Boundary to longitude 86°40′ W.; thence southwesterly to latitude 46°20′ N., longitude 88°30′ W.; thence due south to latitude 45°27′ N.; thence due east to longitude 86°40′ W.; thence due south to latitude 44°43′ N.; thence due east to the starting point.

§ 3.45–97 Toledo Captain of the Port.

(a) The Toledo Captain of the Port Office is in Toledo, Ohio.

(b) The Toledo Captain of the Port area includes all navigable waters of the United States and contiguous land areas within the following boundaries: From latitude 42°

N., longitude 84°30′ W.; thence due south to latitude 41° N.; thence due east to longitude 82°25′ W.; thence due north to the international boundary in Lake Erie; thence northwesterly along the international boundary to latitude 42° N.; thence due west to the starting point.

PART 26—VESSEL BRIDGE-TO-BRIDGE RADIOTELEPHONE REGULATIONS

Sec.
26.01 Purpose.
26.02 Definitions.
26.03 Radiotelephone required.
26.04 Use of the designated frequency.
26.05 Use of radiotelephone.
26.06 Maintenance of radiotelephone; failure of radiotelephone.
26.07 English language.
26.08 Exemption procedures.
26.09 List of exemptions. [Reserved]
26.10 Penalties.

§ 26.01 Purpose.

(a) The purpose of this part is to implement the provisions of the Vessel Bridge-to-Bridge Radiotelephone Act. This part—

(1) Requires the use of the vessel bridge-to-bridge radiotelephone;

(2) Provides the Coast Guard's interpretation of the meaning of important terms in the Act;

(3) Prescribes the procedures for applying for an exemption from the Act and the regulations issued under the Act and a listing of exemptions.

(b) Nothing in this part relieves any person from the obligation of complying with the rules of the road and the applicable pilot rules.

§ 26.02 Definitions.

For the purpose of this part and interpreting the Act—

"Secretary" means the Secretary of the Department in which the Coast Guard is operating;

"Act" means the "Vessel Bridge-to-Bridge Radiotelephone Act", 33 U.S.C.A. section 1201–1208;

"Length" is measured from end to end over the deck excluding sheer;

"Navigable waters of the United States inside the lines established pursuant to section 2 of the Act of February 19, 1895 (28 Stat. 672), as amended," means those waters governed by the Navigation Rules for Harbors, Rivers, and Inland waters (33 U.S.C. sec. 151 et seq.), the Navigation Rules for Great Lakes and their Connecting and Tributary Waters (33 U.S.C. sec. 241 et seq.), and the Navigation Rules for Red River of the North and Rivers emptying into Gulf of Mexico and Tributaries (33 U.S.C. sec. 301 et seq.);

"Power-driven vessel" means any vessel propelled by machinery; and

"Towing vessel" means any commercial vessel engaged in towing another vessel astern, alongside, or by pushing ahead.

§ 26.03 Radiotelephone required.*

(a) Unless an exemption is granted under § 26.09 and except as provided in subparagraph (4) of this paragraph, section 4 of the Act provides that—

(1) Every power-driven vessel of 300 gross tons and upward while navigating;

(2) Every vessel of 100 gross tons and upward carrying one or more passengers for hire while navigating;

(3) Every towing vessel of 26 feet or over in length while navigating; and

(4) Every dredge and floating plant engaged in or near a channel or fairway in operations likely to restrict or affect navigation of other vessels: *Provided*, That an unmanned or intermittently manned floating plant under the control of a dredge need not be required to have separate radiotelephone capability;

Shall have a radiotelephone capable of operation from its navigational bridge, or in the case of a dredge, from its main control station, and capable of transmitting and receiving on the frequency or frequencies within the 156–162 Mega-Hertz band using the classes of emissions designated by the Federal Communications Commission, after consultation with other cognizant agencies, for the exchange of navigational information.

(b) The radiotelephone required by paragraph (a) of this section shall be carried on board the described vessels, dredges, and floating plants upon the navigable waters of the United States inside the lines established pursuant to section 2 of the Act of February 19, 1895 (28 Stat. 672), as amended.

§ 26.04 Use of the designated frequency.*

(a) No person may use the frequency designated by the Federal Communications Commission under section 8 of the Act, 33 U.S.C.A. section 1207(a), to transmit any information other than information necessary for the safe navigation of vessels or necessary tests.

(b) Each person who is required to maintain a listening watch under section 5 of the Act shall, when necessary, transmit and confirm, on the designated frequency, the intentions of his vessel and any other information necessary for the safe navigation of vessels.

(c) Nothing in these regulations may be construed as prohibiting the use of the designated frequency to communicate with shore stations to obtain or furnish information necessary for the safe navigation of vessels.

NOTE: The Federal Communications Commission has designated the frequency 156.65 MHz for the use of bridge-to-bridge radiotelephone stations.

§ 26.05 Use of radiotelephone.*

Section 5 of the Act states—

(a) the radiotelephone required by this Act is for the exclusive use of the master or person in charge of the vessel, or the person designated by the master or person in charge of the vessel, or the person designated by the master or person in charge to pilot or direct the movement of the vessel, who shall maintain a listening watch on the des-

*See § 26.09(b).

ignated frequency. Nothing contained herein shall be interpreted as precluding the use of portable radiotelephone equipment to satisfy the requirements of this Act.

§ 26.06 Maintenance of radiotelephone; failure of radiotelephone.*

Section 6 of the Act states—

(a) Whenever radiotelephone capability is required by this Act, a vessel's radiotelephone equipment shall be maintained in effective operating condition. If the radiotelephone equipment carried aboard a vessel ceases to operate, the master shall exercise due diligence to restore it or cause it to be restored to effective operating condition at the earliest practicable time. The failure of a vessel's radiotelephone equipment shall not, in itself, constitute a violation of this Act, nor shall it obligate the master of any vessel to moor or anchor his vessel; however, the loss of radiotelephone capability shall be given consideration in the navigation of the vessel.

§ 26.07 English language.*

No person may use the services of, and no person may serve as a person required to maintain a listening watch under section 5 of the Act. 33 U.S.C.A. section 1204 unless he can speak the English language.

§ 26.08 Exemption procedures.

(a) Any person may petition for an exemption from any provision of the Act or this part;

(b) Each petition must be submitted in writing to U.S. Coast Guard (G–W), 400 Seventh Street SW., Washington, DC 20590, and must state—

(1) The provisions of the Act or this part from which an exemption is requested; and

(2) The reasons why marine navigation will not be adversely affected if the exemption is granted and if the exemption relates to a local communication system how that system would fully comply with the intent of the concept of the Act but would not conform in detail if the exemption is granted.

§ 26.09 List of exemptions.

(a) All vessels navigating on those waters governed by the navigation rules for Great Lakes and their connecting and tributary waters (33 U.S.C. 241 et seq.) are exempt from the requirements of the Vessel Bridge-to-Bridge Radiotelephone Act and this part until May 6, 1975.

(b) Each vessel navigating on the waters under the navigation rules for the Great Lakes and their connecting and tributary waters (33 U.S.C. 241 et seq.) and to which the Vessel Bridge-to-Bridge Radiotelephone Act (33 U.S.C. 1201–1208) applies is exempt from the requirements in 33 U.S.C. 1203, 1204, and 1205 and the regulations under §§ 26.03, 26.04, 26.05, 26.06, and 26.07 of this Part. Each of these vessels and each person to whom 33 U.S.C. 1208(a) applies must comply with Articles VII, X, XI, XII, XIII, XV, and XVI and Technical Regulations 1–7 of "The Agreement Between the United States of America and Canada for Promotion of Safety on the Great Lakes by Means of Radio, 1973.

§ 26.10 Penalties.

Section 9 of the Act states—

(a) Whoever, being the master or person in charge of a vessel subject to the Act, fails to enforce or comply with the Act or the regulations hereunder; or whoever, being designated by the master or person in charge of a vessel subject to the Act to pilot or direct the movement of a vessel fails to enforce or comply with the Act or the regulations hereunder—is liable to a civil penalty of not more than $500 to be assessed by the Secretary.

(b) Every vessel navigated in violation of the Act or the regulations hereunder is liable to a civil penalty of not more than $500 to be assessed by the Secretary, for which the vessel may be proceeded against in any District Court of the United States having jurisdiction.

(c) Any penalty assessed under this section may be remitted or mitigated by the Secretary, upon such terms as he may deem proper.

NOTE.—See also U.S.-Canada Agreement for the Promotion of Safety on the Great Lakes by Means of Radio in Chapter 1.

PART 64—MARKING OF SUNKEN OBSTRUCTIONS

Subpart 64.01—Marking of Sunken Vessels or Other Obstructions

Sec.
64.01–1 General.
64.01–5 Marking by owners.
64.01–10 Marking by the U.S. Coast Guard.

Subpart 64.05—Charges for Marking

64.05–1 Liability of owner for cost of marking.

Subpart 64.10—Reports

64.10–1 Reports of sunken obstructions.

Subpart 64.15—Notices of Abandonment

64.15–1 Notices of tenders of abandonment.

Subpart 64.01—Marking of Sunken Vessels or Other Obstructions

§ 64.01–1 General.

(a) The owner of a vessel sunk in the navigable waters of the United States who fails to mark the wreck immediately for the protection of navigation with a buoy or daymark during the day and a light at night may, in addition to being in violation of 33 U.S.C. 409, be liable for resulting damage to the public. The owner of a sunken obstruction other than a vessel which creates an obstruction to the navigable capacity of any of the waters of the United States may, in addition to being in violation of 33 U.S.C. 403, be liable for resulting damage to the public.

(b) The Coast Guard is authorized to mark for the protection of navigation any sunken vessel or other obstruction that is not suitably marked. Marking by the

*See § 26.09(b).

Coast Guard does not relieve the owner of any such obstruction from the duty and responsibility suitably to mark the obstruction and remove it as required by law.

§ 64.01-5 Marking by owners.

Buoys, daymarks, and lights established by owners of sunken vessels or other obstructions to mark such obstructions for the protection of navigation shall conform to the lateral system of buoyage prescribed by Subpart 62.25 of this chapter. Such markings shall be maintained until the obstruction is removed or the right of the owner to abandon is legally established and has been exercised.

§ 64.01-10 Marking by the U.S. Coast Guard.

(a) When the District Commander within whose jurisdiction a sunken vessel is located determines that the wreck is not suitably marked by the owner for the protection of navigation, he may mark the wreck in such manner and for so long as in his judgment the needs of maritime navigation require. The costs of such marking by the Coast Guard will be charged to the owner of the wreck.

(b) When the District Commander within whose jurisdiction a sunken obstruction other than a vessel is located determines that the obstruction is not suitably marked for the protection of navigation, he may mark the obstruction in such manner and for so long as, in his judgment, the needs of maritime navigation require. The costs of such marking will be charged to the owner of the obstruction. When the needs of navigation permit, the owner will be informed that the obstruction should be marked and will be afforded reasonable opportunity to mark the obstruction.

Subpart 64.05—Charges for Marking

§ 64.05-1 Liability of owner for cost of marking.

(a) Pursuant to the provisions of 14 U.S.C. 86 the owner of a sunken vessel or other obstruction marked by the Coast Guard shall be liable for the cost of such marking until such time as the obstruction is removed or the right of the owner to abandon is legally established and has been exercised or until such earlier time as the District Commander in whose jurisdiction the obstruction is located may determine.

(b) Charges for the costs of marking by the Coast Guard shall be determined in accordance with Part 74 of this chapter.

Subpart 64.10—Reports

§ 64.10-1 Reports of sunken obstructions.

(a) Owners of vessels sunk in the navigable waters of the United States shall promptly report to the nearest U.S. Coast Guard Marine Inspection Office the action he is taking to mark the wreck giving, in addition to the report required by 46 CFR 136.05, the following information:

(1) Name and description of the sunken vessel.

(2) Accurate location of the vessel.

(3) Depth of water over the vessel.

(4) Location and type of marking established, including color and shape of buoy or daymark and characteristic of the light.

(b) Owners of sunken obstructions other than vessels are encouraged to report the existence of such obstructions in the same manner as prescribed for sunken vessels and shall report promptly the location and type of any markings established, giving a complete description of the color and shape of any buoy or daymark and the characteristic of any lights established to mark the obstruction.

Subpart 64.15—Notices of Abandonment

§ 64.15-1 Notices of tenders of abandonment.

Notices of abandonment of sunken vessels or other obstructions will not be accepted by the Coast Guard. Any notice of intention to abandon should be addressed to the District Engineer, Corps of Engineers, U.S. Army, within whose district the sunken vessel or other obstruction is located.

PART 68 [Reserved]

PART 90—PILOT RULES FOR THE GREAT LAKES

LIGHTS AND DAY SIGNALS FOR VESSELS, DREDGES, AND VESSELS WORKING ON WRECKS AND OBSTRUCTIONS, ETC.

Sec.
90.22 Signals to be displayed by a towing vessel when towing a submerged or partly submerged object upon a hawser when no signals can be displayed upon the object which is towed.
90.23 Steam vessels, derrick boats, lighters, or other types of vessels made fast alongside a wreck, or moored over a wreck which is on the bottom or partly submerged, or which may be drifting.
90.24 Dredges held in stationary position by moorings or spuds.
90.25 Self-propelling suction dredges under way and engaged in dredging operations.
90.26 Vessels moored or anchored and engaged in laying cables or pipe, submarine construction, excavation, mat sinking, bank grading, dike construction, revetment, or other bank protection operations.
90.27 Lights to be displayed on pipe lines.
90.28 Lights generally.
90.29 Vessels moored or at anchor.

PASSING FLOATING PLANT WORKING IN NAVIGABLE CHANNELS

90.30 Passing signals.
90.31 Speed of vessels passing floating plant working in channels.
90.32 Light-draft vessels passing floating plant.
90.33 Aids to navigation marking floating-plant moorings.
90.34 Obstruction of channel by floating plant.
90.35 Clearing of channels.
90.36 Protection of marks placed for the guidance of floating plant.
90.37 Lights for Great Lakes Pilot Vessels.

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LIGHTS AND DAY SIGNALS FOR VESSELS, DREDGES, AND VESSELS WORKING ON WRECKS AND OBSTRUCTIONS, ETC.

§ 90.22 Signals to be displayed by a towing vessel when towing a submerged or partly submerged object upon a hawser when no signals can be displayed upon the object which is towed.

(a) The vessel having the submerged object in tow shall display by day, where they can best be seen, two shapes, one above the other, not less than six feet apart, the lower shape to be carried not less than 10 feet above the deck house. The shapes shall be in the form of a double frustum of a cone, base to base, not less than two feet in diameter at the center nor less than eight inches at the ends of the cones, and to be not less than four feet lengthwise from end to end, the upper shape to be painted in alternate horizontal stripes of black and white, eight inches in width, and the lower shape to be painted a solid bright red.

(b) By night the towing vessel shall display the regular side lights, but in lieu of the regular white towing lights shall display four lights in a vertical position not less than three feet nor more than six feet apart, the upper and lower of such lights to be white, and the two middle lights to be red, all of such lights to be of the same character as the regular towing lights.

§ 90.23 Steam vessels, derrick boats, lighters, or other types of vessels made fast alongside a wreck, or moored over a wreck which is on the bottom or partly submerged, or which may be drifting.

(a) Steam vessels, derrick boats, lighters, or other types of vessels made fast alongside a wreck, or moored over a wreck which is on the bottom or partly submerged, or which may be drifting, shall display by day two shapes of the same character and dimensions and displayed in the same manner as required by § 201.2(a), except that both shapes shall be painted a solid bright red, but where more than one vessel is working under the above conditions, the shapes need be displayed only from one vessel on each side of the wreck from which they can best be seen from all directions.

(b) By night this situation shall be indicated by the display of a white light from the bow and stern of each outside vessel or lighter not less than six feet above the deck, and in addition thereto there shall be displayed in a position where they can best be seen from all directions two red lights carried in a vertical line not less than three feet nor more than six feet apart, and not less than 15 feet above the deck.

§ 90.24 Dredges held in stationary position by moorings or spuds.

(a) Dredges which are held in stationary position by moorings or spuds shall display by day two red balls not less than two feet in diameter and carried in a vertical line not less than three feet nor more than six feet apart, and at least 15 feet above the deck house and in a position where they can best be seen from all directions.

(b) By night they shall display a white light at each corner, not less than six feet above the deck, and in addition thereto there shall be displayed in a position where they can best be seen from all directions two red lights carried in a vertical line not less than three feet nor more than six feet apart, and not less than 15 feet above the deck. When scows are moored alongside a dredge in the foregoing situation they shall display a white light on each outboard corner, not less than six feet above the deck.

§ 90.25 Self-propelling suction dredges under way and engaged in dredging operations.

(a) Self-propelling suction dredges under way and engaged in dredging operations shall display by day two black balls not less than two feet in diameter and carried in a vertical line not less than 15 feet above the deck house, and where they can best be seen from all directions. The term "dredging operations" shall include maneuvering into or out of position at the dredging site, but shall not include proceeding to and from the site.

(b) By night they shall carry, in addition to the regular running lights, two red lights of the same character as the white masthead light and in a vertical line beneath that light, the red lights to be not less than three feet nor more than six feet apart and the upper red light to be not less than four feet nor more than six feet below the masthead light, and on or near the stern two red lights in a vertical line not less than four feet nor more than six feet apart, to show through four points of the compass; that is, from right astern to two points on each quarter.

§ 90.26 Vessels moored or anchored and engaged in laying cables or pipe, submarine construction, excavation, mat sinking, bank grading, dike construction, revetment, or other bank protection operations.

(a) Vessels which are moored or anchored and engaged in laying cables or pipe, submarine construction, excavation, mat sinking, bank grading, dike construction, revetment, or other bank protection operations, shall display by day, not less than 15 feet above the deck, where they can best be seen from all directions, two balls not less than two feet in diameter, in a vertical line not less than three feet nor more than six feet apart, the upper ball to be painted in alternate black and white vertical stripes six inches wide, and the lower ball to be painted a solid bright red.

(b) By night they shall display three red lights, carried in a vertical line not less than three feet nor more than six feet apart, in a position where they can best be seen from all directions, with the lowermost light not less than 15 feet above the deck.

(c) Where a stringout of moored vessels or barges is engaged in the operations, three red lights carried as prescribed in paragraph (b) of this section shall be displayed at the channelward end of the stringout. Where the stringout crosses the navigable channel and is to be opened for the passage of vessels, the three red lights shall be displayed at each side of the opening instead of at the outer end of the stringout. There shall also be displayed upon such stringout one horizontal row of amber lights not less than six feet above the deck, or above the deck house where the craft carries a deck house, in

a position where they can best be seen from all directions. spaced not more than 50 feet apart so as to mark distinctly the entire length and course of the stringout.

§ 90.27 Lights to be displayed on pipe lines.

Pipe lines attached to dredges, and either floating or supported on trestles, shall display by night one row of amber lights not less than eight feet nor more than 12 feet above the water, about equally spaced and in such number as to mark distinctly the entire length and course of the line, the intervals between lights where the line crosses navigable channels to be not more than 30 feet. There shall also be displayed on the shore or discharge end of the line two red lights, three feet apart, in a vertical line with the lower light at least eight feet above the water, and if the line is to be opened at night for the passage of vessels, a similar arrangement of lights shall be displayed on each side of the opening.

§ 90.28 Lights generally.

(a) All the lights required by §§ 90.22 to 90.27, except as provided in §§ 90.22(b) and 90.25(b), shall be of such character as to be visible on a dark night with a clear atmosphere for a distance of at least two miles.

(b) The lights required by § 90.22(b) to be of the same character as the regular towing lights, and the lights required by § 90.25(b) to be of the same character as the masthead light, shall be of such character as to be visible on a dark night with a clear atmosphere for a distance of at least five miles.

(c) All floodlights or headlights which may interfere with the proper navigation of an approaching vessel shall be so shielded that the lights will not blind the pilot of such vessel.

§ 90.29 Vessels moored or at anchor.

Vessels of more than 65 feet in length when moored or anchored in a fairway or channel shall display between sunrise and sunset on the forward part of the vessel where it can best be seen from other vessels one black ball not less than two feet in diameter.

PASSING FLOATING PLANT WORKING IN NAVIGABLE CHANNELS

§ 90.30 Passing signals.

(a) Vessels intending to pass dredges or other types of floating plant working in navigable channels, when within a reasonable distance therefrom and not in any case over a mile, shall indicate such intention by one long blast of the whistle, and shall be directed to the proper side for passage by the sounding, by the dredge or other floating plant, of the signal prescribed in the local pilot rules for vessels under way and approaching each other from opposite directions, which shall be answered in the usual manner by the approaching vessel. If the channel is not clear, the floating plant shall sound the alarm or danger signal and the approaching vessel shall slow down or stop and await further signal from the plant.

(b) When the pipe line from a dredge crosses the channel in such a way that an approaching vessel cannot pass safely around the pipe line or dredge, there shall be sounded immediately from the dredge the alarm or danger signal and the approaching vessel shall slow down or stop and await further signal from the dredge. The pipe line shall then be opened and the channel cleared as soon as practicable; when the channel is clear for passage the dredge shall so indicate by sounding the usual passing signal as prescribed in paragraph (a) of this section. The approaching vessel shall answer with a corresponding signal and pass promptly.

(c) When any pipe line or swinging dredge shall have given an approaching vessel or tow the signal that the channel is clear, the dredge shall straighten out within the cut for the passage of the vessel or tow.

NOTE: The term "floating plant" as used in §§ 90.30 to 90.36, includes dredges, derrick boats, snag boats, drill boats, pile drivers, maneuver boats, hydraulic graders, survey boats, working barges, and mat sinking plant.

§ 90.31 Speed of vessels passing floating plant working in channels.

Vessels, with or without tows, passing floating plant working in channels, shall reduce their speed sufficiently to insure the safety of both the plant and themselves, and when passing within 200 feet of the plant their speed shall not exceed five miles per hour. While passing over lines of the plant, propelling machinery shall be stopped.

§ 90.32 Light-draft vessels passing floating plant.

Vessels whose draft permits shall keep outside the buoys marking the ends of mooring lines of floating plant working in channels.

§ 90.33 Aids to navigation marking floating-plant moorings.

Breast, stern, and bow anchors of floating plant working in navigable channels shall be marked by barrel or other suitable buoys. By night approaching vessels shall be shown the location of adjacent buoys by throwing a suitable beam of light from the plant on the buoys until the approaching vessel has passed, or the buoys may be lighted by red lights, visible in all directions, of the same character as specified in § 90.28(a).

§ 90.34 Obstruction of channel by floating plant.

Channels shall not be obstructed unnecessarily by any dredging or other floating plant. While vessels are passing such plant all lines running therefrom across the channel on the passing side which may interfere with or obstruct navigation shall be slacked to the bottom of the channel.

§ 90.35 Clearing of channels.

When special or temporary regulations have not been prescribed and action under the regulations contained in §§ 90.30 to 90.34 will not afford clear passage, floating plant in narrow channels shall, upon notice, move out of the way of vessels a sufficient distance to allow them a clear passage. Vessels desiring passage shall, however,

give the master of the floating plant ample notice in advance of the time they expect to pass.

NOTE: If it is necessary to prohibit or limit the anchorage or movement of vessels within certain areas in order to facilitate the work of improvement, application should be made through official channels for establishment by the Secretary of the Army of special or temporary regulations for this purpose.

§ 90.36 Protection of marks placed for the guidance of floating plant.

Vessels shall not run over anchor buoys, or buoys, stakes, or other marks placed for the guidance of floating plant working in channels; and shall not anchor on the ranges of buoys, stakes, or other marks placed for the guidance of such plant.

§ 90.37 Lights for Great Lakes pilot vessels.

(a) A power driven pilot vessel when engaged on pilotage duty and under way:

(1) Shall carry a white light at the masthead at a height of not less than 20 feet above the hull, visible all round the horizon at a distance of at least 3 miles and at a distance of 8 feet below it a red light similar in construction and character. If such a vessel is of less than 65 feet in length the vessel may carry the white light at a height of not less than 9 feet above the gunwale and the red light at a distance of 4 feet below the white light.

(2) Shall carry the sidelights prescribed by Great Lakes Rule 3 (33 U.S.C. 252) or by the Act of April 25, 1940 (46 U.S.C. 526b), as appropriate, and a white light at the stern showing an unbroken light over an arc of the horizon of 135°, so fixed as to show the light 67½° from right aft on each side of the vessel, and of such a character as to be visible at a distance of at least 2 miles.

(3) Shall show one or more flareup lights at intervals not exceeding 10 minutes. An intermittent white light visible all round the horizon may be used in lieu of flareup lights.

(b) A sailing pilot vessel when engaged on pilotage duty and under way:

(1) Shall carry a white light at the masthead visible all round the horizon at a distance of at least 3 miles.

(2) Shall be provided with the sidelights prescribed in paragraph (a)(2) of this section or the portable lanterns prescribed by Great Lakes Rule 8 (33 U.S.C. 257), as appropriate, and shall, on the near approach of or to other vessels, have such lights ready for use, and shall show them at short intervals to indicate the direction in which the pilot vessel is heading, but the green light shall not be shown on the port side nor the red light on the starboard side. The vessel shall also carry the stern light prescribed in paragraph (a)(2) of this section.

(3) Shall show one or more flareup lights at intervals not exceeding 10 minutes.

(c) A pilot vessel when engaged on pilotage duty and not under way shall carry the lights and show the flares prescribed in paragraphs (a) (1) and (3) or (b) (1) and (3) of this section, as appropriate, and if at anchor shall also carry the anchor lights prescribed in Great Lakes Rule 9 (33 U.S.C. 253).

(d) A pilot vessel when not engaged on pilotage duty shall show the lights or shapes for a similar vessel of the same length.

PART 92—ANCHORAGE AND NAVIGATION REGULATIONS; ST. MARYS RIVER, MICHIGAN

§ 92.01 General instructions.

The regulations in this part control vessel traffic in the United States waters of the St. Marys River between Point Iroquois and Point Detour*, except the waters of the St. Marys Falls Canal. The regulations in this part shall not be considered to cover all of the obligations imposed by the law upon vessels and their operators, and shall not be construed as relieving the owners or persons operating vessels from any penalties which might be incurred in the violation of any of the general laws relating to shipping on the Great Lakes and tributary waters, or a violation of regulations issued pursuant to such laws.

§ 92.03 Captain of the Port.

The Coast Guard officer to whom is assigned the duty of enforcing the rules and regulations in this part is designated "Captain of the Port." His office is at Sault Ste. Marie, Mich.

§ 92.05 St. Marys River patrol.

The St. Marys River patrol comprises all of the personnel and equipment of the Coast Guard employed by the captain of the port in the enforcement of the rules and regulations in this part.

§ 92.07 District engineer.

The officer of the United States Army Engineers in charge of the district is authorized to declare any channel closed when by reason of low water, obstruction, or obscurity in the channel or other cause, he deems such action necessary for the safety of shipping; and under contrary circumstances, or for the expediting of vessel passage, to declare any channel open. He or his local representative decides the proper disposition of dredging and wrecking outfits legally engaged in improving or clearing a channel, and the allowable maximum speed and draft of vessels in channels which are impaired temporarily. His decisions with respect to the foregoing are duly communicated to the captain of the port. The movements of vessels in the St. Marys Falls Canal are under the direction of the district engineer or his local representative.

§ 92.09 [Revoked]

§ 92.13 Routing of traffic in channels.

The routing of traffic through the several dredged channels is contingent upon the physical conditions in them: and the vessel masters should be prepared upon notice from the patrol, or through published notification, to follow such alternate route as may be prescribed, or to proceed with caution. Under normal conditions traffic passes up the Middle Neebish Channel, and down the West

*Corrected to De Tour.

Neebish Channel; but it may be necessary in emergency to pass two-way traffic in either of those channels. It may also become necessary to close either or both channels for a short time owing to obscurity of navigation marks, in which case vessels should be prepared to anchor and wait a clearing away of obscurity.

§ 92.15 [Revoked]

§ 92.17 [Revoked]

§ 92.19 Temporary closure of West Neebish Channel.

(a) In the event the West Neebish Channel is temporarily closed to navigation (due to dredging, grounding of vessels, or other reasons), the resulting two-way navigation will pass through the Middle Neebish, Munuscong, and Sailors Encampment Channels.

(b) In these channels between Lake Munuscong and Lake Nicolet, the westerly 300-foot portion of these channels provides a 27-foot depth and the easterly 200-foot portion provides a 21-foot depth. When vessel drafts permit, upbound vessels shall use the easterly (21-foot depth) portion of these channels. All downbound vessels shall use the westerly (27-foot depth) portion of these channels.

(c) [Reserved]

(d) A downbound vessel when abeam of Nine Mile Point may make a "Securité Call" to inform all traffic that she is now entering the two-way traffic channels.

§ 92.21 Sound signals used by patrol.

(a) Two short blasts and one long blast of whistle or horn indicate that the signalling unit desires to speak a passing vessel, and the signaled vessel will check speed and await orders. Vessels should use this signal to speak a lookout station or passing patrol boat.

(b) Three long blasts of whistle or horn indicate that the vessel signaled is moving at too high a rate of speed. This signal may be used by dredging and wrecking plants working in channels.

§ 92.23 Definitions.

(a) The word "vessel," as used in this part, shall be held to include all types of floating craft and equipment. Where special provisions apply only to rafts, dredges, etc., the type will be specified by its class designation.

(b) Speed limits established in this part are expressed in terms of statute miles per hour over the ground.

§ 92.25 Obedience to instructions.

All persons in charge of or operating vessels in the St. Marys River are required to yield prompt and implicit obedience to the directions of the captain of the port and the officers and men of the St. Marys River patrol, acting under his instructions, in connection with the enforcement of the rules and regulations in this part.

§ 92.26 Reporting procedures for vessels transiting the St. Mary's River.

(a) Every upbound vessel, when abeam of Detour* Reef Light shall notify the Coast Guard Control Office, St. Mary's River Patrol (Radiotelephone call: "Soo Control"), of her time of passage at Detour* Reef Light and her draft.

(b) Similarly, every downbound vessel, when abeam of Parisienne Island (Ile Parisienne), shall notify the Coast Guard Control Office, St. Mary's River Patrol (Radiotelephone call: "Soo Control"), of her time of passage at Parisienne Island and her draft. Such vessel when making the turn from the Birch Point Range on to the Brush Point Range shall make a second call to "Soo Control" reporting her position. Such vessel when turning on to the Point Aux Pins Channel Range at Brush Point (old Coast Guard Lookout Station No. 6) shall make a third call to "Soo Control" reporting her position.

§ 92.27 Anchorage grounds.

The authorized anchorage grounds are those areas outside of the dredged channels, and clear of the steering courses in other portions of the St. Mary's River, between Point Iroquois and Point Detour*. Vessels shall be anchored so as not to swing into channel limits or across steering courses.

§ 92.29 Emergency anchoring.

A vessel may be permitted in an emergency, due to breakdown of machinery or other accident or obscurity of navigation marks, to anchor in a dredged channel; but the vessel shall be anchored as near the edge of the channel as possible, and shall get under way and proceed as soon as the emergency ceases, unless otherwise directed.

§ 92.31 Forbidden anchorage.

It is forbidden to anchor a vessel at any time in the area to the southward of the Point Aux Pins Range, lying between Brush Point and the waterworks intake crib off Big Point; also within a quarter mile of the said intake crib in any direction.

§ 92.33 Dredging and wrecking plants in channels.

Duly authorized dredging and wrecking plants, when engaged in improving or clearing a channel, will be permitted to anchor or moor in the channel under such conditions as may be prescribed by the district engineer or his local representative.

§ 92.35 Shifting anchorage when directed.

The captain of the port, or the St. Marys River patrol acting under his instructions, is empowered to cause any anchored vessel to shift anchorage when and as directed, whenever in the judgment of the enforcing officer such action is deemed necessary for the safety of vessels, the safe or expeditious passage of shipping, or the preservation or effective operation of Government installations. In enforcing this section the officer will have due regard for the hazards of navigation and vessel handling which may exist at the time, and under such circumstances will permit a reasonable delay in compliance by the vessel directed to move.

§ 92.37 Order of departure from anchorage.

(a) Whenever vessels collect in any part of the river or on anchorage grounds, by reason of temporary closure of channel or impediment to navigation, the order of getting under way and proceeding by the vessels so col-

*Corrected to De Tour.

lected shall be the order in which they arrived at the place of assembly unless otherwise directed by a unit of the patrol. The patrol is authorized to advance any vessel in the order of procedure to expedite the movement of mails, passengers, or cargo of a perishable nature, or to facilitate passage of vessels through any channel when partially obstructed by ice or by other causes, or to facilitate passage through the locks as indicated to the patrol by the officer in charge of the St. Marys River Canal.

(b) When by reason of ice or other special conditions, it is obvious that low power vessels, vessels of particular construction, tows or rafts, cannot maintain their order of proceeding and constitute a hazard to other vessels capable of proceeding, the Captain of the Port may declare emergency conditions existing and temporarily refuse such vessel permission to enter or proceed in the river.

§ 92.39 Visual signals for dredges and wrecking plants.

Dredges and wrecking plants while engaged in working on the St. Marys River shall display the visual signals prescribed for them by the Department of the Army.

§ 92.41 Visual signals on vessel aground in channel.

A vessel aground in a dredged channel shall carry from sunset to sunrise in addition to the white light or lights prescribed for a vessel at anchor, two red lights hoisted vertically not less than 3 feet apart, in such position and height as to be readily visible to vessels bound up and down the channel.

§ 92.43 Sound signal for vessel aground in the channel.

A vessel aground in a channel shall sound several short and rapid blasts of her whistle, not less than five, upon the approach of another vessel bound up or down the channel. If the approaching vessel cannot pass with safety, she shall stop and make proper dispositions to avoid fouling the grounded vessel, and shall upon the approach of another vessel coming up astern sound the same signal. Should additional vessels approach from that same direction, it shall be the duty of the last vessel in line to sound this signal. In times of low visibility, the signal described herein shall be in addition to the prescribed fog signal.

§ 92.45 Special sound signal for Middle Neebish Channel.

When two-way traffic is prescribed for Middle Neebish Channel, a downbound vessel when abreast of Coyle Point shall sound a blast of her whistle of at least 8 seconds' duration, and an upbound vessel when abreast of Everens Point shall sound the same signal.

§ 92.47 Temporary closure of channel.

When any channel is closed or under limited traffic conditions, no vessel shall proceed except in accordance with the provisions of § 92.37, without specific orders from the patrol.

§ 92.49 Speed limits for vessels of 50 gross tons or over.

(a) The speed limits in paragraphs (b), (c), (d), and (e) of this section are in statute miles per hour over the ground. The speed limits may not be exceeded by any upbound or downbound vessel of 50 gross tons or over.

(b) Detour* Reef Light to Point Aux Frenes Passing Range South Front Light: The speed limit between—

(1) Detour* Reef Light and Sweets Point Light is 17 miles per hour; and

(2) Round Island Light and Point Aux Frenes Passing Range South Front Light is 14 miles per hour.

(c) Munuscong Channel Lighted Buoy 8 to Lake Nicolet Light 80: The speed limit between—

(1) Munuscong Channel Buoy 8 and Munuscong Channel Buoy 14 is 12 miles per hour;

(2) Munuscong Channel Buoy 14 and Sailors Encampment Channel Buoy 26 is 9 miles per hour;

(3) Sailors Encampment Channel Buoy 26 and Lake Nicolet Lighted Buoy 62 is 10 miles per hour; and

(4) Lake Nicolet Lighted Buoy 62 and Lake Nicolet Light 80 is 12 miles per hour.

(d) Lake Nicolet Light 80 and West Neebish Channel Light 10: The speed limit between Lake Nicolet Light 80 and West Neebish Channel Light 10 is 10 miles per hour;

(e) Lake Nicolet Light 80 to Point Aux Pins Main Light: The speed limit between—

(1) Lake Nicolet Light 80 and Six-Mile Point Range Rear Light is 10 miles per hour;

(2) Six-Mile Point Range Rear Light and the lower limit of the St. Marys Falls Canal is 8 miles per hour for upbound vessels and 10 miles per hour for downbound vessels; and

(3) The upper limit of the St. Marys Falls Canal and Point Aux Pins Main Light is 12 miles per hour.

(f) The Commander, Ninth Coast Guard District may establish, raise, lower, or otherwise amend speed limit regulations on the St. Marys River. In exercising this authority, the District Commander considers all interests affected by the speed of vessels in the river, including the protection of the property of riparian owners. The regulations issued by the Commander, Ninth Coast Guard District are published in the Federal Register and in the Notice to Mariners.

§ 92.55 Speed limit approaching St. Marys Falls Canal.

Vessels approaching the St. Marys Falls Canal shall at all times reduce speed to the extent of being under full control with ability to maneuver in accordance with the instructions of the officers in charge of the St. Marys Falls Canal before entering the canal.

§ 92.57 Pipe Island passages.

Vessels of 500 gross tons or over shall leave Pipe Island Shoal and Pipe Island on the port hand in passing them, except that an upbound vessel which will stop at one of the Detour* Coal Wharves above Watson Reefs may pass to the westward of the shoal and island.

§ 92.59 Directional Neebish Channels.

When both the Middle Neebish Channel and the West Neebish Channel are available to traffic, vessels of 100 gross tons or over shall pass upbound through Middle Neebish Channel and downbound through West Neebish

*Corrected to De Tour.

Channel. Vessels over the prescribed tonnage making regular local stops in either of those channels may run counter to the general traffic direction only on written permit issued by the captain of the port, for such term and under such conditions of renewal or revocation as he may prescribe. A vessel thus running counter to the general traffic shall keep off the channel range when an approaching vessel is on or entering that range.

§ 92.61 Passing and approach in channels.

(a) In a channel where the speed is restricted to 12 miles an hour or less, no vessel of 500 gross tons or over shall approach nearer than one-quarter of a mile to a vessel bound in the same direction, nor pass such a vessel except between Little Rapids Cut Lighted Buoy No. 105 and the St. Marys Falls Canal, and for upbound vessels, only between Vidal Shoal and Big Point or except as provided in paragraph (b) of this section and § 92.63.

(b) In order to facilitate passing in Lake Nicolet, upbound vessels may, after passing Lake Nicolet Lighted Buoy No. 68 off Shingle Bay, approach not nearer than 500 feet to a vessel bound in the same direction.

§ 92.63 Vessel passing towing tug going in same direction.

A vessel at normal speed coming up on a tug towing a dredge or scow bound in the same direction as the overtaking vessel in a restricted channel may pass such tow, after the prescribed exchange of signals. Under such circumstances the tug shall not increase speed during the passing, and shall haul with its tow to the proper side of the channel to allow passing room.

§ 92.65 Vessels going in the same direction; when passing prohibited.

No vessel shall pass or attempt to pass another vessel bound in the same direction, when such passing would bring more than two vessels abreast in any of the passages between Lake Munuscong Junction Lighted Bell Buoy in Upper Lake Munuscong and Big Point in the upper St. Marys River, except that such passing is permitted between Little Rapids Cut Lighted Buoy No. 105 and the St. Marys Falls Canal.

§ 92.67 Towing vessels; hauling clear of ranges; tow lines.

(a) Towing vessels engaged in shortening or lengthening tows or dropping or making up tows, mooring or unmooring or anchoring or hoisting anchor, loading or discharging stores or cargo from boats alongside, or awaiting supply boats, shall haul clear of the ranges and permit unobstructed passage to other vessels.

(b) On the connecting waters of the Great Lakes between Point Iroquois, upper St. Marys River and Frying Pan Island, lower St. Marys River, the length of tow lines shall not exceed by more than 50 feet, the length of the scow, barge, vessel, or other craft being towed: *Provided*, That no scow, barge, vessel, or other craft shall be required to have a tow line less than 250 feet. The length of the tow line shall be measured from the stern of one vessel to the bow of the following vessel.

§ 92.69 Dropping of towed vessels.

Towed vessels shall not be dropped in any of the usual steering courses, but shall be hauled clear of the course before being left by the towing vessel.

§ 92.71 Speed through dredged channels.

The minimum speed at which any vessel or tow will be permitted to make regular passage through any dredged channel shall be 5 miles an hour over the ground; and any craft which cannot make this speed shall not enter any of the channels until the patrol has been communicated with, and directions received as to further procedure.

§ 92.73 Navigation of dredged channels by sail.

Vessels of 10 gross tons or over shall not navigate any dredged channel under sail power; and such vessel capable of propulsion by both machinery and sail shall not carry sail in any of the dredged channels.

§ 92.75 Obstruction of traffic; retarding other vessels.

No vessel shall maneuver so as to affect adversely the relative position of another vessel when entering any of the cuts, nor attempt to obstruct traffic, nor unnecessarily retard a following vessel, nor increase speed after having signalled permission to an overtaking vessel to pass.

§ 92.77 Rafts in channels.

No raft shall enter any of the dredged channels between Everens Point and the improved channel above Round Island without first having communicated with the patrol and obtained permission and directions as to route and procedure. So long as rafts are in any portion of the passages between the points named they shall be under the control of the patrol, and shall obey all instructions as to time and manner of movement or stoppage. They shall use the Lake George Channel when it will serve their passage toward destination.

§ 92.79 Reporting obstruction of channels.

Any person having knowledge of an obstruction in the channel, or the loss of an anchor, or the grounding of a vessel in or out of the channel, or the striking of any obstruction, or any other hazard or danger to navigation, at any point in the St. Marys River between Point Detour* and Point Iroquois, shall report the same without delay to the Captain of the Port and also the Corps of Engineers' Control Tower, St. Marys Falls Canal.

§ 92.81 Government vessels.

Vessels when signalled to do so shall give way to boats of the St. Marys River patrol, and to United States vessels on duty in connection with the maintenance of channels, and accord the right of way to such boats and vessels.

§ 92.83 Small craft.

(a) Motorboats as defined by section 1 of an act of Congress approved April 25, 1940 (54 Stat. 163; 46 U.S.C. 526), shall be considered amenable to the provisions of §§ 92.25 to 92.31, inclusive, 92.35, 92.79, and 92.81.

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*Corrected to De Tour.

(b) Sail vessels under 10 gross tons shall be considered amenable to the provisions of §§ 92.25 to 92.31, inclusive and 92.35.

PART 110—ANCHORAGE REGULATIONS

§ 110.1 General.

(a) The areas described in Sub-part A of this part are designated as special anchorage areas pursuant to the authority contained in an act amending laws for preventing collisions of vessels approved April 22, 1940 (54 Stat. 150); Article 11 of section 1 of the act of June 7, 1897, as amended (30 Stat. 98; 33 U.S.C. 180), Rule 9 of section 1 of the act of February 8, 1895, as amended (28 Stat. 647; 33 U.S.C. 258), and Rule Numbered 13 of section 4233 of the Revised Statutes as amended (33 U.S.C. 322). Vessels not more than 65 feet in length, when at anchor in any special anchorage area, shall not be required to carry or exhibit the white anchor lights required by the Navigation Rules.

(b) The anchorage grounds for vessels described in Subpart B of this part are established, and the rules and regulations in relation thereto adopted, pursuant to the authority contained in section 7 of the act of March 4, 1915, as amended (38 Stat. 1053; 33 U.S.C. 471).

(c) All bearings in the part are referred to true meridian.

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Subpart A—Special Anchorage Areas

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§ 110.8 Lake Champlain, N.Y. and Vt. (See § 110.1.)

(a) *Ticonderoga, N.Y.* An area shoreward of a line bearing 312° from Ticonderoga Light to the southeast corner of the New York State Boat Launching Ramp.

(b) *Essex, N.Y.* A small cove at the westerly side of Lake Champlain, shoreward of a line connecting the offshore ends of two promontories located at Essex.

(c) *Shelburne, Vt.* An area shoreward of a line bearing 142° from the eastern point of Collymer Pt. to Allen Hill.

(c-1) *Shelburne Bay.* Beginning at a point on the shoreline at latitude 44°25′53.0″ N., longitude 73°14′47.3″ W.; thence north to a point at latitude 44°26′04.8″ N., longitude 73°14′46.6″ W.; thence northwesterly to a point on the shoreline at latitude 44°26′06.9″ N., longitude 73°14′50.2″ W.; thence along the shoreline to the point of beginning.

(d) *Mallets Bay, Vt.* The southwesterly portion of Mallets Bay, south of Coates Island and west of a line bearing 170° from the most easterly point of Coates Island to the mainland.

(e) *Mallets Bay, Vt.* An area in the northwesterly portion of Mallets Bay, south of a line extending from the northeasterly end of Mallets Head to the northeasterly end of Marble Island, and west of a line extending from the northeasterly end of Marble Island to the northeasterly side of Cave Island, and southerly to the point on the lower east side of Mallets Head.

(f) *St. Albans Bay, Vt.* An area in the northerly portion of St. Albans Bay westward of the State Pier at St. Albans Bay State Park, northeasterly of a line bearing 296°30′ from the southwesterly corner of the State Pier, and southeasterly of a line parallel to and 500 feet west of the west side of the State Pier.

§ 110.78 Sturgeon Bay, Sturgeon Bay, Wis. (See § 110.1.)

(a) *Area 1.* Beginning at a point bearing 126°, 3,000 feet from the fixed green Sturgeon Bay Canal Leading Light mounted on the highway bridge; thence 120°, 1,200 feet, this line being parallel to and 150 feet from the channel edge; thence 222°, 500 feet; thence 300°, 1,200 feet; thence 042°, 500 feet to the point of beginning.

(b) *Area 2.* Beginning at a point 160 feet from the shoreline and on the east line of 15th Avenue extended; thence south 530 feet to a point 100 feet from the northern edge of the channel; thence southeasterly 2,350 feet along a line parallel to the northern edge of the channel to a point on the east line of 18th Avenue extended, using that portion of 18th Avenue that runs in a true north-south direction perpendicular to Utah Street; thence north 530 feet along this line of 18th Avenue extended to a point approximately 400 feet from the shoreline; thence northwesterly 2,350 feet along a line parallel to the northern edge of the channel to the point of beginning.

§ 110.79 Port Washington Harbor, Port Washington, Wis. (See § 110.1.)

The area in the northerly end of the outer basin of Port Washington Harbor, commencing at the shoreward face of the north breakwater, 1,076.4 feet northwest of the lakeward end; thence on a bearing 277°42′27″, 1,220 feet more or less to the shoreline; thence north and northeast approximately 970 feet to the intersection with the shore end of the north breakwater; thence lakeward approximately 1,100 feet along the shoreward face of the north breakwater to the point of beginning.

NOTE: This area is principally for use by yachts and other recreational craft. The anchoring of vessels and the placing of temporary moorings is under the jurisdiction, and at the discretion, of the Port Washington Harbor Commission.

§ 110.79a Neenah Harbor, Neenah, Wis. (See § 110.1.)

The area of Neenah Harbor south of the main shipping channel within the following boundary: A line beginning at a point bearing 117.5°, 1,050 feet from the point where the southeasterly side of the First Street/Oak Street Bridge crosses the south shoreline of the river; thence 254°, 162 feet; thence 146°, 462 feet; 164°, 138 feet; 123°, 367 feet; 068°, 400 feet; 044°, 400 feet; thence 320°, 107 feet; thence 283°, 1,054 feet to the point of beginning.

NOTE: An ordinance of the city of Neenah, Wis., requires approval of the Neenah Police Department for the location and type of individual moorings placed in this special anchorage area.

§ 110.80 Milwaukee Harbor, Milwaukee, Wis. (See § 110.1.)

(a) *McKinley Park.* The water area east of McKinley Park enclosed by a line beginning at McKinley Park Jetty

Light; thence 090° 500 feet to a point on the breakwater; thence northerly and northwesterly following the breakwater, piers, jetty and natural shoreline to the point of beginning.

(b) *South Shore Park.* The water area northeast of South Shore Park enclosed by a line beginning at the northeast corner of the jetty at latitude 43°00'07.5'' N., longitude 87°53'08'' W.; thence to latitude 43°00'05'' N., longitude 87°53'01'' W.; thence to latitude 42°59'55'' N., longitude 87°52'53'' W.; thence to latitude 42°59'40'' N., longitude 87°52'33.5'' W.; thence to a point of the shoreline at latitude 42°59'34'' N., longitude 87°52'43.5'' W.; thence following the shoreline to the point of beginning.

(c) *Bay View Park.* The water area east of Bay View Park enclosed by a line beginning on the shoreline at latitude 42°59'28.5'' N., longitude 87°52'35'' W.; thence to latitude 42°59'35.5'' N., longitude 87°52'27'' W.; thence to latitude 42°59'08'' N., longitude 87°51'37'' W.; thence to a point on the shoreline at latitude 42°58'59'' N., longitude 87°51'46'' W.; thence following the shoreline to the point of beginning.

NOTE: An ordinance of the City of Milwaukee, Wisconsin requires the approval of the Milwaukee Harbor Master for the location and type of moorings placed in these special anchorage areas.

§ 110.80a Lake Macatawa, Mich. (See § 110.1.)

An area located on the south side of Lake Macatawa near the entrance to Lake Michigan, shoreward (south) of a line commencing offshore of Macatawa Park at a point 960 feet S 156° E from the light on the south pier at the entrance to the Lake, and extending 1,550 feet N 82° E toward the northwest corner of the Macatawa Bay Yacht Club pier.

§ 110.81 Muskegon Harbor, Mich. (See § 110.1.)

The waters on the southwest side of Muskegon Lake shoreward of a line beginning at the intersection of the north line of Arlington Avenue and the east line of Edgewater Street, and bearing thence 145°, 2,110 feet, and thence 230° to the shore.

§ 110.82 Charlevoix Harbor, Mich. (See § 110.1.)

The waters on the north side of Round Lake northward of a line beginning at a point approximately 200 feet south of the north shore bearing 60°, 280 feet, from the northeast corner of the Charlevoix Municipal Wharf, and bearing thence 92°, 400 feet, thence 129°, 1,160 feet, and thence 110° to the westerly end of the southwest side of Park Island.

§ 110.83 Chicago Harbor, Ill. (See § 110.1.)

(a) *Grant Park North.* Beginning at a point 2,700 feet south of the south face of the Naval Armory Dock and 100 feet east of the Grant Park bulkhead along the west side of the harbor, said bulkhead at that point being approximately on the harbor line approved by the Department of the Army on August 3, 1940; thence north along a straight line parallel to said harbor line and to the overall alinement of said Grant Park bulkhead between its north and south ends, 1,460 feet to a point that is 100 feet east of said harbor line and 150 feet east of the Grant Park bulkhead; thence east at a right angle, 150 feet; thence north at a right angle, parallel to the first described line, passing 100 feet east of the Chicago Yacht Club dock, 693 feet; thence east at a right angle, 75 feet; thence north parallel to and 375 feet east of aforesaid Grant Park bulkhead, 390 feet; thence east at a right angle, 385 feet; thence north at a right angle 97 feet to a point 760 feet east of said Grant Park bulkhead (or 710 feet east of said harbor line) and 60 feet south of a line drawn east at a right angle thereto, from the north end of said Grant Park bulkhead at the south face of said Naval Armory Dock; thence east perpendicular to said Grant Park bulkhead, 840 feet; thence southerly 2,415 feet to a point 1,500 feet east of said harbor line and about 1,505 feet east of said Grant Park bulkhead; thence southwesterly 740 feet to a point 700 feet due east, in a direction perpendicular to the west line hereof, from the point of beginning; and thence west to the point of beginning.

(b) *Grant Park South.* Beginning at a point 3,000 feet south of the south face of the Naval Armory Dock and 100 feet east of the Grant Park bulkhead along the west side of the harbor, said bulkhead at that point being approximately on the harbor line approved by the Department of the Army on August 3, 1940; thence east, perpendicular to the overall alinement of the Grant Park bulkhead and perpendicular to said harbor line, 700 feet; thence southeasterly 697 feet to a point 1,460 feet east of said Grant Park bulkhead and 225 feet south of an extension of the first described line; thence south perpendicular to the first described line, 225 feet; thence southwesterly 2,235 feet along a line generally 150 feet northwesterly from and parallel to the northwesterly face of the narrow section of the U.S. Inner Breakwater; thence northwesterly 190 feet to a point 150 feet east of said Grant Park bulkhead (or 100 feet east of the aforesaid harbor line) and 5,140 feet south of the south face of the Naval Armory Dock; and thence north 2,140 feet to the point of beginning.

NOTE: The Chicago Park District controls the location and type of any moorings placed in the special anchorage areas in this section.

§ 110.84 Black Rock Channel opposite foot of Porter Avenue, Buffalo, New York. (See § 110.1.)

An area extending northwesterly between Black Rock Channel and Bird Island Pier opposite the foot of Porter Avenue, bounded as follows: Beginning at Triangulation Marker "N-5" on Bird Island Pier; thence southeasterly along the pier a distance of approximately 745 feet; thence 60°52' true, approximately 300 feet to a point 50 feet westerly of the westerly limit of Black Rock Channel; thence northwesterly along an arc of a circle parallel to and 50 feet westerly of the westerly limit of the channel to a point approximately 360 feet southerly of Bird Island Pier Light No. 17; thence 276°20' true, approximately 135 feet to Bird Island Pier; thence southwesterly and southerly along the pier a distance of approximately 1,355 feet to the point of beginning. (See § 110.1.)

§ 110.84a Put-In-Bay, Ohio.

The area in Put-In-Bay, Ohio commencing at a point 283° true 450 feet from Put-In-Bay Dock Light; thence 008°, 850 feet; thence 254°, 900 feet; thence 193°, 400 feet; thence 126°, 420 feet; thence 085°, 500 feet to the point of origin. The area is further divided into two areas. Area I lies east of and Area II lies west of the line commencing at the southwest corner adjacent to Put-In-Bay Buoy 4 running 013° to the mid-point of the northern boundary.

Note.—Area I is for boats anchoring using their own anchoring gear excluding mooring buoys; Area II is for boats using their own anchoring gear and boats moored to authorized mooring buoys. Authorization for placement of mooring buoys in Area II is required from the District Engineer, U.S. Army Corps of Engineers, Box 1027, Detroit, Michigan.

§ 110.84b Buffalo, N.Y.

The area within the Port of Buffalo known as Port of Buffalo Small Boat Harbor commencing at a point on shore at latitude 42°51′05″N., longitude 78°51′55″W.; thence 240° to riprap dike thence following the dike to the shoreline; thence along the shoreline to the point of origin.

NOTE.—Permission must be obtained from the Niagara Frontier Transportation Authority, Marine Division, before any vessel is moored or anchored in this special anchorage area.

§ 110.85 Niagara River, Youngstown, N.Y. (See § 110.1.)

Beginning at the intersection of the north line of Jackson Street extended with the east shoreline of the Niagara River; thence westerly along the north line of Jackson Street extended 700 feet; thence southerly along lines parallel to Main Street approximately 4,035 feet to the south line of Swain Street extended; thence easterly along the south line of Swain Street extended to the shoreline; thence northerly along the shoreline, 1,855 feet to the south end of the Pierce Marine Co. pier; thence west 260 feet; thence northerly along a line parallel to Main Street for 1,525 feet to the north line of William Street extended; thence easterly along this line to the shoreline; thence northerly 775 feet along the shoreline to the point of beginning, excepting therefrom, a 100-foot-wide area extending through the special anchorage area, southerly of a line bearing 300° from the southwesterly corner of the Pierce Marine Co. pier at 555 Water Street, and a 150-foot-wide area extending through the special anchorage area from the Old Fort Niagara Yacht Club dock, whose centerline describes a line bearing 296.5° to the Niagara-on-the-Lake Front Range light (latitude 43°15.3′ N., longitude 79°03.7′ W.). These fairways will be maintained in order to permit the free movement of vessels to and from the above named organizations' docking facilities. This area is designated a special anchorage area subject to the condition that such buoys as may be prescribed by the U.S. Coast Guard to mark the area shall be provided and maintained by and at the expense of local interests.

§ 110.86 Sodus Bay, New York. (See § 110.1.)

The water area in Sodus Bay, New York, south of Sand Point beginning at a point on the shoreline at latitude 43°16′07″ N., longitude 76°58′47″ W.; thence southwesterly to latitude 43°15′55″ N., longitude 76°59′00″ W.; thence easterly to latitude 43°15′52″ N., longitude 76°-58′34″ W.; thence northerly to a point on the shoreline at latitude 43°15′58″ N., longitude 76°58′34″ W.; thence along the natural shoreline and structures to the point of beginning.

NOTE: An ordinance of Wayne County, New York, requires the permission of the Wayne County Sheriff before any vessel is moored or anchored in this special anchorage area.

§ 110.87 Henderson Harbor, New York. (See § 110.1.)

(a) *Area A.* The area in the southern portion of Henderson Harbor west of the Henderson Harbor Yacht Club bounded by a line beginning at the point of land, approximately 150 feet west of the Graham Creek Range Rear Light; thence 180°, 50 feet; thence 275°, 810 feet; thence 000°, 1,500 feet; thence 090°, 700 feet; thence 177°, 1,250 feet to the point of land approximately 160 feet west of the Graham Creek Range Forward Light; thence along the shoreline to the point of beginning.

(b) *Area B.* The area in the southern portion of Henderson Harbor north of Graham Creek Entrance Light bounded by a line beginning at a point 000°, 1000 feet from Graham Creek Entrance Light; thence 357°, 1,200 feet; thence 090°, 400 feet; thence 172°, 1,200 feet; thence 270°, 500 feet to the point of beginning.

NOTE: Permission must be obtained from the Town of Henderson Harbormaster before any vessel is moored or anchored in this special anchorage area.

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Subpart B—Anchorage Grounds

* * * * *

§ 110.205 Chicago Harbor, Ill.

(a) *The anchorage grounds*—(1) *Anchorage A, exterior breakwater.* Southwest of a line parallel with and 150 feet southwestward of the exterior breakwater; west of a line parallel with and 150 feet west of the south extension of the exterior breakwater; northeast of a line parallel with and 1,500 feet southwestward of the exterior breakwater; and east of a line parallel with the south extension of the exterior breakwater and 500 feet eastward of the east face of the filtration plant.

(2) *Anchorage B, south arm.* West of a line parallel with and 150 feet west of the south arm of the exterior breakwater; north of a line perpendicular to the south arm at its south end; east of a line parallel with the south arm, about 2,200 feet therefrom and on line with the east face of the Municipal Pier; and south of a line perpendicular to the south arm 700 feet from its north end.

(3) *Anchorage C, shore arm.* South of a line parallel with and 150 feet southward of the shore arm of the exterior breakwater; west of a line parallel with the south extension of the exterior breakwater, 100 feet westward

of the east end of the shore arm; northwest of a line perpendicular to the Lake Shore Drive revetment and 300 feet northwest of the northwest corner of the filtration plant; and east of a line parallel with and 600 feet lakeward of the Lake Shore Drive revetment.

(4) [Reserved]

(5) [Reserved]

(6) *Anchorage F, Filtration Plant Slip.* South of the south face of the filtration plant; west of the east face of the filtration plant; north of a line 80 feet south of the south face of the filtration plant; and east of a line 1,400 feet west of the east face of the filtration plant.

(b) *The rules and regulations.* (1) Except in cases of emergency, no vessel may be anchored in Chicago Harbor outside of the anchorage grounds in paragraph (a) of this section or the special anchorage areas prescribed in § 110.83.

(2) Anchors must not be placed outside the anchorage areas, nor shall any vessel be so anchored that any portion of the hull or rigging shall at any time extend outside the boundaries of the anchorage area.

(3) Any vessel anchoring under circumstances of great emergency outside of the anchorage areas must be placed near the edge of the channel and in such position as not to interfere with the free navigation of the channel nor obstruct the approach to any pier nor impede the movement of any boat, and shall move away immediately after the emergency ceases, or upon notification by the Captain of the Port.

(4) The maneuvering of a vessel by means of a dragged anchor, except within an established anchorage ground or in stress of weather or to avoid collision, is prohibited. Unnecessary maneuvering in any of the anchorage grounds is prohibited.

(5) The directions of the Captain of the Port assigning vessels to parts of the anchorage grounds suitable to their draft, requiring vessels to anchor bow and stern, requiring shifting the anchorage of any vessel within any anchorage ground for the common convenience, or for otherwise enforcing this section, shall be promptly executed by owners, masters, and persons in charge of vessels.

(6) Nothing in this section shall be construed as relieving the owner or person in charge of any vessel from the penalties of the law for obstructing navigation or for obstructing or interfering with range lights, or for not complying with the navigation laws in regard to lights, fog signals, or for otherwise violating law.

(7) No vessel may use anchorages A, B, and F except commercial vessels operated for profit. No person may place floats or buoys for marking moorings or anchors in place in anchorages A and B. No person may place fixed mooring piles or stakes in anchorages A and B. (Mooring facilities are available along the south side of the filtration plant in anchorage F.)

(8) No commercial vessels operated for profit that measure 50 gross tons or more may anchor in anchorage C. Temporary floats or buoys for marking moorings or anchors in place may be used in anchorage C. No person may place a fixed mooring pile or stake in anchorage C.

§ 110.207 Cleveland Harbor, Ohio.

(a) *The anchorage grounds*—(1) *West anchorage.* The northwesterly portion of the West Basin between the northwest limits of the West Basin and a line parallel to and 1,050 feet distant from the West Breakwater; and from the southwest limits of the West Basin to a line perpendicular to the West Breakwater, 2,050 feet southwesterly along the West Breakwater from Cleveland West Breakwater Light.

(2) *East anchorage.* The southeasterly portion of the East Basin between the mainland and a line parallel to and 1,250 feet distant from the East Breakwater; from opposite Cleveland East Entrance Light to a due north line passing through the flashing white light on the Allied Oil Company dock.*

(3) *Explosives anchorage.* In Lake Erie, northwest of Cleveland Harbor East Breakwater, and including a rectangular area marked by four white spar buoys at the following true bearings and distances from Cleveland East Pierhead Light: 38°30′, 2,050 feet; 68°, 2,050 feet; 57°, 7,050 feet; and 49°, 7,050 feet.

(b) *The regulations.* (1) The west and east anchorages are general anchorages.

(2) Use of the explosives anchorage shall be subject to the supervision of the Captain of the Port.

§ 110.208 Buffalo Harbor, N.Y.

(a) *The anchorage grounds*—(1) *Explosives Anchorage A.* Inside the south section of the main breakwater 700 feet wide starting at a point 500 feet southerly from the south end of the north section and extending approximately 153° true 3,000 feet parallel to the line of the south section of the main breakwater.

(2) *Explosives and Inflammables Anchorage B.* The area bounded by a line extending from the South Buffalo Pier Head Light 180° true, 2,000 feet; thence 270° true, 2,000 feet; thence due north, 2,000 feet; and thence 90° true, 2,000 feet.

(b) *The regulations.* (1) Both anchorages may be used either day or night.

(2) Anchorage B is intended primarily for explosives loading, but when no such loading is being carried on therein it may be used for the transfer of inflammables.

PART 117—DRAWBRIDGE OPERATION REGULATIONS

§ 117.1 General

(a) The operation of drawbridges, in the absence of specific regulations in this part, shall be as required by section 5 of the act of August 18, 1894, as amended (28 Stat. 362; 33 U.S.C. 499). It shall be the duty of persons owning, operating, and tending drawbridges built across navigable waters of the United States, to open, or cause to be opened, the draws of such bridges under such rules and regulations as in the opinion of the Commandant the public interests require. Insofar as criminal liability on

*The westerly limit of the anchorage area is no longer marked by the Allied Oil Company dock light. The line defined lies approximately on meridian 81°40′34″.

the part of the bridge owner is concerned, the Commandant is of the opinion that, in the absence of Federal regulations, there is no Federal authority requiring the opening of any drawbridge to which the General Bridge Act of March 23, 1906, does not apply. With reference to the civil liability of the bridge owner, however, it has been held that the duty to take proper care of a bridge includes the duty to make proper provision for the passage of vessels through the draw. In constructing a bridge with a draw, and in undertaking to open and manage the draw so as to allow vessels to pass, the owner has recognized the right of vessels to pass through without any appeal to the national authority to protect that right. Having thus recognized the rights of commerce, and undertaken to provide accommodations for the passage of vessels, the owner is bound that the custodians of the bridge shall use ordinary diligence to avoid accidents to vessels going through the draw at customary hours, and in the customary manner, as one of the incidents of the care, management, and control of the bridge itself. The owner is responsible, therefore, for the want of ordinary care and diligence in his servants, and for the consequent damage.

(b) The Attorney General has held (Jan. 28, 1899; 22 Opin. 314) that the first part of section 5 of the 1894 act is merely declaratory of the legal duty of the owners or operators which attaches to the maintenance and operation of a drawbridge across navigable waters. "It is the duty of all persons operating such drawbridges to open or cause them to be opened in a reasonable manner and at a reasonable time, consistent with the uses for which drawbridges are constructed, for the passage of vessels. The repair of such draws and of the bridges with which they are connected is also necessary for their maintenance. It is reasonable that a sufficient time should be allowed for such repairs and if they cannot be prosecuted without closing the bridge for a number of successive days, such closing cannot be considered an unreasonable interference with navigation." "It is entirely competent for the Secretary of the Army to make rules and regulations governing this subject, but in the absence of such rules and regulations the law is as I have above stated it." (The Commandant prescribes these rules and regulations.)

(c) Notwithstanding any general or special regulation heretofore or hereafter prescribed, drawbridges across navigable waters of the United States will not be opened to navigation for certain periods determined by the proper civil defense authorities to be in the interest of public safety during a major disaster or civil defense emergency indicated by a civil defense condition of "Air Raid Warning" (attack by enemy aircraft probable, imminent, or taking place).

(d) As used in this part, the term "long blast" means a distinct blast of a whistle, horn, siren, or other efficient sound producing device, of approximately three (3) seconds' duration. The term "blast" or "short blast" means a distinct blast of one (1) second's duration, or where specified, a distinct stroke of a bell.

(e) The Commandant may require the owner or operator to install and operate a radiotelephone station or stations of appropriate characteristics on a drawbridge when he finds that for navigation or safety it is essential that in addition to the use of sound or visual signals prescribed a supplemental means be available by which vessels may communicate to confirm requests for opening of the draw as well as exchange information with the drawtender concerning the condition of the draw or governing its operation.

(1) The Commandant's determination is based on such factors as location and navigational clearance of the particular bridge, character and volume of marine traffic, configuration of the navigational channel, restrictions in channel approaches, currents in the approaches to or through the drawbridge, obstructions and conditions limiting visibility, and similar conditions affecting navigation or safety through or in the vicinity of the drawbridge.

(2) Each station shall be subject to the rules and regulations of the Federal Communications Commission or the Director of Telecommunications Management as applicable governing the assignment of operating frequencies, licensing, and operation of radiotelephone stations.

(3) When the Commandant proposes that a radiotelephone station, or stations, be installed and operated on a specific drawbridge, he gives written notice of the proposed requirement to the bridge owner (or operator as appropriate) who shall have 30 days in which to submit comments or objections to the proposal. If the Commandant determines that such installation is necessary the bridge owner (or operator) shall have a reasonable time, but normally not more than 6 months, in which to effect installation and commence operation.

(4) Radiotelephone communications pursuant to this section supplement the sound and visual signals prescribed elsewhere in this part for the operation of drawbridges in general or for specific bridges and do not alter any obligation with respect to their use. The provisions of this section are not intended to restrict the voluntary installation and operation of radiotelephone stations on drawbridges.

§ 117.1a Temporary departures from regulations in this part.

(a) *Temporary closures of drawbridges.* Notwithstanding any general or special regulation in this part, heretofore or hereafter prescribed, a specific drawbridge across navigable waters of the United States need not be open to navigation for specified periods of time when such a bridge may be undergoing repairs or maintenance work or when the public interest, health, or safety so requires.

(b) *Delegation to District Commanders.* The Commandant further delegates pursuant to 49 CFR 1.4(g) to District Commanders authority to place in effect the provisions of paragraph (a) of this section with respect to drawbridges in their respective Coast Guard Districts for periods of time determined to be necessary but in no event to exceed 60 consecutive calendar days. For a specific drawbridge the District Commander having jurisdiction may suspend any drawbridge operation regulations applicable thereto and if necessary establish other operational

requirements without prior notice and public procedures thereon for such actions. Where practicable, notice of the District Commander's actions taken pursuant to this section shall be disseminated in Notices to Mariners, or otherwise, for the information of all concerned.

(c) *Closure for repairs or maintenance.* (1) When a draw must be closed for scheduled repairs or maintenance work, approval of the District Commander should be obtained at least 10 days prior to the date of the intended closure by the owners of or the agency controlling the drawbridge. The request for approval of the proposed closure shall include a brief description of the nature of the work to be performed and the times and dates of such closure. The granting of the approval will depend upon the necessity for the closure, the reasonableness of the time(s) and date(s) requested, and the overall effect on navigation.

(2) When a draw is closed for repairs in case of emergency or damage to the structure or for vital maintenance that may not be delayed, the owners of or the agency controlling the drawbridge shall immediately inform the District Commander concerned of the closure, the reasons for the closure, and the expected completion date of the emergency repairs. Normally, the extension of any period of emergency closure to include the accomplishment of routine maintenance or for other nonemergent purposes will not be authorized.

(d) *Closure for public interest, health, and safety.* In situations where the public interest, health, or safety so requires, including the holding of public functions or events such as street parades and marine regattas, the District Commander may authorize the temporary closure of a drawbridge. A request for approval of a temporary closure of a drawbridge for a street parade or marine regatta or otherwise should include a brief description of the proposed event or reason why closure of the drawbridge is desired, and the time and date of such closure. The closure of a drawbridge for public interest, health, or safety will depend upon the necessity for the closure, the reasonableness of the time and date (if requested), and the overall effect on navigation.

(e) *Closure of draw for emergency vehicles.* When a drawtender is informed by a reliable source that an emergency vehicle is due to cross the draw, he shall take all reasonable measures necessary to have the draw closed at the time the emergency vehicle arrives at the bridge.

§ 117.185 Hudson River, N.Y.; bridges at Albany and Troy.

(a) Except as provided in paragraph (h) of this section, the draws of each of the bridges shall be opened promptly when the prescribed signal for the opening of the draw is received from an approaching vessel which cannot pass under the closed draw.

(b) The draw of any bridge shall not be required to remain open for the passage of vessels for a period longer, consecutively, than 15 minutes. Upon being closed it may remain closed for a time sufficient to allow delayed land traffic to pass, but in no case for a period longer, consecutively, than 10 minutes if a vessel desires to pass, unless at the expiration of such period a train in motion having passed the derailing point is approaching the draw, which train shall be permitted to pass before opening of the draw: *Provided*, That no train shall be stopped on the bridge between the derailing points except in a case of great emergency, after which the draw shall be opened promptly for any vessel desiring to pass: *Provided further*, That these limitations shall not apply to any vessel of more than 500 tons burden, to any tug with a tow on a hawser, to single tows which require longer than 15 minutes to pass through the draw, or to vessels downbound during a freshet whose height exceeds an elevation determined upon by the District Commander.

(c) The length of time that a draw has been opened shall be computed from the time that the drawspan begins to move in opening, and the length of time that a draw has been closed shall be computed from the time that the drawspan ceases to move in closing.

(d) Vessels with tows shall not so approach a bridge as to attempt to pass the draw in succession without interval. They shall arrange their approach so as to cause no delay in closing the draw promptly for the relief of land traffic.

(e) The draw of a bridge shall not be required to be opened for the passage of vessels habitually using the river which have stacks, jack staffs, or flagstaffs exceeding 21 feet in height above the water line and which are otherwise capable of clearing the bridge when closed. If such vessels wish to pass the bridge the stacks, jack staffs, or flagstaffs must be so erected that they may be lowered to permit the passage under the bridge. Any tug or vessel passing the draw of a bridge as often as once a day for 10 consecutive days of any month shall be regarded as using the river habitually within the meaning of this paragraph. A failure to comply with such requirement by any tug or vessel after one warning by the owner of or agency controlling any of the bridges shall be sufficient cause for a refusal to open the draw for the accommodation of such tug or vessel until such later time as may be convenient to the owner of or agency controlling the bridge.

(f) Vessels which are owned or controlled by the United States or by the police or fire departments of any of the neighboring cities or villages shall be passed without delay through the draws of any of the bridges on identification of such vessels.

(g) *Signals*—(1) *Call signals for opening of draw.* By vessels bound north: Three long blasts of the whistle or horn. By vessels bound south: Three long blasts followed by one short blast of the whistle or horn. If a vessel desires to pass through more than one bridge the call signal shall be repeated for each bridge. Private signals of towing or steamboat companies which may be mistaken by a bridge tender for call signals shall not be used.

(2) *Acknowledging signals by the bridge operator*—(i) *All bridges.* If the draw is to be opened, three long blasts of a whistle or horn. If the draw cannot be opened in time for the vessel to pass through safely, five short blasts of a whistle or horn.

(ii) *Additional visible signals to be displayed by the bridges at Albany.* The day signal shall be displayed at least 15 feet above the fixed day signal at the middle point of the drawspan and so as to be visible from both sides of the bridge. The night signal shall be displayed at least 15 feet above the fixed light at the center of the draw. The "fixed" signals referred to are those required by the regulations for lighting bridges prescribed by the United States Coast Guard (see Part 68 of this title). By day, if the draw is to be opened, the visible signal shall be a round ball not less than three feet in diameter and painted green, and if the draw is not to be opened, the visible signal shall be a lattice-work barrel-shaped sign five feet six inches high and four feet in diameter and painted red. By night, if the draw is to be opened, the visible signal shall be a green light from a standard marine lamp, and if the draw is not to be opened, the visible signal shall be a red light from a standard marine lamp.

(h) The general regulations contained in paragraphs (a) to (g), inclusive, of this section shall apply to all bridges except as modified by special regulations contained in this paragraph.

(1) [Reserved]

(2) [Reserved]

(3) ‡*New York Central Freight Bridge.* The draw need not be opened for the passage of vessels during the period from December 16 to March 31, unless notice has been given 24 hours in advance of the time a vessel may be expected to pass through.

(4) [Reserved]

(5) [Reserved]

(6) *Troy-Green Island Bridge.* The draw need not be opened for the passage of vessels during the period from December 16 to March 31 of each year. From April 1 to December 15, inclusive, of each year, openings will be made for the passage of vessels except during the hours of 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.: *Provided,* That the draw need not be opened between 6:00 p.m. and 7:00 a.m. unless notice has been given before 4:30 p.m. of the time a vessel may be expected to pass through.

(7) *112th Street Bridge.* The draw need not be opened for the passage of vessels during the period that the Federal Lock at Troy in inoperative: *Provided,* That provision is made for emergency operation of the bridge with the least possible delay upon receipt of oral or written notice. During the balance of the year, the bridge shall be opened for the passage of vessels except during the hours of 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.: *Provided,* That the draw need not be opened between 6:00 p.m. and 7:00 a.m. unless notice has been given before 4:30 p.m. of the time a vessel may be expected to pass through.

NOTE: The time specified in all cases is eastern daylight saving or eastern standard time, whichever is in force.

‡Penn Central and used for passenger service.

§ 117.190 Navigable waters in the State of New York and their tributaries; bridges where constant attendance of draw tenders is not required.

(a) The owners of or agencies controlling the bridges listed in paragraph (f) of this section will not be required to keep draw tenders in constant attendance.

(b) Whenever a vessel unable to pass under a closed bridge desires to pass through the draw, advance notice, as specified, of the time the opening is required shall be given to the authorized representative of the owner of or agency controlling the bridge.

(c) Upon receipt of such advance notice, the authorized representative of the owner of or agency controlling the bridge, in compliance therewith, shall arrange for the prompt opening of the draw at the time specified in the notice for the passage of the vessel.

(d) The owners of or agencies controlling the bridges shall keep conspicuously posted on both the upstream and downstream sides thereof, in such manner that it can easily be read at any time, a copy of the regulations in this section together with a notice stating exactly how the representative specified in paragraph (b) of this section may be reached.

(e) The operating machinery of the draws shall be maintained in a serviceable condition, and the draws shall be opened and closed at intervals frequent enough to make certain that the machinery is in proper order for satisfactory operation.

(f) The bridges to which this section applies, and the regulations applicable in each case, are as follows:

* * * * *

(1) The draws of the following bridges need not open for the passage of vessels and the provisions of paragraphs (b) through (e) of this section shall not apply to these bridges.

* * * * *

(viii) Hudson River; State of New York highway (Troy-Menands) bridge between Albany and Rensselaer Counties.

(2) Wappinger Creek; Penn Central Railroad bridge at New Hamburg. The draw shall open on signal from 11:30 a.m. to 7:30 p.m. from May 15 through October 15. At all other times the draw shall open on signal if at least 12 hours notice is given to the Chief Train Dispatcher, Penn Central Railroad Company, New York, N.Y.

(3) (Revoked)

(4) (Revoked)

(5) Tonawanda Creek; Penn Central Railroad Company bridge between Tonawanda and North Tonawanda. From December 16 through March 31, the draw shall open on signal if at least 12 hours notice is given. From April 1 through December 15, the draw shall open on signal and shall be left in the fully open position whenever a drawtender is not in attendance.

(6) Tonawanda Inner Harbor (Little River); Penn Central Railroad Company bridge between Island Street, North Tonawanda, and Tonawanda Island. The draw shall open on signal if at least 24 hours notice is given.

§ 117.191 Navigable waters in the State of Vermont and their tributaries; bridges when constant attendance of draw tenders is not required.

(a) Lake Champlain; Vermont Department of Highways bridge across entrance to Missisquoi Bay, between Alburg Tongue and Hog Island, at East Alburg. The draw shall open on signal if at least 24 hours notice is given.

(b) Lake Champlain; Missisquoi Bay, Central Vermont railroad bridge. The draw shall open on signal from June 1 through September 30 from 7 a.m. to 11 p.m. At all other times the draw shall open on signal if at least 24 hours notice is given to Central Vermont Railway, Inc., St. Albans, Vermont 05478.

(c) Lake Champlain; Vermont Department of Highways bridge between Sandy Point, Grand Isle (South Hero Island) and Knights Point, North Hero Island.

(1) From May 15 through October 15, the draw shall open on signal from 7 a.m. to 9 p.m.

(2) From May 15 through October 15, the draw shall open on signal from 9 p.m. to 7 a.m. if at least four hours notice is given.

(3) From October 16 through May 14, the draw shall open on signal if at least 24 hours notice is given.

(4) During periods of advance notice requirements, the draw shall open as soon as possible for public vessels of the United States.

(d) The owners of or agencies controlling these bridges shall keep a copy of the regulations in this section pertaining to each bridge, and a notice stating how the advance notices required by this section, are to be given. This notice shall be conspicuously posted on both the upstream and downstream sides of the bridge.

§ 117.604 Illinois River-Automated Burlington Northern Railroad Bridge at Beardstown, Ill.

(a) The liftspan of the railroad bridge, mile 88.8, at Beardstown, Ill., will normally be maintained in the open position, providing a minimum vertical clearance of 68.4 feet above normal pool.

(1) When a vessel is approaching, and the liftspan is in the open position, contact shall be established by radiotelephone with the remote operator to assure that the liftspan will remain open until passage has been completed.

(2) When a vessel is approaching, and the liftspan is in the closed position, contact shall be established by radiotelephone with the remote operator. If the liftspan CANNOT be opened promptly, alternate flashing red lights shall then be displayed. If the liftspan SHALL open promptly, flashing amber lights shall be displayed.

(3) When a train approaches the bridge and the liftspan is in the open position, alternate flashing red lights on top of the drawspan shall commence flashing and a horn shall sound four short blasts. The remote operator shall scan the river on radar to determine whether any vessels are aproaching the bridge. The remote operator shall also broadcast his intentions to lower the liftspan. If a vessel or vessels are approaching the bridge within 1 mile, as determined by radar scanning, response to radio broadcast, or electronic detector, the flashing red lights shall be changed to flashing amber and the liftspan remain in the fully open position until such vessel or vessels have cleared the bridge. If no vessels are approaching the bridge or are beneath the liftspan, the alternate flashing red lights shall continue to flash and the liftspan shall be lowered and locked in place.

(4) After the train has cleared the bridge, the draw shall be raised to its full height and locked in place; the red flashing lights will stop and drawspan lights changed from red to green indicating the navigation channel is clear for the passage of vessels.

(b) The owner of or agency controlling this bridge shall keep the provisions of this regulation conspicuously posted on both the upstream and downstream sides of the bridge.

* * * * *

§ 117.605 Illinois Waterway, Ill.; bridges (highway and railroad) at Pekin, Peoria, and Joliet, Ill.

(a) The following special regulations are prescribed to govern the operation of the following bridges across the Illinois Waterway:

Mile	Bridge	Vertical clearance closed	
		Above high water	Above present low water
152. 9	Margaret Street Highway, Pekin, Ill.	9. 3	28. 4
153. 0	Peoria Terminal Company Railroad (C. R. I. & P. Ry.), Pekin, Ill.	2. 4	21. 6
162. 2	Illinois Terminal Railroad,* Peoria, Ill.	[1] 16. 1	[1] 34. 2
162. 2	Toledo, Peoria and Western Railroad, Peoria, Ill.	−0. 7	17. 4
162. 3	Lower Highway Bridge, Peoria, Ill.	[1] 13. 7	[1] 31. 8
287. 3	McDonough Street Highway Joliet, Ill.	16. 5	16. 5
287. 6	Chicago, Rock Island & Pacific Railway, Joliet, Ill.	9. 4	9. 5
287. 9	Jefferson Street Highway, Joliet, Ill.	16. 4	16. 6

[1] For 80-foot width of channel.

*Superstructure removed prior to 1967—Piers remain.

(b) When a vessel reaches a distance of about one-half mile from the Peoria Terminal Company Railroad bridge at Pekin, Illinois; the Toledo, Peoria, and Western Railroad bridge at Peoria, Illinois, and the Chicago, Rock Island, and Pacific Railway bridge, at Joliet, Illinois, a call signal of three long blasts of a whistle, horn, or siren, or

three loud and distinct strokes of a bell shall be sounded if the clearance requirements of the vessel are such that opening of the adjacent bridges at these respective cities is unnecessary: and if the draw is to be opened immediately, the acknowledging signal by the bridge operators on these railroad bridges shall be the same as the call signal; if the draw cannot be opened immediately, or if opened must be closed immediately, four or more short and rapid blasts of a whistle, horn, or siren, or four sharp and rapid strokes of a bell to be repeated at regular intervals until acknowledged by the vessel must be sounded.

(c) *Supplemental regulations.* (1) Except on Sundays the owner of or agency controlling the highway bridges in Joliet, Ill., listed below will not be required to open the draws between the hours of 7:30 a.m. and 8:00 a.m. and between the hours of 4:30 p.m. and 5:30 p.m.:

McDonough Street, Mile 287.3.
Jefferson Street, Mile 287.9.
Cass Street, Mile 288.1.
Jackson Street, Mile 288.4.
Ruby Street, Mile 288.7.

(2) The regulations in this paragraph will be effective until a high level fixed bridge is constructed across the Des Plaines River at Joliet, Illinois, and opened to highway traffic at which time the question of maintaining closed bridge hours will be reviewed by the Commandant.

NOTE: The regulations in paragraph (c) of this section will also be subject to review by the Commandant after one year with a view of determining whether they should be modified in any respect from actual experience gained.

§ 117.640a Duluth-Superior Harbor, Minnesota, and Wisconsin; bridges (highway and railroad).

(a) The regulations in this section shall govern the opening of the draws in the Duluth Ship Canal, Northern Pacific Railway, Grassy Point and Arrowhead bridges from March 16 to December 31.

(b) The owners of or agencies controlling the bridges shall provide necessary tenders and the proper mechanical appliances for the safe, prompt and efficient opening of the draws for the passage of vessels. The tender's house shall be high enough to clear trains, buses, trucks, or other vehicles, and allow the tender to see readily the channels in all directions.

(c) *Signals*—(1) *Call signals.* Call signals for opening of bridges are:

Duluth Ship Canal Bridge: 1 long, 1 short, 1 long, 1 short.

Northern Pacific Railway Bridge:
Minnesota Draw: 1 long, 2 short.
Wisconsin Draw: 2 long, 2 short.

Grassy Point Bridge: 2 short, 1 long.

Interstate.* (Old)

Arrowhead Bridge (Twin Ports): 3 long.

The duration of a long blast should not exceed 3 seconds, and a short blast should not exceed 1 second.

(2) *Acknowledging signals by bridge tenders.* (i) Each of the bridges listed in subparagraph (1) of this paragraph must be provided with a signal of sufficient strength of sound to be heard distinctly three-fourths of a mile in any condition of weather.

(ii) Upon receiving a signal for opening the draw the tender shall at once answer with a return signal, which shall be the same as the signal for opening, to indicate that the vessel signal has been heard. The tender shall take note of the vessel's position and speed, and open the bridge in time to allow the vessel to pass through. (See, however, subdivision (iii) of this subparagraph.)

(iii) In case the bridge, other than the Duluth Ship Canal Bridge (see subdivision (iv) of this subparagraph), is not ready to open at the time of receiving a signal or very soon thereafter for any cause, as for instance when a train is passing over or in case the bridge should be so disabled that it cannot be opened at all, the tender will answer the vessel with five short blasts given in quick succession, as a signal to check down and stop. As soon as the bridge is ready to open, he will give the return signal stated in subdivision (ii) of this subparagraph.

(iv) In case the Duluth Ship Canal bridge is disabled, the bridge authorities must give incoming and outgoing vessels timely and dependable notice, by tug service if necessary, so that they will not attempt to enter the canal. At all other times the bridge tender must lift the bridge promptly on receiving signals to do so. In case of a sudden breakdown during the lifting operation, five short blasts shall be given as a danger signal.

(v) Vessels must be given precedence over highway or railway traffic. When a signal is given by a vessel to open the bridge, a railroad train or any vehicle that may be approaching to cross the bridge must be required to wait for the vessel to pass: *Provided, however,* That except at the Duluth Ship Canal bridge, vessels of 100 gross tons or under may be held for a short period in case a first-class passenger train carrying United States mails is ready to cross the bridge.

§ 117.641 Great Lakes tributaries; bridges where constant attendance of draw tenders is not required.

(a) The owners of or agencies controlling certain bridges will not be required to keep draw tenders in constant attendance. The bridges to which this section applies are listed, and the special regulations applicable in each case are set forth in paragraph (f) of this section.

(b) Whenever a vessel, unable to pass under a closed bridge, desires to pass through the draw, advance notice, as specified, of the time when the opening is required shall be given by telephone or other means to the authorized representative of the owner of or agency controlling the bridge.

(c) Upon receipt of such notice, the authorized representative of the owner of or agency controlling the bridge, in compliance therewith, shall arrange for the prompt opening of the draw at the time specified in the notice for the passage of the vessel.

(d) The owners of or agencies controlling the bridges shall, if no draw tender is in attendance, keep conspicuously posted on both the upstream and downstream sides of the bridges, in a manner that it can be easily read at any time, a copy of the regulations in this section together

*[Interstate (Duluth-Superior) Bridge; Removed in 1974.]

with a notice stating exactly how the representative specified in paragraph (b) of this section may be reached.

(e) The operating machinery of the draws shall be maintained in a serviceable condition and the draw opened and closed at least once about the midpoint of the period specified in paragraph (f) of this section for each bridge to assure that the machinery is in proper order for satisfactory operation: *Provided*, That the operation of a drawspan for the passage of a vessel shall be deemed to constitute such test operation.

(f) The bridges to which this section applies, and the special regulations applicable in each case, are as follows:

(1) Duluth-Superior Harbor, Minn. and Wis.; all drawbridges. During the winter months from January 1 to March 15, at least 24 hours' advance notice required except for the Duluth and Superior Bridge Company Interstate Railroad* and Highway Toll Swing Bridge. The Duluth and Superior Bridge Company Interstate Railroad and Highway Toll Bridge will remain in an open position at all times, except for the passage of trains. When this bridge is locked in a open position, a continuous amber light will be visible.

(1-a) Duluth Missabe and Iron Range Railway bridge (Transfer Bridge). The draw of the bridge need not be opened for the passage of vessels, and paragraphs (a) through (e) of this section shall not apply to this bridge. The draw span shall be restored to an operating condition by and at the expense of the owner should changes in navigation on the river so require.

(2) Ontonagon Harbor, Mich.: Michigan State Highway Department bridge at Ontonagon. From March 16 through December 15 from 7 a.m. to 11 p.m. the draw shall open on signal and from 11 p.m. to 7 a.m. the draw shall open on signal if at least 1 hour's notice has been given. From December 16 through March 15 the draw shall open on signal if at least 24 hours' notice has been given. The opening signal is one long blast followed by one short blast.

(2-a) St. Joseph Harbor, Mich.; The Michigan State Highway Department Main Street (Blossomland) Bridge, Mi. 0.90, at St. Joseph. From 15 December to 1 March, at least 12 hours' advance notice required.

(3) [Revoked]

(4) [Revoked]

(4-a) Manistee River at Manistee, Mich.; All drawbridges across Manistee River from its mouth at Lake Michigan upstream to Manistee Lake. During the winter months from January 1 to April 1, at least 24 hours' advance notice required.

(5) [Revoked]

(5-a) Detroit River (Trenton Channel), Mich.; The Wayne County highway bridge between Trenton and Grosse Ile. During the winter months from December 15 to March 15, at least 5 hours' advance notice required.

(6) Calumet River, Chicago, Ill.: The New York Central Railroad Company bridges, Mile 1.34, and the Pennsylvania Railroad Company bridges, Mile 1.36. During the winter months from December 15 to March 15, at least 2 hours' advance notice required on Saturday and Sunday and from 3:00 p.m. to 7:00 a.m. Monday through Friday.

*Bridge removed in 1974.

§ 117.641a Waterways located in the Ninth Coast Guard District; seasonal operation of drawbridges.

(a) Drawtenders need not be in constant attendance at drawbridges across streams or waterways located within the boundaries of the Ninth Coast Guard District during the winter season when general navigation is curtailed.

(b) Any bridge where a drawtender is not in constant attendance for the reason stated in paragraph (a) of this section, shall be opened on 12 hours advance notice.

(c) The bridges affected and the periods of time when this section is to be in effect shall be determined by the Commander, Ninth Coast Guard District and shall be published in Notice to Mariners and other appropriate media.

§ 117.642 Keweenaw Waterway, Mich.; Michigan State Highway Department bridge between Houghton and Hancock.

(a) The owner of or agency controlling this bridge shall provide the appliances and personnel necessary for the safe, prompt, and efficient operation of the draw. The bridge shall be provided with a whistle or siren capable of being heard distinctly three-fourths mile away in any condition of weather, and an electric light signal, on the top of and near the center of the swing span, which will give flashes of the same duration and at the same time as the audible signals.

(b) Vessels approaching the bridge shall reduce their speed sufficiently to enable them to come to a stop before arrival at the bridge should the draw fail to open.

(c) The call signal for opening of the draw shall be one long and two short blasts. If the draw can be opened promptly the bridge tender shall reply by repeating the call signal. If the draw cannot be opened promptly, or if it is open and must be closed immediately, the bridge tender shall reply by sounding five short and rapid blasts, to be repeated at regular intervals until acknowledged by the vessel. The vessel shall acknowledge by sounding five short and rapid blasts. Thereafter, as soon as the draw can be opened, the draw tender shall repeat the call signal.

(d) The draw shall be opened promptly on signal for the passage of vessels of 30 net registered tons and upward except as provided in paragraph (f) of this section. The draw shall be opened as soon as convenient for the passage of vessels of less than 30 tons, but no such vessel shall be delayed for more than 10 minutes except as provided in paragraph (f) of this section.

(e) The owner of or agency controlling the drawbridge will not be required to keep a draw tender in constant attendance during the winter months from January 1 to March 15.

(f) Whenever a vessel, unable to pass under the closed bridge, desires to pass through the draw during the winter months from January 1 to March 15, at least 24 hours' advance notice of the time when the opening is required shall be given by telephone or other means to the author-

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ized representative of the owner of or agency controlling the bridge.

(g) Upon receipt of such notice, the authorized representative of the owner of or agency controlling the bridge, in compliance therewith, shall arrange for the prompt opening of the draw at the time specified in the notice for the passage of the vessel.

(h) The owner of or agency controlling the bridge shall, if no draw tender is in attendance as above provided, keep conspicuously posted on both the upstream and downstream sides of the bridge, in a manner that it can be easily read at any time, a copy of the regulations of this section together with a notice stating exactly how the representative specified in paragraph (f) of this section may be reached.

(i) The operating machinery of the draw shall be maintained in a serviceable condition and the draw opened and closed at least once on or about March 15 to assure that the machinery is in proper order for satisfactory operation: Provided, that the operation of the draw-span for the passage of a vessel shall be deemed to constitute such test operation.

§ 117.643 Fox River and Portage Canal, Wis.

(a) *Main Street, Walnut Street, and Mason Street bridges, Fox River, Green Bay.* The draws shall open on signal except that Monday through Saturday, except legal holidays, from 7 a.m. to 8 a.m. from 12 noon to 1 p.m., and from 4 p.m. to 5 p.m., the draws need not open. However, the draws shall open immediately, at any time, for public vessels of the United States, vessels with a cargo capacity of 300 short tons or over engaged in commercial transportation, and tugs or fireboats responding to emergency calls.

(b) *Bridge (highway) at De Pere, Wis.* (1) The owner of or agency controlling the bridge will not be required to keep draw tenders in constant attendance or maintain a signal device at this bridge.

(2) For the purpose of this paragraph the bridge tender and the acting clerk of the City of De Pere, Wisconsin, are designated as authorized representatives of the owner.

(3) The draw shall open promptly on signal from 8 a.m. to 6 p.m. during the regular navigation season upon three blasts of a whistle or horn. If the draw cannot be opened promptly a red flag or ball by day, or a red light at night shall be conspicuously displayed.

(4) At all other times during the regular navigation season, whenever a vessel unable to pass under the closed bridge desires to pass through the draw, at least 2 hours' advance notice of the time the opening is required shall be given to the authorized representative of the owner of or agency controlling the bridge. Upon receipt of such advance notice, the representative shall arrange for the prompt opening of the draw at the time specified in the notice for the passage of the vessel.

(5) The owner of or agency controlling such bridge shall provide arrangements whereby the representative specified in subparagraph (2) of this paragraph can be reached readily by telephone or otherwise at any time, and shall keep conspicuously posted on both the upstream and downstream sides of the bridge, in such a manner that it can be read easily at any time, a copy of these regulations together with a notice stating exactly how he may be reached.

(c) *Bridges at or between Berlin and Portage, Wis.* (1) The owners of or agencies controlling the bridges will not be required to open the draw span for the passage of vessels.

(2) The owners of or agencies controlling the bridges shall keep a legible copy of this section posted conspicuously on both the upstream and downstream sides of the bridges.

§ 117.644 East River, Wis.; Monroe Street bridge, Green Bay, Wis.

(a) The draw need not be opened for the passage of vessels.

(b) The owners of or agency controlling the bridge shall keep a legible copy of this section conspicuously posted on the downstream side of the bridge.

§ 117.644a Ogden-First Street Bridge, Menominee River, Wisconsin.

(a) The draw shall open on signal:

(1) From May 1 through October 31 from 7 a.m. to 11 p.m.

(2) From May 1 through October 31 from 11 p.m. to 7 a.m., if at least 2 hours notice is given.

(3) From November 1 through April 30 if at least 12 hours notice is given.

(b) Signals:

(1) The opening signal is one long blast followed by one short blast.

(2) The acknowledging signal is:

(i) One long blast followed by one short blast when the draw will open immediately.

(ii) Five short blasts when the draw cannot open immediately. When the draw will open the drawtender shall sound one long blast followed by one short blast.

(c) The draw need not open for the passage of vessels carrying appurtenances unessential to navigation which extend above the normal superstructure. Upon request, the District Commander will cause an inspection to be made of the superstructure and appurtenances of any vessel habitually frequenting this waterway.

(d) The owner of or agency controlling this bridge shall conspicuously post the provisions of this regulation both upstream and downstream in such a manner that it may be easily read at any time from an approaching vessel. The posted provisions shall state exactly how the authorized representative may be reached at any time.

§ 117.645 Sturgeon Bay, Wisconsin; bridges.

(a) The owners of or agencies controlling the highway drawbridge over Sturgeon Bay shall provide the necessary tenders and the proper mechanical appliances for the safe, efficient openings of the draw.

(b) Signals: (1) The opening signal shall be one long blast followed by one short blast of a whistle, horn, siren or by shouting.

(2) Acknowledging Signals: (i) When the draw will open, same as opening signal.

(ii) When the draw will not open or is open and must be closed—four short blasts, repeated at regular intervals until acknowledged by the vessel. As soon as the draw can open, the drawtender shall sound the opening signal.

(c) Draw Operation Requirements: (1) The draw of the railroad bridge shall be maintained in the fully open position.

(2) The draw of the highway bridge shall open as follows:

(i) From March 15 through May 14 and from September 16 through December 31—on signal.

(ii) From May 15 through September 15, from 6:00 p.m. to 6:30 a.m.—on signal.

(iii) From May 15 through September 15, from 6:30 a.m. to 6:00 p.m.—on the hour and half-hour provided vessels are waiting to pass. However, public vessels of the United States and commercial vessels shall be passed through the draw on signal during this period.

(iv) From January 1 through March 14—on signal if at least 12 hours notice is given.

(d) Clearance gauges, of a type approved by the Commandant, shall be installed on the upstream and downstream sides of the drawbridge by and at the expense of the owner of or agency controlling the bridge and such gauges shall be kept in good repair and legible condition.

§ 117.650 Manitowoc River, Wis.; bridges.

(a) *Bridges at Eighth and Tenth Streets, Manitowoc, Wis.* (1) The draws of the above-named bridges shall be immediately opened for the passage of vessels at all times during the day or night except between the hours of 6:50 a.m., and 7:00 a.m., 7:50 a.m. and 8:00 a.m., 11:55 a.m. and 12:10 p.m., and 12:45 p.m. and 1:00 p.m., upon a signal of three short blasts of the vessel's signaling device for the Eighth Street bridge, and upon a signal of two short and one long blasts, similarly given for the Tenth Street bridge: *Provided*, That the exception as to hours stated in this subparagraph shall not apply on Saturdays, Sundays, and legal holidays, consisting of New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day, or on the Monday following such holidays when they occur on a Sunday.

(2) In case street traffic shall have been delayed by reason of the draws of either of the above-named bridges having been continuously open for 10 minutes or more for the passage of vessels, the draws of said bridges may be closed, but shall be again opened for the passage of any vessel as soon as practicable: *Provided*, That in such case the opening of either of the above-named bridges for the passage of any vessel shall not be delayed more than 5 minutes after the proper signal is given.

(3) When signal is given by a car ferry or other large vessel to pass either of the two bridges, the remaining bridge shall also be promptly opened so that such vessel shall not be held between the two bridges.

(4) In case either draw cannot be immediately opened when the signals are given, a red flag or ball by day or a red light at night shall be conspicuously displayed on the bridge in full view of the vessel.

(b) *Minneapolis, St. Paul, and Sault Ste. Marie Railway Co. bridge at Manitowoc, Wis.* (1) The owners or operators of the drawbridge shall provide the same with the necessary tender and the proper mechanical appliances for the safe, prompt, and efficient opening of the draw for the passage of vessels.

(2) The draw of the bridge shall be immediately opened on proper signal for the passage of approaching vessels.

(3) The signal for the opening of the draw, upon the approach of a vessel from either direction, shall be two short and one long blasts of the vessel's signaling device sounded within reasonable hearing distance of the bridge.

(4) The signal from the bridge to indicate that the vessel's signal has been received, but not to indicate passage, shall be three loud and distinct strokes of a bell or three distant blasts of a whistle.

(5) If for any reason the draw cannot be operated, two red lights mounted 30 inches between centers, horizontally, in an elevated position above the bridge and showing both upstream and downstream, shall be flashed alternately, or if the lights cannot be flashed, a conspicuous red flag by day and a red light by night shall be waved from the bridge upon receipt of the signal from the vessel so that it can be seen clearly by the master of the vessel.

(6) A red ball by day and a red light by night shall be kept in a conspicuous elevated position above the top of the control house while the bridge is closed and each shall be lowered into a box out of sight from all directions when the opening of the bridge is begun.

§ 117.652 Sheboygan River, Wis.; Eighth Street Bridge at Sheboygan, Wis.

(a) From May 1 through October 30 from 6 a.m. to 10 p.m. the draws shall open on signal.

(b) The draws shall open on signal at all other times of the year if at least 2 hours' notice has been given.

(c) Signals.

(1) The opening signal is one long blast followed by one short blast.

(2) The acknowledging signal when the draw will open is one long blast followed by one short blast.

(3) The acknowledging signal when the draw will not open or is open and must close is four blasts. When the draw can open, the signal is one long blast followed by one short blast.

(4) The signals may be made by a whistle, horn, or bell, or by shouting.

(d) The owner of or agency controlling the bridge shall conspicuously post notices containing the substance of these regulations, both upstream and downstream, on

the bridge or elsewhere, in such a manner that they can be easily read at all times from an approaching vessel.

§ 117.655 Milwaukee, Menomonee, and Kinnickinnic Rivers, and South Menomonee Canal, Milwaukee, Wis.; bridges.

(a) *Regulations for all bridges owned or operated by the City of Milwaukee across the Milwaukee, Menomonee, and Kinnickinnic Rivers, including the South Menomonee Canal, except bridges across the Milwaukee River north of and including Buffalo Street Bridge.* (1) The draws of the above-named bridges shall be immediately opened for the passage of foreign vessels and "vessels of the United States" as defined by section 4311 of the Revised Statutes (46 U.S.C. 251), at all times during the day or night except between the hours of 7:30 a.m. and 8:30 a.m., and 4:30 p.m. and 5:30 p.m., upon signals to be given by blasts of a horn, steam whistle, or other approved signaling devices, as follows, viz.: For the North Plankinton Avenue bridge across the Menomonee River and the Kinnickinnic Ave. bridge across the Kinnickinnic River, four short blasts; for all other bridges specified in this subparagraph, three short blasts: *Provided*, That the exception as to hours stated in this subparagraph shall not apply to vessels having a license to carry 50 or more passengers when proceeding to or from their regular landing places on their regular trips, nor to vessels carrying United States mails, nor to vessels belonging to the United States, nor to fireboats of the City of Milwaukee; *And provided, further*, That the exception as to hours stated in this subparagraph shall not apply on Sundays and legal holidays, consisting of New Year's Day, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, and Christmas Day, or on the Monday following such holidays when they occur on a Sunday.

(2) In case street traffic shall have been delayed by reason of the draws of any of the above-described bridges having been continuously open for 5 minutes or more for the passage of any of the vessels before described, the draws of said bridges may be closed but shall be again opened for the passage of said vessels as soon as practicable: *Provided*, That in such case the opening of any of the above-described bridges for the passage of any vessels before described shall not be delayed more than 5 minutes after the proper signal is given, except during the hours stated in subparagraph (1) of this paragraph.

(3) The draws shall, when the above described signals are given, except between the hours of 7:30 a.m. and 8:30 a.m., and 4:30 p.m. and 5:30 p.m., be opened as soon as practicable for all other vessels which cannot pass the closed bridges: *Provided, however*, That no vessel of this class shall be delayed for a longer period than 15 minutes, except during the hours stated herein.

(4) In case the draws cannot be immediately opened when the signals are given a red flag or ball by day, or a red light at night shall be conspicuously displayed.

(5) Pedestrians and vehicles shall not stop on a bridge for the purpose of delaying its opening, nor shall watercraft be handled so as to hinder or delay the operation of the draw, but all passage over or through a bridge shall be prompt to prevent delay to either land or water traffic.

(b) *Regulations for all bridges owned and operated by the City of Milwaukee across the Milwaukee River north of and including the Buffalo Street Bridge.* (1) The draws of the above-named bridges shall be immediately opened for the passage of foreign vessels and "vessels of the United States" as defined by section 4311 of the Revised Statutes (46 U.S.C. 251), at all times during the day or night except between the hours of 7:30 a.m. and 8:30 a.m., and 4:30 p.m. and 5:30 p.m., only upon advance notice given by telephone or otherwise to the Superintendent of the Bureau of Bridges, City Hall, Milwaukee, Wisconsin, at least 2 hours in advance of the time the vessel desires to pass through the draw upon signals to be given by three short blasts of a horn, steam whistle, or other approved signaling device: *Provided*, That the exception as to hours and advance notice stated in this subparagraph shall not apply to fireboats of the City of Milwaukee, nor to vessels belonging to the United States.

(2) In case street traffic shall have been delayed by reason of the draws of any of the above-described bridges having been continuously open for 5 minutes or more for the passage of any of the vessels before described, the draws of said bridges may be closed, but shall be again opened for the passage of said vessels as soon as practicable: *Provided*, That in such case the opening of any of the above-described bridges for the said vessels shall not be delayed more than 5 minutes after the proper signal is given, except during the hours stated under subparagraph (1) of this paragraph.

(3) The draws shall, when the above-described signals are given, except between the hours of 7:30 a.m. and 8:30 a.m., and 4:30 p.m. and 5:30 p.m., be opened as soon as practicable for all other vessels which cannot pass the closed bridges: *Provided, however*, That no vessel of this class shall be delayed for a longer period than 15 minutes, except during the hours stated herein.

(4) A copy of the regulations contained in this section shall be conspicuously posted on both the upstream and downstream sides of each bridge in such manner that it can be easily read at any time; also a sign shall be placed on the downstream side of the Buffalo Street Bridge and the upstream side of the Walnut Street Bridge on the Milwaukee River stating the hours during which advance notice is required and the amount of such notice and also stating exactly how the Superintendent of the Bureau of Bridges specified in subparagraph (1) of this paragraph may be reached to give the required advance notice.

(c) *Regulations for all bridges owned and operated by the Chicago and North Western Railway Co., and the Chicago, Milwaukee, St. Paul and Pacific Railroad Co., across the Milwaukee, Menomonee, and Kinnickinnic Rivers within the limits of the City of Milwaukee.* (1) The draws of the above-named bridges shall be immediately opened for the passage of foreign vessels and "vessels of the United States" as defined by section 4311 of the Revised Statutes (46 U.S.C. 251), at all times during the day or night, upon signals to be given by blast of a horn, steam whistle, or other approved signaling device,

as follows, viz: For the Chicago, Milwaukee, St. Paul and Pacific Railroad bridge across the Menomonee River at North Plankinton Avenue, and the Chicago and North Western Railway bridge across the Kinnickinnic River between Kinnickinnic Avenue and South First Street, four short blasts; for all other of above-described bridges, three short blasts, except when a passenger or mail train is actually ready to pass over the bridge, but in no case shall the opening of any of the above-described bridges for the vessels above-described be delayed more than 7 minutes after the signal is given and except as provided in subparagraph (4) of this paragraph.

(2) When the above signals are given, the draws of each bridge shall open as soon as practical for all other vessels which cannot pass the closed draw, however no vessel shall be delayed for more than 15 minutes except as provided in subparagraph (4) of this paragraph.

(3) In case the draws cannot be immediately opened when the signals are given, a red flag or ball by day or a red light at night shall be conspicuously displayed.

(4) Advance notice as specified in subparagraph (5) of this paragraph will be required for opening the following bridges:

(i) Kinnickinnic River; Chicago and North Western Railway Co. bridge, Mile 1.52.

(ii) Kinnickinnic River; Chicago, Milwaukee, St. Paul and Pacific Railroad Co. bridge, Mile 1.49.

(iii) Burnham Canal; Chicago, Milwaukee, St. Paul and Pacific Railroad Co. bridge, Mile 0.76.

(5) Whenever a vessel, except the City of Milwaukee fireboat, unable to pass under the bridges listed in subparagraph (4) of this paragraph, desires passage, 2 hours' advance notice of the time opening is required shall be given to the Chicago and North Western Train Dispatcher, Milwaukee, Wisconsin, Telephone Broadway 6-6540, Extension 35, or to the Chicago, Milwaukee, St. Paul and Pacific Railroad Co. phone director, Telephone Broadway 1-6120, Extension 359, Milwaukee, Wisconsin. The draws shall, when the signals described in subparagraph (1) of this paragraph are given, be opened as soon as practicable for the City of Milwaukee fireboat.

(6) The owners of the bridges listed in subparagraph (4) of this paragraph shall keep conspicuously posted on both the upstream and downstream sides thereof, in such a manner that it can be easily read at any time, a copy of the regulations of this section pertaining to the respective bridges together with information as to whom notice is to be given when opening is required.

§ 117.660 Root River, Racine, Wisconsin, Main Street and State Street bridges.

(a) The draws of these bridges shall open on signal except that

(1) The draw of the Main Street bridge may remain closed to the passage of vessels, Monday through Friday, except holidays, during the following periods: 7:30 a.m. to 8:10 a.m.; 11:50 a.m. to 12:10 p.m.; 12:50 p.m. to 1:10 p.m.; 3:30 p.m. to 4:10 p.m.; 4:30 p.m. to 5:10 p.m.

(2) The draw of the State Street bridge may remain closed to the passage of vessels, Monday through Friday, except holidays, during the following periods: 6:30 a.m. to 7 a.m.; 12 noon to 12:15 p.m.; 12:45 p.m. to 1 p.m.

(b) Signals:

(1) Main Street bridge—The opening signal is one long blast followed by one short blast of a whistle, horn, siren, or by shouting.

(2) State Street bridge—The opening signal is three short blasts of a whistle, horn, siren, or by shouting.

(3) The acknowledging signal from the drawtender when the draw will open promptly is the same as the opening signal or a white flag or ball by day and a white light by night, conspicuously displayed. The acknowledging signal from the drawtender when the draw cannot open promptly or is open and must close is four or more short blasts, or a red flag by day or a red light at night, conspicuously displayed.

(c) The owners of or agencies controlling these bridges shall provide the necessary drawtenders and the proper mechanical appliances for the safe, prompt and efficient opening of the draw.

(d) The draws shall open on signal at all times for vessels in distress and public vessels of the United States, state or local governments engaged in public safety or law enforcement activities.

(e) The owners of or agencies controlling these bridges shall post the provisions of this regulation on the upstream and downstream sides of the bridges or elsewhere in a manner that it can easily be read from an approaching vessel at all times.

§ 117.663 The Chicago River and its tributaries.

(a) The draws of each of the bridges in this section shall open promptly on signal except as provided in paragraph (e) of this section.

(b) The owners of or agencies controlling each bridge shall provide the necessary drawtenders and the proper operating machinery, maintained in serviceable condition, for the safe opening of the draw.

(c) The owners or agencies controlling each bridge shall conspicuously post and maintain notices both upstream and downstream of each bridge in such a manner that they can easily be read from an approaching vessel. The notices shall contain the special operational regulations applicable to each bridge. When applicable, information as to whom notice should be given when passage through the draw is desired and how such persons may be reached shall be included.

(d) Signals. (1) Call signals for opening of drawbridges or passing through an open draw shall be three short blasts of a whistle, horn, or siren, or by shouting for all bridges except the Chicago and Northwestern Railroad bridge near West Kinzie Street and the Chicago, Milwaukee, St. Paul and the Pacific Railroad bridge near West North Avenue for which the signal shall be four short blasts, and the Lake Street bridge when approaching from the north for which the signal shall be five short blasts.

(2) Acknowledging signals to be given by drawtender:

(i) When the draw will be opened immediately. None.

(ii) When the draw cannot open immediately or is open and must be closed immediately. A red flag by day

or a red light by night waved until the draw can be opened.

(3) When two or more vessels are approaching a drawbridge at the same time from opposite directions with the draw open or closed, each vessel shall signal independently for the opening of the draw, and the drawtender shall reply to the signal of each vessel if the draw cannot open or is open and must be closed.

(e) Bridges not opening promptly on signal.

(1) Monday through Friday, from 7:30 a.m. to 10 a.m. and 4 p.m. to 6:30 p.m., the draws of the bridges across the Chicago River, South Branch from its junction with the Chicago River south to and including West Roosevelt Road and North Branch at West Kinzie Street and at the Northwest Expressway Feeder bridge need not open for the passage of vessels.

(2) Monday through Friday, from 7 a.m. to 8 a.m. and 5 p.m. to 6 p.m., the draws of the bridges across the North Branch of the Chicago River at Grand Avenue and all bridges north of the Northwest Expressway Feeder bridge to and including North Halsted Street and across the South Branch of the Chicago River south of West Roosevelt Road to and including South Halsted Street need not open for the passage of vessels.

(3) Monday through Friday, from 7 a.m. to 8 a.m. and 5:30 p.m. to 6:30 p.m., the draws of the bridges across the North Branch of the Chicago River north of North Halsted Street and the South Branch of the Chicago River south of South Halsted Street need not open for the passage of vessels.

(4) From January 1 through March 31, the highway bridges across the Chicago River, the North Branch of the Chicago River, North Branch Canal and the South Branch of the Chicago River shall open on signal if at least 12 hours' notice is given. However, the Randolph Street, Cermak Road, Throop Street, and Loomis Street bridges across the South Branch of the Chicago River, the North Halsted Street bridge across the North Branch Canal, and the West Kinzie Street bridge across the North Branch of the Chicago River shall open on signal at all times other than those times provided in paragraphs (e) (1), (2) and (3) of this section.

(5) Constant attendance is not required at the following City of Chicago bridges:

(i) Chicago River, South Branch
Washington Street
Madison Street
Monroe Street
Adams Street
Jackson Boulevard
Van Buren Street
Congress Street (Eisenhower Expressway)
Harrison Street
Roosevelt Road
Eighteenth Street
Canal Street
South Halsted Street

(ii) West Fork of the South Branch
South Ashland Avenue
South Damen Avenue

(iii) Chicago River, North Branch
Grand Avenue
Chicago Avenue
North Halsted Street
Ogden Avenue
Division Street

(iv) North Branch Canal
Ogden Avenue
Division Street

Roving drawtenders shall open these bridges not more than 30 minutes after notification to the Port Director's Office or an authorized representative.

(6) (Reserved)

(7) The draw of the Chicago, Milwaukee, St. Paul & Pacific Railroad bridge need not open for the passage of vessels. However, the draw shall be returned to an operable condition within six months after notification from the Commandant, U.S. Coast Guard, to take such action.

(8) The draws of bridges that have a vertical clearance of less than 17 feet above Low Water Datum for Lake Michigan shall open at any time to permit the passage of tugs and tugboats.

(f) The draws of any of the bridges listed in this section shall be opened as soon as possible for the passage of emergency vessels of the City of Chicago or public vessels of the United States notwithstanding any exceptions set forth elsewhere in this section.

(g) The draw of the Lake Shore Drive bridge across Ogden Slip need not open for the passage of vessels. The operating machinery need not be maintained.

(h) The draws of the North Avenue, Cortland Street, Webster Avenue, North Ashland Avenue, Chicago and Northwestern Railroad, North Damen Avenue, and Belmont Avenue bridges across the North Branch of the Chicago River need not open for the passage of vessels. However, the draws shall be returned to an operable condition within 6 months after notification from the Commandant to take such action.

§ 117.670 Calumet River, Ill. and Ind.; bridges.

(a) The owners of or agencies controlling drawbridges across the Calumet River between Lake Michigan and the north side of 130th Street, Chicago, Illinois, shall provide the appliances and the personnel necessary for the prompt, safe and efficient operation of the draws for the passage of vessels.

(b) The drawbridges shall be opened promptly when the signal hereinafter prescribed is received from an approaching vessel or other watercraft which cannot pass under the closed draws excepting in the case of a railroad bridge, when an approaching train is so close that it cannot be stopped safely before reaching the bridge.

(c) Trains shall not, except in emergencies or under compelling circumstances, be stopped on, nor shall switching be permitted on, a drawbridge or within a bridge block home signal limits, nor shall any vehicle, person or persons assemble, walk, stand, or otherwise interfere with the operation of the draw or be authorized to do so, so as to prevent or delay a required opening, nor shall water craft be navigated so as to hinder or delay the operation of or passage of other vessels through the draw, but all

passage over or through a drawbridge shall be prompt in order to prevent delay to either land or water traffic.

(d) Signals:

(1) *Call signals for opening of drawbridge or passing through an open draw*—(i) *Sound signals.* Three short blasts of a whistle, horn or siren, sounded within reasonable hearing distance of the bridge, repeated if necessary, and in time to give due notice to the draw tender.

or

(ii) *Visual signals.* A white flag by day or a white light by night, swung in vertical circles at arm's length in full sight of the bridge and facing the draw. This signal shall be used in conjunction with sound signals when conditions are such that sound signals may not be heard and at other times if considered desirable.

(2) *Acknowledging signals to be given by operator of the drawbridge*—(i) *Sound signals.* None required.

(ii) *Visual signals*—(*a*) *When draw cannot be opened promptly or when draw is opened and is to be closed for any reason.* (*1*) Two red lights (see Note 1 at the end of this section) flashed alternately; or

(*2*) A red flag by day or a red light by night, swung in vertical circles at arm's length in full sight of the vessel.

(*b*) *When draw can be opened promptly.* (*1*) Two amber lights (see Note 1 at the end of this section) flashed alternately; or

(*2*) A white flag by day or a white light by night, swung in vertical circles at arm's length in full sight of the vessel.

(*c*) *When draw is open for passage.* (*1*) Two green lights (see Note 1 at the end of this section) flashed alternately; or

(*2*) A green flag by day or a green light by night, swung in vertical circles at arm's length in full sight of the vessel.

(e) No vessel shall attempt to navigate the draw of a bridge until the green light or green flag signals prescribed in paragraph (d) (2) (ii) (*c*) of this section are displayed.

(f) When vessels are approaching a bridge from the same direction, each vessel shall give the call signal for opening of the draw.

(g) Special provisions for opening the five railroad bridges located at Mile 1.31 to 1.36 from the east end of the North Pier: Upon receipt of a call signal for opening of the draws, all bridges which do not have a train in the bridge block home signal limits shall be raised immediately. However, this provision will not apply if it is known that one of the bridges is inoperable because of equipment breakdown.

NOTE 1: The two red, amber and green light units will be arranged in horizontal planes approximately 48" apart; flashed for about 2 seconds duration; provided with candlepower sufficient to be readily visible at least ½ mile; placed on the upstream and downstream sides of each bridge, except at the five railroad bridges, where one unit will be placed on the upstream (lakeward) side of the B. & O. Railroad Bridge and the other on the downstream side of the southernmost Pennsylvania Railroad* Bridge; and located so as to be readily visible to approaching navigation as will be determined by the District Commander.

NOTE 2: The above signals are in addition to the bridge lights required by law to be displayed on all bridges across navigable waters of the United States.

§ 117.676 Indiana Harbor Canal, Ind.; drawbridges.

(a) The owners of or agencies controlling drawbridges across Indiana Harbor Canal and the Lake George Branch of Indiana Harbor Canal to and including the Indianapolis Boulevard bridge, shall provide the appliances and the personnel necessary for the prompt, safe, and efficient operation of the draws for the passage of vessels.

(b) The draw shall be opened promptly when the signal hereinafter prescribed for the opening of the draw is received from an approaching vessel or other watercraft which cannot pass under the closed draw, excepting when an approaching train is so close to a drawbridge that it cannot be stopped safely before reaching the bridge.

(c) Trains and vehicles shall not be stopped on a drawbridge or within a bridge block interlocking system, nor shall any person or persons assemble, walk, stand, or otherwise interfere with the operation of the draw or be permitted to do so, so as to prevent or delay a required opening, nor shall water craft be navigated so as to hinder or delay the operation of or passage of other vessels through the draw, but all passage over or through a drawbridge shall be prompt in order to prevent delay to either land or water traffic.

(d) Signals:

(1) *Call signals for opening of draw*—(i) *Sound signals.* One long blast, one short blast, and one long blast of a whistle, horn or siren, sounded within reasonable hearing distance of the bridge, repeated if necessary, and in time to give due notice to the draw tender.

(ii) *Visual signals.* A white flag by day or a white light by night, swung in vertical circles at arm's length in full sight of the bridge and facing the draw. This signal to be used in conjunction with sound signals when conditions are such that sound signals may not be heard and at other times if considered desirable.

(2) *Acknowledging signals*—(i) *Sound signals*—(*a*) *When draw can be opened immediately.* One long blast and one short blast of a whistle, horn, or siren.

(*b*) *When draw cannot be opened immediately or when it is open and must be closed immediately.* Five short blasts of a whistle, horn, or siren, repeated at regular intervals until similarly acknowledged by the vessel, or until the vessel has been brought to a stop. Thereafter, as soon as the draw can be opened, the draw tender shall sound a signal of one long blast and one short blast of a whistle, horn, or siren.

(ii) *Visual signals.* The systems of visual signals hereinafter described to be used in each individual case will be subject to the approval of the District Commander. They will be used in conjunction with sound signals when conditions are such that sound signals alone are insufficient. When the flashing red and green lights are in use and an operating failure occurs, the flag and lantern signals shall be used during the emergency.

*Merger—1 Feb. 1968; Now Penn Central.

(*a*) *When the draw can be opened immediately.* (*1*) A white flag by day or a white light by night, swung in vertical circles at arm's length in full sight of the vessel, or

(*2*) Two green lights, flashed alternately, arranged in a vertical plane approximately 48 inches between centers.

(*b*) *When the draw cannot be opened immediately, or when it is open and must be closed immediately.* (*1*) A red flag by day or a red light by night, swung in vertical circles at arm's length in full sight of the vessel, and repeated until acknowledged by a like signal from the vessel. Thereafter, as soon as the draw can be opened the draw tender shall so indicate with a white flag by day or a white light by night, swung in vertical circles at arm's length in full sight of the vessel, or

(*2*) Two red lights, flashed alternately, arranged in a horizontal plane approximately 48 inches between centers. Thereafter, as soon as the draw can be opened the draw tender shall so indicate by flashing two green lights.

(e) No vessel shall attempt to navigate the draw of a bridge when audible or visual signals indicate the bridge cannot be opened or if the draw is open it must be closed immediately.

(f) When vessels are approaching a bridge from the same direction, each vessel shall give the call signal for the opening of the draw, and such vessels shall be navigated in accordance with the applicable pilot rules.

(g) Special rules for the Elgin, Joliet and Eastern Railway Company bridge, Baltimore and Ohio Railroad Company bridge, both New York Central Railroad Company bridges, and Indiana Harbor Belt Railroad Company bridge:

(1) An amber light shall be located on the lakeward and landward bridges, and readily visible to approaching vessels, and shall be synchronized with a sound signal system so as to light as each signal blast is sounded.

(2) Upon receipt of call signal for opening of the draws, all bridges which do not have a train in the signal block shall be raised immediately.

§ 117.680 Trail Creek, Ind.; The Michigan Central Railroad Company bridge, Michigan City.

(a) The draw shall be opened promptly on signal for the passage of vessels between 6:30 a.m. and 2:30 p.m. daily, except Sundays, from February 16 to December 14, inclusive, of each year.

(b) From December 15 to February 15, inclusive, on all Sundays, and between 2:30 p.m. and 6:30 a.m. on all other days, the owner of or agency controlling the bridge need not keep a draw tender in constant attendance.

(c) Whenever a vessel, unable to pass under the closed bridge, desires to pass through the draw during one of the periods specified in paragraph (b) of this section and a draw tender is not in attendance, the Chief Dispatcher, The Michigan Central Railroad Company, Chicago, Illinois, shall be so notified by telephone (collect). The Chief Dispatcher shall then make arrangements for the draw to be opened within 20 minutes after notification or at such other time as may be specified in the notice.

(d) The owner of or agency controlling the bridge shall keep conspicuously posted on both the upstream and downstream sides thereof, in such manner that it can easily be read at any time, a copy of the regulations in this section together with a notice stating exactly how the Chief Dispatcher may be reached by telephone.

§ 117.685 Grand River and the channel at mouth of Spring Lake, Mich.; bridge.

(a) Grand Trunk Western Railroad bridge, mile 2.8.

(1) The draw shall open on signal from March 16 through December 14.

(2) The draw shall open on signal from December 15 through March 15 if at least 24 hours notice is given.

(3) The opening signal is one blast of a whistle, horn, or by shouting.

(b) U.S. Highway 31 bridge, mile 2.9.

(1) From March 16 through May 14, and from October 15 through December 14, the draw shall open on signal.

(2) From May 15 through October 14, the draw shall open on signal from 9:03 p.m. until 6:03 a.m. From 6:03 a.m. until 9:03 p.m., the draw shall open on signal from three minutes before to three minutes after the hour and half hour.

(3) From December 15 through March 15, the draw shall open on signal if at least 24 hours notice is given.

(4) Commercial vessels, public vessels of the United States, vessels in distress, and state or local government vessels used for public safety shall be passed through the draw as soon as possible at any time even though the closed periods may be in effect.

(5) The owner of or agency controlling this bridge shall keep a copy of these regulations conspicuously posted both upstream and downstream, either on the bridge or elsewhere in such a manner that it can easily be read from an approaching vessel at all times, with a notice stating exactly how notice is to be given to the authorized representative of the bridge owner to effect an opening.

(6) The opening signal for this bridge is one long blast followed by one short blast of a whistle, horn, or by shouting.

(c) Railroad drawbridge across the mouth of Spring Lake.

(1) The draws shall open on signal from March 16 through December 14. From December 15 through March 15 the draws shall open on signal if at least 24 hours notice is given.

(2) The opening signal is two blasts of a whistle, horn, or by shouting.

§ 117.690 Pine River, Charlevoix, Mich.: drawbridges.

(a) *Responsibility for operation.* The owners of or agencies controlling the drawbridges described in this section shall provide the necessary tenders and the proper mechanical appliances for the safe, efficient opening of the draws.

(b) *Delays prohibited.* Trains, vehicles, or pedestrians shall not stop or be stopped on these drawbridges for the purpose of delaying its opening, nor shall vessels be handled so as to hinder or delay the operation of the draw, but all passages over or through these drawbridges shall be prompt to prevent delay to either land or water traffic.

(c) *Signals*—(1) *Opening signal.* One long blast followed by one short blast of a whistle, horn, or megaphone.

(2) *Acknowledging signals.* (i) When the draw can be opened, same as opening signal.

(ii) When the draw cannot be opened or is open and must be closed—4 or more short blasts, repeated at regular intervals of approximately 15 seconds, until acknowledged by the same signal. As soon as the draw can be opened, the draw tender shall sound the opening signal.

(d) *Bridge Street Highway Bridge (US–31).* (1) The draw need not be opened between 6 a.m. and 6 p.m. except from 3 minutes before to 3 minutes after the hour and half hour and except for the passage of public vessels of the United States or vessels employed for police and/or fire protection or vessels in distress. Upon being opened, this bridge shall remain open long enough to allow waiting vessels to pass.

(2) Clearance gauges as prescribed by the Commandant shall be installed on both the upstream and downstream sides.

(3) The owner of or agency controlling this drawbridge shall keep conspicuously posted on both the upstream and downstream sides, in such a manner that it may be easily read at any time, a copy of the special regulations governing the operation of this bridge.

(4) The bridge will be opened at any time for vessels seeking refuge from storms.

(e) *Chesapeake and Ohio Railroad Bridge.* The draw shall be opened at any time on signal except when a train is on the bridge or is approaching so closely that it is unable to stop. The draw tender will so signal, and the vessel will acknowledge, as outlined in paragraph (c)(2)(ii) of this section.

§ 117.692 Crooked River, Mich.; Village of Alanson bridge in Alanson, Mich.

(a) The owner of or agency controlling this bridge shall provide the appliances and personnel necessary for the safe, prompt, and efficient operation of the draw during the period May 16 to October 31, inclusive, or leave the bridge in an open position when unattended.

(b) Whenever a vessel, unable to pass under the closed bridge, desires to pass through the draw during the period November 1 to May 15, inclusive, at least eight hours' advance notice of the time the opening is required shall be given to the authorized representative of the owner of or agency controlling the bridge.

(c) Upon receipt of such advance notice, the authorized representative of the owner of or agency controlling the bridge, in compliance therewith, shall arrange for the prompt opening of the draw at the time specified in the notice for the passage of the vessel.

(d) The owner of or agency controlling the bridge shall keep conspicuously posted on both the upstream and downstream sides thereof, in such manner that it can easily be read at any time, a copy of the regulations in this section together with a notice stating exactly how the representative specified in paragraph (b) of this section may be reached.

(e) Whenever a vessel, unable to pass under the closed bridge, approaches it, the signal for the draw to be opened shall be three blasts of a whistle or horn blown on the vessel. This signal shall be repeated at intervals until it is answered from the bridge. Upon receiving the signal from the vessel, the tender or operator of the bridge, in case the draw will be opened immediately, shall reply by one long blast of a whistle or horn. In case the opening of the draw will be delayed on account of accident to the machinery or other contingency, the signal from the vessel shall be answered by the tender or operator of the bridge by five short blasts of a whistle or horn, to be followed by one long blast when the draw is to be opened.

(f) The operating machinery of the draw shall be maintained in a serviceable condition, and the draw shall be opened and closed at intervals frequent enough to make certain that the machinery is in proper order for satisfactory operation.

§ 117.695 St. Marys Falls Canal, Mich.; International Bridge.

(a) The bascule and vertical lift spans of this bridge shall be maintained in the open position during the navigation season, except when a train is approaching and crossing this bridge.

(b) All vessels approaching either drawspan of the bridge when closed, and desiring passage through it, shall signal therefor by three whistle blasts.

(c) Upon receiving the opening signal, the bridge operator shall answer by giving one long and one short blast of the bridge horn, and he shall then proceed immediately to open the bridge.

(d) In case the bridge cannot be opened for any cause, the bridge operator shall answer by giving five short blasts of bridge horn; and the vessel shall then be stopped until the bridge is ready to be opened, when the bridge operator shall give one long and one short blast of the bridge horn for passage, and the vessel may proceed.

(e) Bridge operators shall not give precedence to railway traffic and shall not close the bridge against an upbound vessel after lock gates are open and vessel proceeding toward the bridge, nor against a downbound vessel, 1,200 feet or less west of the bridge, unless said vessel is moored at either canal pier awaiting its turn to take position at lock approaches.

§ 117.696 Cheboygan River, Cheboygan, Mich.; U.S. 23 bridge.

(a) The draw shall open on signal except that: (1) From May 16 through September 15, Monday through Friday, from 7:18 a.m. to 6:12 p.m., and from 11:18 a.m. to 5:12 p.m., on Saturday, the draw need open only from three minutes before to three minutes after the quarter hour and the three-quarter hour.

(2) From December 15 through March 15, the draw need open only if at least 24 hours notice is given to the City of Cheboygan Police Department.

(b) The draw shall open on signal at any time for public vessels of the United States, state or local government vessels engaged in public safety or law enforcement activities, commercial vessels, or vessels in distress. The open-

ing signal from these vessels is four blasts of a whistle or horn, or by shouting.

(c) The opening signal from all other vessels is one long blast followed by one short blast.

(d) The acknowledging signal is:

(1) When the draw shall open promptly, one long blast followed by one short blast.

(2) When the draw cannot open or is open and must be closed, four short blasts.

(e) The owner of or agency controlling this bridge shall keep a copy of the regulations in this section together with information stating how notice is to be given to the authorized representative of the bridge owner posted both upstream and downstream, either on the bridge or elsewhere in such manner that it can easily be read from an approaching vessel at all times.

§ 117.697 Thunder Bay River, Mich.; City of Alpena bridge at Second Avenue.

(a) The owner of or agency controlling the bridge will not be required to keep draw tenders in constant attendance.

(b) For openings of the draw, at least 3-hours' advance notice is required.

(c) Advance notice shall be given to the Dispatcher, Police Department, City of Alpena, Michigan, telephone (517) 354–4147. Notice shall include the name of the vessel, its location at the time notice is given, if inbound, the destination and expected time of arrival, and if outbound, the point and expected time of departure. The actual opening in each case will be accomplished only after exchange of the prescribed signals.

(d) The signal for opening the bridge shall be three distinct blasts of a whistle or horn blown on the vessel. If the draw is ready and will be opened immediately, the draw operator shall answer by three blasts of a siren on the bridge.

(e) The owner of or agency controlling the bridge shall keep a copy of this section conspicuously posted on both sides of the bridge in such manner that it can be read easily at any time.

(f) The operating machinery of the draw shall be maintained in a serviceable condition, and the draw shall be opened and closed at intervals frequent enough to make certain that the machinery is in proper order for satisfactory operation.

§ 117.700 Saginaw River, Mich.; bridges.

(a) The owner of or agencies controlling each bridge shall provide the necessary drawtenders and the proper mechanical appliances for the safe, prompt opening of the draw for the passage of vessels.

(b) From March 16 through December 15 the draw of railroad bridges shall open as soon after receiving an opening signal as possible, however, passage of a vessel shall not be delayed for more than 15 minutes.

(c) Sound signals: These signals may be made by a whistle, horn, or other sound producing device or by shouting.

(1) The opening signal from a vessel is one long blast followed by one short blast.

(2) The acknowledging signal from the drawtender when the draw shall open is one long blast followed by one short blast.

(3) The acknowledging signal from the drawtender when the draw cannot open is four short, rapid blasts.

(d) Visual signals shall be used in conjunction with sound signals when sound signals cannot be heard.

(1) The vessel shall signal for an opening of the draw with a white flag by day or a green light at night, swung in full circles at arm's length in full sight of the bridge and facing the draw.

(2) When the draw will open, the drawtender shall acknowledge with a white flag by day or a green light at night, swung up and down vertically.

(3) When the draw cannot open, the drawtender shall acknowledge with a red flag by day or a red light at night, swung to and fro horizontally in full sight of the vessel until answered from the vessel by the same signal. In lieu of this procedure the drawtender may have two red lights mounted 30 inches between centers, horizontally, in an elevated position above the bridge and visible both upstream and downstream which will flash alternately when the draw cannot open.

(e) Public vessels of the United States, vessels in distress, and state or local government vessels used for public safety shall be passed through the draw of these bridges as soon as possible at any time, even though closed periods be in effect. Four short blasts is the opening signal from these vessels.

(f) Trains and vehicles shall not be stopped on a bridge for the purpose of delaying its opening, nor shall vessels be handled so as to hinder or delay the operation of the draw. All passages across or through a bridge shall be prompt to prevent unnecessary delay to either land or water traffic.

(g) The draw need not open to provide additional clearance for appurtenances unessential for navigation of the vessel, or for appurtenances essential for navigation but which may be altered by hinging, telescoping, collapsing, or otherwise, so as to require no greater clearance than the highest fixed and essentially unalterable point of the vessel.

(h) Bay City highway and railroad bridges:

(1) From December 16 through March 15 the draws of the highway bridges shall open on signal if at least 12 hours' notice has been given to the dispatcher*, police department, Bay City.

(2) From March 16 through December 15 the draws of the Belinda Street, Third Street, Veterans Memorial and Lafayette Street Bridges shall open on signal, except that:

(i) From 6:30 a.m. to 8:30 a.m. and 3:30 p.m. to 5:30 p.m., Monday through Friday, except legal holidays observed in the locality, the draws need not open for the passage of vessels of less than 50 gross tons.

(ii) From 7:30 a.m. to 8:30 a.m. and 4:30 p.m. to 5:30 p.m., Monday through Friday, except legal holidays observed in the locality, the draws need not open for passage of downbound vessels of over 50 gross tons.

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*517/895-5521 (1974)

(iii) From 8 a.m. to 8 p.m. on Saturdays, Sundays, and legal holidays observed in the locality, the draws of the Lafayette Street and Belinda Street Bridges need not open for the passage of recreational vessels except for 3 minutes before to 3 minutes after the hour and half-hour.

(iv) From 8 a.m. to 8 p.m. on Saturdays, Sundays, and legal holidays observed in the locality, the draw of the Veteran's Memorial Bridge need not open for the passage of recreational vessels except for 3 minutes before to 3 minutes after the quarter hour and the three-quarter hour.

(3) The draws of the Detroit and Mackinac, and the Penn Central Railroad bridges shall open on signal from March 16 through December 15.

(i) The draws shall open on signal from December 16 through March 15 if at least 12 hours' notice has been given.

(i) I-75 highway bridge at Zilwaukee;

(1) The draw shall open on signal from December 16 through March 15 if at least 12 hours notice has been given.

(2) The draw shall open on signal from March 16 through December 15. However, vessels should schedule passages through the draw during other than peak vehicular traffic periods as determined by the Michigan State Highway Department.

(j) Bridges at Saginaw;

(1) Sixth Avenue: The draw shall open on signal from 7 a.m. to 11 p.m. from April 1 through November 15. At all other times the draw shall open on signal if at least 3 hours notice has been given.

(2) The draws of all bridges above the Sixth Avenue Bridge shall open on signal if at least 3 hours notice has been given.

(3) Advanced notice as required by this paragraph shall be given to the bridge operations officer,† police department, Saginaw.

§ 117.702 Black River, Port Huron, Mich.; bridges.

(a) The draws of the Military Street, and Seventh Street bridges shall open as follows:

(1) From May 1 through October 31—(i) From Monday through Saturday, except holidays, from 9 a.m. to 5:30 p.m., the draw need open only on the hour and half-hour; and

(ii) From 5:30 p.m. to 9 a.m., and on Sundays and holidays, the draw shall open on signal.

(2) During the months of April and November—(i) From 8 a.m. to 4 p.m., the draws shall open on signal; and

(ii) From 4 p.m. to 8 a.m., the draws shall open on signal if at least three hours notice is given.

(3) From December 1, through March 31, the draws shall open on signal if at least twenty-four hours notice is given.

(b) The draw of the Tenth Street bridge shall open as follows:

(1) From May 1 through October 31—(i) From 8 a.m. to 11 p.m., the draw shall open on signal; and

(ii) From 11 p.m. to 8 a.m., the draw shall open on signal if at least one hour notice is given.

(2) During the months of April and November, the draw shall open on signal if at least three hours notice is given.

(3) From December 1 through March 31, the draw shall open on signal if at least twenty-four hours notice is given.

(c) Signals. (1) The opening signal from the vessel for each of these bridges is one long blast followed by one short blast of a whistle, horn, siren, or by shouting.

(2) The acknowledging signal from the drawbridge is—(i) One long blast followed by one short blast when the draw will open promptly; and

(ii) Four short blasts when the draw will not open promptly, or is open and must be closed.

(d) The owners of or agencies controlling each bridge shall provide the necessary draw tenders and the proper mechanical appliances for the safe, prompt opening of the draw for the passage of vessels.

(e) Advance notice for the opening of the draws must be given to the dispatcher of the City of Port Huron Police Department.

(f) Public vessels of the United States, state or local government vessels used for public safety, and vessels in distress, shall be passed through the draws of these bridges as soon as possible at any time.

(g) The owner of or agency controlling each bridge shall keep a copy of the regulations in this section, together with a notice stating exactly how the dispatcher may be reached, conspicuously posted both upstream and downstream, either on the bridge or elsewhere in such a manner that it can easily be read from an approaching vessel at all times.

§ 117.703 Pine River, Mich.; Michigan State Highway bridge at St. Clair.

(a) The owners of or agencies controlling the bridge shall provide the necessary tenders and the proper mechanical appliances for the safe, prompt opening of the draw for the passage of vessels.

(b) The draw of the bridge shall be opened promptly on the hour and half hour for any vessels awaiting passage, except that between the hours of 2 a.m. and 8 a.m., from April 1 through November 30, the bridge will be opened upon request to the designated representative of the owner. During the winter months from December 1 through March 31 at least 24 hours' advance notice is required.

(c) Signals:

(1) *Opening signal.* One (1) long blast followed by one (1) short blast of a whistle, horn, or siren, repeated if necessary until the acknowledging signal is received from the drawtender.

(2) *Acknowledging signals.* (i) When the draw can be opened immediately, one (1) long blast followed by one (1) short blast.

(ii) When the draw cannot be opened immediately, four (4) or more short blasts in rapid succession. As soon thereafter as the draw can be opened, the drawtender shall sound one (1) long blast followed by one (1) short blast.

(d) The bridge shall not be required to open for pleasure craft which frequent this waterway and carry appurtenances unessential to navigation which extend above normal superstructure. The Commander, 9th Coast Guard

†517/755-0536 (1974)

District, may inspect such craft with a view to determining the applicability of this provision.

(e) Vehicles shall not be stopped on the bridge for the purpose of delaying its opening, nor shall watercraft be operated so as to hinder or delay the operation of the draw. All passages over or through the bridge shall be prompt to prevent undue delay to either land or water traffic.

(f) The owners of or agencies controlling the bridge shall keep a copy of these regulations conspicuously posted on both the upstream and downstream sides of the bridge, in such a manner that it may be easily read at any time. This will include directions for contacting the bridge tender or other authorized representatives of the owner.

(g) Vessels in distress and vessels owned or employed by agencies of the Federal, State, or local government in law enforcement or public safety activities shall be afforded the most expeditious passage through the draw as permitted by the provisions of paragraph (b) of this section.

§ 117.705 Rouge River, Mich., Short-Cut Canal and Rouge River between Short-Cut Canal and Maples Road; bridges.

(a) The regulations in this section shall govern the operation of all drawbridges across Short-Cut Canal and Rouge River between Short-Cut Canal and Maples Road.

(b) The owners of or agencies controlling the bridges shall provide the necessary tenders and the proper mechanical appliances for the safe, prompt, and efficient opening of the draws for the passage of vessels.

(c) Except as otherwise provided in paragraph (g) of this section, the draw of each bridge shall, upon verbal request or upon receiving the prescribed call signal (1) be opened immediately for the passage of a vessel of 20 tons and upward: *Provided*, That the opening of the draw of a railroad bridge may be delayed not to exceed 7 minutes after receipt of signal to permit the passage thereover of a mail or passenger train which is ready to cross at the time of the vessel signal and (2) be opened as soon as possible for the passage of a vessel or other watercraft of less than 20 tons: *Provided*, That no such vessel or other watercraft shall be delayed for a longer period than 15 minutes.

(d) Signals:

(1) *Call signal for opening of draw.* Three long blasts of a whistle, horn, or megaphone, or three loud and distinct strokes of a bell, sounded within signalling distance of the bridge: *Provided*, That the call signal for those bridges referred to in paragraph (g) of this section, to be given by vessels entitled to passage during closed periods under the provisions of paragraph (f) of this section, shall be four long blasts of a whistle, horn, or megaphone, or four loud and distinct strokes of a bell.

(2) *Acknowledging signals*—(i) *When draw can be opened immediately.* One long blast of a whistle or horn.

(ii) *When draw cannot be opened immediately.* Five short blasts of a whistle or horn to be followed by one long blast of a whistle or horn when the draw is to be opened.

(e) Trains and vehicles shall not be stopped on a bridge for the purpose of delaying its opening, nor shall watercraft be handled so as to hinder or delay the operation of the draw, but all passage over or through a bridge shall be prompt to prevent delay to either land or water traffic.

(f) The general regulations contained in paragraphs (a) to (e), inclusive, of this section shall apply to all bridges except as modified by the special regulations contained in paragraph (g) of this section, prescribed where local conditions require to govern the operation of certain bridges. The special regulations shall not apply to vessels owned or controlled by the United States Government or to vessels employed by the City of Detroit or other municipalities for police and fire protection or to a vessel in distress. All such United States and municipal vessels and vessels in distress, shall be passed through the draws of all bridges at any hour day or night.

(g) Jefferson Avenue and Fort Street highway bridges: From March 15 through December 15 the draws of these bridges need not be opened from 7:30 a.m. to 8:30 a.m., 4 p.m. to 4:40 p.m., and 5 p.m. to 6 p.m., except on Saturdays, Sundays, and legal holidays observed in the locality. However any vessel proceeding either upstream or downstream which has passed one of these bridges shall be afforded continuous passage through the other.

§ 117.705a Portage River, Ohio; The New York Central Railroad Company bridge at Port Clinton, Mile 1.51.

(a) The owners of or agencies controlling the bridge shall provide the necessary tenders and the proper mechanical appliances for the safe, prompt, and efficient opening of the draw for the passage of vessels.

(b) The draw of the bridge shall, upon receiving from a vessel the prescribed call signal, be opened immediately for the passage of the vessel: *Provided*, That the opening of the draw may be delayed not to exceed 7 minutes after receipt of signal to permit the passage thereover of a mail or passenger train which is ready to cross at the time of the vessel's signal: *Provided*, That no such vessel or other watercraft shall be delayed for a longer period than 15 minutes.

(c) Signals:

(1) *Call signal for opening of draw.* Three long blasts and one short blast of a whistle, horn, or siren, repeated at intervals until the acknowledging signal is received from the bridge tender.

(2) *Acknowledging signal.* Same as call signal.

(d) Trains and vehicles shall not be stopped on the bridge for the purpose of delaying the opening, nor shall watercraft be handled so as to hinder or delay the operation of the draw, but all passage over or through the bridge shall be prompt to prevent delay to either land or water traffic.

(e) The bridge shall not be required to open for pleasure craft carrying appurtenances unessential to navigation which extend above the normal superstructure. Upon request, the District Commander will cause an inspection to be made of the superstructures and appurtences of any such craft habitually frequenting the waterway.

(f) From May 1 through December 1 the draw shall open on signal. From December 2 through April 30 the draw shall open on signal if at least 24 hours' notice has been given.

(g) Clearance gages as prescribed by the Commandant shall be installed on the upstream and downstream sides of the bridge.

(h) The owner of or agency controlling this bridge shall post notice containing the provisions of these regulations both upstream and downstream of the drawbridge, on the bridge, or elsewhere in such a manner that they can easily be read at all times from an approaching vessel. The notice shall state how the authorized representative may be reached.

§ 117.705b Portage River, Ohio; Monroe Street Bridge, Portage, Ohio.

(a) The owners of or agencies controlling the bridge shall provide the necessary tenders and the proper mechanical appliances for the safe, prompt, and efficient opening of the draw for the passage of vessels.

(b) From May 1 through December 1 the draw shall open on signal, except that from 6 p.m. to 12 p.m. on Fridays, and 6 a.m. to 12 p.m. on Saturdays, Sundays, and legal holidays from May 15 through October 31, the draw shall open for the passage of vessels from 3 minutes before to 3 minutes after the hour and half hour. From December 2 through April 30 the draw shall open on signal if at least 24 hours' notice has been given.

(c) Signals:

(1) Opening signal. One long blast followed by one short blast of a whistle, horn, or siren.

(2) Acknowledging signal. One long blast followed by one short blast.

(3) When the draw cannot open immediately or is to close. Four short blasts.

(d) Vehicles shall not be stopped on the bridge for the purpose of delaying the opening, nor shall watercraft be handled so as to hinder or delay the operation of the draw, but all passages over or through the bridge shall be prompt to prevent delay to either land or water traffic.

(e) The bridge shall not be required to open for pleasure craft carrying appurtenances unessential to navigation which extends above the normal superstructure. Upon request, the District Commander will cause an inspection to be made of the superstructures and appurtenances of any craft habitually frequenting the waterway.

(f) Clearance gages as prescribed by the Commandant shall be installed on the upstream and downstream sides of the bridge.

(g) The owner of or agency controlling this bridge shall post notice containing the provisions of these regulations both upstream and downstream of the drawbridge, on the bridge, or elsewhere in such a manner that they can easily be read at all times from an approaching vessel. The notice shall state how the authorized representative may be reached.

§ 117.706 Sandusky Bay, Ohio.

(a) *Penn Central Railroad Co. bridge between Baybridge and Danbury.* (1) This bridge shall be opened promptly on signal from April 1 through October 31 and from 8 a.m. to 4 p.m. from November 1 through November 30. A 24-hour advance notice is required at all other times. This notice shall be given to the Chief Dispatcher, Central Union Terminal, Toledo, Ohio.

(2) The call signal for opening of the draw shall be three long blasts of a whistle or horn, sounded at such distance from the bridge as to permit the vessel to stop if the draw cannot be opened, and repeated if not acknowledged.

(3) If the draw can be opened immediately, the call signal shall be acknowledged by one long blast of a whistle or horn. If the draw cannot be opened immediately, the draw tender shall sound a warning or danger signal of five short, rapid blasts of a whistle or horn, and the vessel shall change its course or stop and shall not proceed toward the bridge until the draw tender sounds one long blast.

(4) The draw shall be opened to full open position with the least possible delay on receiving the call signal.

(5) Trains shall not be stopped on or near the bridge for the purpose of delaying its opening, nor shall watercraft be navigated so as to hinder or delay the operation of the draw, but all passage over or through the bridge shall be prompt to prevent delay to either rail or water traffic.

(6) The owner of or agency controlling the bridge shall keep conspicuously posted on both the east and west sides thereof, in such manner that they can be easily read from approaching vessels, signs showing the call and acknowledging signals prescribed in subparagraphs (2) and (3) of this paragraph.

(b) *Ohio Department of Highways bridge between Martin Point and Danbury.* (1) The owner of or agency controlling this bridge shall provide the necessary drawtender and the proper mechanical appliances for the safe, prompt opening of the draw for the passage of vessels except when ice prevents navigation.

(2) The opening signal and the acknowledging signal shall be those prescribed in paragraph (a) (2) and (3) of this section.

(3) The draw shall open on signal from 7 a.m. to 11 p.m. From 11 p.m. to 7 a.m. the draw need not open, except when at least two hours notice is given.

(4) Advance notification should be given to the Sandusky Post, State Highway Patrol.

(5) Public vessels of the United States, vessels in distress, and state or local government vessels used for public safety shall be passed through the draw of this bridge as soon as possible at any time even though the close periods may be in effect.

(6) The owner or agency controlling the bridge shall keep a copy of the regulations in this section, together with a notice stating exactly how the Sandusky Post, State Highway Patrol, may be reached, conspicuously posted both upstream and downstream, either on the bridge or elsewhere in such a manner that it can be easily read from an approaching vessel at all times.

(c) *The New York Central Railroad Company Bridge across East Cove at foot of Washington Street, Sandusky.*

(1) The draw shall be in full open position at all times from March 16 to December 31, inclusive, except that it may be closed five minutes in advance of the time a train is expected to cross the bridge. The cycle of the draw from open position through closed position to open position shall not exceed 20 minutes.

(2) Five minutes in advance of the start of closing, the draw tender shall signal boat operators that the draw is to be closed by hoisting a four-foot by six-foot white pennant on a staff located at the northerly end of the bridge, clearly visible from Sandusky Bay and East Cove, and by sounding five short blasts of a whistle, horn, or magaphone or by ringing a bell continuously for five seconds.

(3) A train shall not be stopped on the bridge for the purpose of delaying its opening, nor shall watercraft be navigated so as to hinder or delay the operation of the draw, but all passage over or through the bridge shall be prompt to prevent delay to either rail or water traffic.

(4) From January 1 to March 15, inclusive, whenever a vessel unable to pass under the closed bridge desires to pass through the draw, at least 24 hours' advance notice of the time the opening is required shall be given to the authorized representative of the owner of or agency controlling the bridge.

(5) Upon receipt of such advance notice, the authorized representative shall arrange for the prompt opening of the draw at the time specified in the notice for the passage of the vessel.

(6) The owner of or agency controlling the bridge shall keep conspicuously posted on both sides thereof, in such manner that it can be easily read at any time, a copy of the regulations in this paragraph together with a notice stating exactly how the representative specified in subparagraph (4) of this paragraph may be reached.

§ 117.706a Ashtabula River, Ashtabula, Ohio; bridges.

(a) *Ashtabula County Commissioners Fifth Street bridge.* (1) The owner of or agency controlling the bridge shall keep a drawtender in constant attendance.

(2) The bridge shall be opened promptly upon signal for the passage of commercial and emergency vessels.

(3) The bridge shall be opened promptly on the hour and half hour for all other floating craft that may desire passage through the draw.

(4) The call signal for opening the draw shall be three long blasts of a whistle or horn, sounded at such distance from the bridge as to permit the vessel to stop if the draw cannot be opened, and repeated if not acknowledged.

(5) If the draw can be opened immediately, the call signal shall be acknowledged by one long blast of a whistle or horn. If the draw cannot be opened immediately, the drawtender shall sound a warning or danger signal of five short, rapid blasts of a whistle or horn, and the vessel shall stop and not proceed toward the bridge until the drawtender sounds one long blast.

(b) *The New York Central Railroad bridge.* (1) The owner of or agency controlling the bridge shall keep a drawtender in constant attendance except as follows: between the hours of 11 p.m. and 7 a.m., from 1 April to 1 December and the entire period from 1 December to 1 April.

(2) The bridge shall be opened promptly upon signal for the passage of all vessels during the period when a drawtender is in attendance.

(3) The call signal for opening the draw and acknowledging signals shall be those prescribed in paragraphs (a)(4) and (a)(5) of this section.

(4) Whenever a vessel is unable to pass under the closed draw and desires to pass through the draw during the periods of closure specified in subparagraph (1) of this paragraph, at least 24 hours' advance notice of the time the opening is required shall be given to the authorized representative of the owner of or agency controlling the bridge.

(5) Upon receipt of such advance notice, the authorized representative shall arrange for the prompt opening of the draw as specified in the notice for the passage of the vessel.

(6) The owner of or agency controlling the bridge shall keep conspicuously posted on both the upstream and downstream sides thereof, in such manner that it can be easily read at any time, a copy of the regulations in this paragraph together with a notice stating exactly how the representative specified in subparagraph (4) of this paragraph may be reached.

§ 117.707 Buffalo Harbor, N.Y.; City of Buffalo bridges across Buffalo River.

(a) The draw of the Michigan Avenue bridge across the Buffalo River need not open for the passage of vessels from 7:30 a.m. to 9 a.m. and 4 p.m. to 5:45 p.m.

(b) The draw of the Ohio Street bridge across the Buffalo River need not open for the passage of vessels from 7:30 a.m. to 9 a.m. and 4 p.m. to 5:45 p.m.

(c) The South Park Avenue bridge across Buffalo River will not be required to open for the passage of vessels from 7:00 to 8:30 a.m. and 4:30 to 6:00 p.m.

(d) The closed periods prescribed in this section shall not be effective on Sundays and on New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, and Christmas Day or days observed in lieu of any of these under State law.

(e) The draws of these bridges shall be opened promptly on signal for the passage of any vessel at all times during the day or night except as otherwise provided in this section.

§ 117.707a Niagara River; City of Buffalo Ferry Street Bridge across Black Rock Channel.

The clear headroom under the bridge at low water datum is 17.3 feet for a width of 86 feet from the pivot pier, thence decreasing to 12.3 feet at the left (westerly) abutment.

(a) All vessels and boats which cannot pass under the bridge shall, on approaching the bridge, reduce speed sufficiently to enable them to come to a dead stop without touching the bridge in case the movable span cannot be lifted. If the wind is dangerously strong, passage shall not be attempted by large vessels without the aid of a tug or tugs.

(b) Vessels and boats bound north shall have the right-of-way and priority for passage through the bridge over those bound south.

(c) All vessels and boats desiring passage through the bridge shall signal therefor by one long and two short whistle blasts.

(d) Upon receiving the opening signal, the bridge operator shall answer by giving the same signal on the bridge whistle and he shall then proceed at once to lift the bridge.

(e) In case the bridge cannot be lifted, for any cause, the bridge operator shall answer a vessel signal by giving five (5) short whistle blasts; and the vessel shall then be stopped until the bridge is ready to be lifted, when the bridge operator shall give the whistle signal for passage and the vessel may proceed.

(f) In case the bridge is disabled so that it cannot be lifted for one-half hour or more pending repairs, red flags will be displayed on the bridge in daytime and two red lantern lights, one above the other, at night. When such signals are displayed no vessel or boat shall signal for or attempt passage through the bridge.

§ 117.708 Niagara River; Canadian National Railway bridge (International Bridge) between Buffalo, N.Y., and Fort Erie, Ontario, Canada.

The draw need not open for the passage of vessels. However, the draw shall be returned to operable condition within six months after notification from the Commandant, U.S. Coast Guard, to take such action.

§ 117.709 Genesee River, Rochester, N.Y., Stutson Street and Penn Central Railroad bridges.

(a) The owners of or agencies controlling these drawbridges shall provide the necessary tenders and the proper mechanical appliances for the safe, efficient openings of the draws.

(b) The draw of the Penn Central Railroad bridge shall open on signal from April 1 through December 15. From December 16 through March 31 the draws shall open on signal if at least 12 hours notice is given.

(c) The draw of the Stutson Street bridge need not open for the passage of vessels from April 1 through December 15 from 7 a.m. to 9 a.m. and 4 p.m. to 6 p.m., Monday through Friday, except Federal holidays. However, during these periods, the draw shall open on signal for public vessels of the United States, vessels in distress and vessels seeking shelter from rough weather. At all other times from April 1 through December 15, including Federal holidays, the draw shall open on signal. From December 16 through March 31 the draw shall open on signal if at least 12 hours notice is given.

(d) Signals: (1) Opening signal: One long blast followed by one short blast of a whistle, horn, siren, or by shouting.

(2) Acknowledging signals: (i) When the draw can be opened, same as opening signal.

(ii) When the draw cannot be opened or is open and must be closed—4 short blasts, repeated at regular intervals until acknowledged by the vessel sounding the same signal. As soon as the draw can be opened again, the draw tender shall sound the opening signal.

(iii) In lieu of the sound signals, the draw tender may use a white light located on top of the draw tenders house to indicate that the draw will open promptly.

(e) Clearance gauges, of a type approved by the Commandant, shall be installed on the upstream and downstream sides of each drawbridge by and at the expense of the owner of or agency controlling the bridge and such gauges shall be kept in good repair and legible condition.

PART 118—LIGHTING OF BRIDGES*

§ 118.1 General requirements.

All persons owning, occupying or operating bridges over the navigable waters of the United States shall maintain at their own expense such lights and other signals required for safety of maritime navigation as may be prescribed by the Commandant, and on any international bridge constructed after March 23, 1906, such additional signals as may be prescribed by the Commandant.

§ 118.5 Penalty for failure to maintain.

Any person required to maintain lights and other signals upon any bridge or abutment over or in the navigable waters of the United States who fails or refuses to maintain such lights and other signals, or to obey any of the lawful rules and regulations relating to the same is subject to a penalty as provided in 14 U.S.C. 85.

§ 118.10 Interference or obstruction prohibited.

No person shall obstruct or interfere with any lights or signals maintained in accordance with the regulations prescribed in this part.

§ 118.15 Penalty for interference or obstruction.

Any person violating the provisions of § 68.01–10** of this chapter shall be deemed guilty of a misdemeanor and be subject to a fine not exceeding $500 for each offense. Each day during which such violation shall continue shall be considered a new offense.

§ 118.35 Signals pertaining to the operation of bridges.

Lights and signals necessary for the execution of rules and regulations pertaining to the operation of bridges issued by the Secretary of the Army will be prescribed by the District Engineer.

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*Bridges over navigable waters of the United States which are required to be lighted for the protection of navigation are lighted in accordance with 33 CFR Part 118 (extract follows). This system delineates piers and channel margins by means of 180° fixed red lights. In addition, non-movable spans have a mid-channel range indicated by 360° fixed green lights just below the low steel of the navigation span(s). Movable spans have a combination light that shows red when closed and green when open. Minimum lighting requirement diagrams are published in the Great Lakes Light List.

**Corrected to § 118.10.

§ 118.50 Inspection.

Lights and signals maintained as required by the provisions of this chapter are subject to inspection at any time by the Coast Guard or such agent as may be appointed by the Commandant.

§ 118.55 Periods of operation.

(a) Lights shall be displayed from sunset to sunrise and at other times when the visibility is less than one mile.

(b) Operators shall not be required to exhibit the prescribed lights during seasons when vessels are unable to navigate in the vicinity of the bridge.

(c) The operation of signals other than lights shall be as prescribed by the District Commander. Each case shall be considered individually.

§ 118.60 Visibility of lights.

All lights required by the regulations in this part shall be securely attached to the structure and shall be of sufficient candlepower as to be visible against the background lighting at a distance of at least 2,000 yards 90 percent of the nights of the year. They shall be located as prescribed by the Commandant, with colors and arcs of visibility as specified.

§ 118.65 Lights on fixed bridges.

(a) Each fixed bridge span over a navigable channel shall be lighted so that the center of the navigable channel under each span will be marked by a range of two green lights, and each margin of each navigable channel will be marked by a red light: *Provided*, That when a margin of a channel is limited by a pier, only those lights prescribed in paragraph (b) of this section shall be required to mark such channel margin. The green lights shall each show through a horizontal arc of 360°; they shall be securely mounted just below the outermost edge of the bridge span structure so as to be visible from an approaching vessel. Each red light shall show through a horizontal arc of 180°, and shall be securely mounted just below the outermost edge of the bridge span structure to show 90° on either side of a line parallel to the axis of the channel so as to be visible from an approaching vessel.

NOTE: Until such time that major repairs to or replacements of existing fixed span navigation lights colored green are made, it is permitted that only one of these lights marking the centerline of the same channel under a span shall be visible to an approaching vessel. When major repairs to or replacement of such existing green lights are made they shall conform with this paragraph.

(b) *Pier lights.* When the navigable channel extends from pier to pier or when piers are located within the navigable channel, each end of such piers shall be lighted with a red light. Each such light shall show through a horizontal arc of 180°, and shall be securely fastened at the end of the pier as low as practicable but not lower than 2 feet above navigable high water to show 90° on either side of a line parallel to the axis of the channel so as to be visible from an approaching vessel.

(c) *Main channel.* When necessary, the District Commander may prescribe that fixed bridges having two or more spans over a navigable channel shall have the main channel span marked with a set of three white lights arranged in a vertical line directly above each green light on the main channel span. Each white light shall show through a horizontal arc of 180°, and shall be mounted so that ½ of the horizontal arc will show on either side of a line parallel to the axis of the channel. These three white lights shall be securely mounted on the bridge structure and spaced as nearly 15 feet apart as the structure of the bridge will permit, with a minimum spacing of 7 feet. The lowest white light in the line of three lights shall be placed not less than 10 nor more than 15 feet above each green light on the main channel span.

NOTE: Until such time that major repairs to or replacements of existing main channel lights showing white are made, it is permitted that these lights show through a horizontal arc of not less than 60° nor more than 180° with ½ of such arc showing either side of a line parallel to the axis of the main channel. When major repairs or replacement of such existing white lights are made, they shall conform with this paragraph.

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§ 118.70 Lights on swing bridges.

(a) *Swing span lights on through bridges.* Each swing span of every through swing bridge shall be lighted with three lanterns so that when viewed from an approaching vessel the swing span when closed will display three red lights on top of the span structure, one at each end of the span on the same level and one at the center of the span no less than 10 feet above the other two lights, and when open for navigation will display three green lights on top of the span structure in a line parallel to and directly above the long axis of the span, one at each end of the span on the same level, and one at the center of the span no less than 10 feet above the other two lights. Each lantern shall show through alternate red and green horizontal arcs of 60° each, the axis of adjacent arcs to be 90° from each other; each light shall be securely mounted with the axis of the green arcs parallel to the long axis of the swing span.

(b) *Swing span lights on deck and half-through bridges.* Each swing span of every deck, half-through, girder, or similar type swing bridge shall be lighted with four lanterns so that when viewed from an approaching vessel the swing span when closed will display one red light at each end, and when open to navigation will display two green lights from each end. Each lantern shall show through one red and two green horizontal arcs of 60° each, the axis of each green arc to be 90° from the axis of the red arc; each light shall be securely mounted at the floor level of the span as near to the side of the span as practicable with the axis of the red light normal to the long axis of the swing span and so that the red light will be visible from an approaching vessel when the span is closed.

(c) *Pier lights.* Every swing bridge shall be lighted so that each end of the piers adjacent to the navigable channel (draw piers) or each end of their protection piers, (draw pier protection piers) and each end of the piers protecting the pivot pier (pivot protection pier) will be

marked by a red light. Each of these lights shall show through a horizontal arc of 180° and shall be mounted as low as practicable below the floor level of the swing span to show 90° on either side of a line parallel to the axis of the channel so as to be visible from an approaching vessel.

(d) *Axis lights.* Every swing bridge shall be lighted so that the intersection of the bridge axis with each side of the pivot pier and the channel side of each draw pier which has a protection pier will be marked by a red light: *Provided,* That if the draw and draw protection piers are straight along their channel faces these lights shall not be required. Each such light shall show through a horizontal arc of 180°, and shall be mounted on the navigable channel face of the pier as low as practicable below the floor level of the swing span to show 90° either side of a line normal to the axis of the navigable channel so as to be visible from an approaching vessel.

(e) *Omission of lights.* Where the permanent navigable channel passes on only one side of the pivot pier of any swing span, the District Commander may authorize the omission of lighting of the unused channel.

§ 118.75 Lights on single-opening drawbridges.

(a) *Bridges in this class.* Bridges of the folding, pontoon and similar type single opening drawbridges are included in this class.

(b) *Draw span lights.* Each draw span of every single opening drawbridge shall be lighted with two lanterns so that when viewed from an approaching vessel the draw span when closed will display two red lights, one at each end of the span and when open to navigation will display two green lights, one at each end of the span. Each lantern shall show alternate red and green horizontal arcs of 60° each, the axis of adjacent arcs to be located 90° from each other; each lantern shall be securely mounted 15 feet above the roadway with the axis of the green arcs parallel to the long axis of the swing span.

(c) *Pier or abutment lights.* Every swing bridge shall be lighted so that the end of each pier, abutment or fixed portion of the bridge adjacent to the navigable channel through the draw, or each end of the protection piers for such piers, abutments, or fixed portion of the bridge will be marked by a red light. Each red light shall show through an arc of 180°, and shall be securely mounted on the pier, abutment or fixed portion of the bridge as low as practicable to show 90° on either side of a line parallel to the axis of the channel so as to be visible from an approaching vessel.

§ 118.80 Lights on bascule bridges.

(a) *Lift span lights.* Each lift span of every bascule bridge shall be lighted so that the free end of the span will be marked on each side by a green light which shows only when the span is fully open for the passage of a vessel and by a red light which shows for all other positions of the lift span. Each red and each green light shall show through a horizontal arc of 180°. The lighting apparatus shall be securely mounted to the side of the span so that the light will show equally on either side of a line parallel to the axis of the channels, so that they will be visible from an approaching vessel.

NOTE: Until such time that major repairs to or replacement of lift span navigation lights are made, existing lights may show through a horizontal arc of less than 180°. When major repairs to or replacement of existing lights are made they shall conform with this paragraph.

(b) *Multiple parallel lift span lights.* The outermost side of each outer span of every bascule bridge with parallel multiple lifts shall be lighted as prescribed in paragraph (a) of this section; the lights shall be controlled so that the green lights will be displayed only when all spans are open for navigation. The inner sides of each outer lift span and both sides of each inner lift span of such bascule bridge shall be lighted by red lights for all positions of the lift span. These lights shall have the same arcs of illumination and shall be mounted as described in paragraph (a) of this section.

(c) *Pier lights.* Every bascule bridge shall be lighted so that each end of every pier, or protection pier where provided, in or adjacent to the navigable channels under the lift span or spans will be marked by a red light. Each such red light shall show through a horizontal arc of 180°, and shall be securely mounted as low as practicable on the end of the pier, or protection pier, to show 90° either side of a line parallel to the axis of the navigable channel so as to be visible from an approaching vessel.

(d) *Axis lights.* Every bascule bridge which has at least one pier provided with a protection pier shall be lighted so that the intersection of the long axis of the lift span with the channel side of each pier, or protection pier, will be marked by a red light: *Provided,* That if all such piers and protection piers are straight along their channel faces these lights shall not be required. Each such red light shall show through a horizontal arc of 180° and shall be securely mounted on the navigable channel face of the pier as low as practicable to show 90° on either side of a line normal to the axis of the navigable channel so as to be visible from an approaching vessel.

§ 118.85 Lights on vertical lift bridges.

(a) *Lift span lights.* The vertical lift span of every vertical lift bridge shall be lighted so that the center of the navigable channel under the span will be marked by a range of two green lights when the vertical lift span is open for navigation, and by one red light on each side for all other positions of the lift span. The green lights shall each show through a horizontal arc of 360°; they shall be securely mounted just below the outermost edge of the bridge span structure so as to be visible from an approaching vessel. Each red light shall show through a horizontal arc of 180°, and shall be securely mounted just below the outermost edge of the lift span to show 90° on either side of the line parallel to the axis of the channel so that only one such light will be visible from an approaching vessel.

NOTE: Until such time that major repairs to or replacement of lift span navigation lights are made, it is permitted that these lights show through a horizontal arc of not more than 60°. When major repairs to or replacement of such existing lights are made they shall conform with this paragraph.

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(b) *Pier lights.* Every vertical lift bridge shall be lighted that each end of every pier in or adjacent to navigable channels under the lift span, or each end of every protection pier when provided, will be marked by a red light. Each such light shall show through a horizontal arc of 180°, and shall be securely mounted as low as practicable on the end of the pier, or the protection pier, to show 90° on either side of a line parallel to the axis of the navigable channel so as to be visible from an approaching vessel.

(c) *Axis lights.* Every lift bridge which has at least one pier provided with a protection pier shall be lighted so that the intersection of the lift span axis with the channel side of each pier adjacent to the navigable channel will be marked by a red light: *Provided*, That if every such pier, or protection pier, is straight along its channel face these lights shall not be required. Each such light shall show through a horizontal arc of 180°, and shall be securely mounted on the navigable channel face of the pier as low as practicable to show 90° on either side of a line normal to the axis of the navigable channel so as to be visible from an approaching vessel.

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§ 118.95 Lights on sheer booms.

The lights on sheer booms, isolated piers, and obstructions not part of the bridge or bridge approach structure come under the purview of § 66.01–35 of subchapter C of Title 33 of the Code of Federal Regulations and shall show a white or green light if kept on the left of vessels approaching from seaward, and shall show a white or red light if kept on the right of vessels approaching from seaward. For rivers the same rule shall apply, white or green lights shall be shown from the right descending bank; white or red lights to be shown from the left descending bank. The color of the light and its characteristics (fixed, flashing, occulting, etc.) shall be determined by the District Commander.

§ 118.100 Modification of requirements.

The District Commander may modify or change the requirements for the display of lights and signals on any bridge within the purview of the regulations in this part when a change in local conditions warrant such modification.

§ 118.105 Bridges infrequently used and unusual cases.

Bridges over waterways with no significant nighttime navigation may be exempted from the lighting requirements of this part in whole or in part with the approval of the district commander. The district commander may modify the prescribed lights or require special lighting in specific or unusual cases where the lights prescribed in this part may not provide adequately for the safe passage of nighttime navigation.

PART 122—SAFETY MEASURES

Sec.

122.01 General.
122.10 Atomic attack instructions for merchant vessels in port.

§ 122.01 General.

The regulations in this part require additional safety precautions for vessels in accordance with § 6.14–1 of this chapter.

§ 122.10 Atomic attack instructions for merchant vessels in port.

A placard (Form CG 3256) containing atomic attack instructions for merchant vessels in port has been prepared for the information and assistance of persons on board merchant vessels. When given to the master of a vessel by the Coast Guard, the placards (Form CG 3256) shall be posted in conspicuous places in the pilothouse, engineroom, and in the seamen's, firemen's and steward's departments of the vessel.

PART 124—CONTROL OVER MOVEMENT OF VESSELS

Sec.

124.01 General.
124.10 Advance notice of vessel's time of arrival to Captain of the Port.
124.14 Advance notice of arrival of vessel laden with explosives or certain specified dangerous cargoes.
124.16 Advance notice of fire or other abnormal condition on arriving vessel.
124.20 Penalties for violations.

§ 124.01 General.

The regulations in this part implement the general enforcement provisions in Executive Order 10173, as amended, and designated §§ 6.04–1 to 6.04–11 of this chapter.

§ 124.10 Advance notice of vessel's time of arrival to Captain of the Port.

(a) The master or agents of every registered vessel of the United States, and every foreign vessel arriving at a United States port or place from a port or place outside the United States, or any such vessel destined from one port or place in the United States to another port or place in the United States, shall give at least 24 hours advance notice of arrival to the Captain of the Port at every port or place where the vessel is to arrive, except as follows:

(1) Registered United States pleasure vessels and registered United States fishing vessels are not required to submit advance notice of arrival report.

(2) When the port of arrival is not located within the geographical area assigned to a particular Captain of the Port, this advance notice of time of arrival shall be made to the Commander of the Coast Guard District in which such port or place is located.

(3) When the arrival is a direct result of the operation of "force majeure," and it is not possible to give at least 24 hours advance notice of time of arrival, then advance notice as early as practicable shall be furnished.

(4) When the vessel, while in United States waters, does not navigate any portion of the high sea, i.e. does

not navigate beyond the low water mark along the coasts or beyond the waters contained within the headlands of the United States.

(5) When a vessel is engaged upon a scheduled route if a copy of the schedule is filed with the Captain of the Port for each port of call named in the schedule and the times of arrival at each such port are adhered to.

(6) When the master of a merchant vessel (except on a coastwise voyage of 24 hours or less) reports in accordance with the U.S. Coast Guard's voluntary Automated Merchant Vessel Report (AMVER) System, he shall be considered to be in constructive compliance with the requirements of paragraph (a) of this section and no additional advance notice of vessel's arrival reports to the Captain of the Port is required. The master or agent of a vessel on coastwise voyages of 24 hours or less shall report the advance notice of vessel's arrival to the Captain of the Port at next port of call prior to or upon departure from port.

(7) For that vessel which is engaged in operations in and out of the same port to sea and return without entering any other port, or on coastwise voyages between ports in the same Coast Guard District, or on voyages between ports in the First, Ninth, Thirteenth, or Seventeenth Coast Guard Districts and adjacent Canadian ports, or between ports in the Commonwealth of Puerto Rico and ports in the Lesser Antilles, or between ports in the Lesser Antilles, or between ports on the east coast of Florida and the Bahama Islands, the Coast Guard District Commander having jurisdiction may, when no reason exists which renders such action prejudicial to the rights and interests of the United States, prescribe conditions under which such vessels may be considered by the Captains of the Port as being in constructive compliance with the requirements of this section.

(8) A westbound vessel which is to proceed to or through United States waters of the St. Lawrence River and/or the Great Lakes shall be subject to compliance with paragraph (b) of this section.

(b) The master or agent of every vessel other than vessels of United States or Canadian nationality engaged in the coastal trade of their respective countries or in trade between their two countries without calling at any other country en route, when proceeding westbound to United States waters of the St. Lawrence River and/or the Great Lakes shall:

(1) At least 24 hours in advance of the vessel's arrival at the Snell Lock, Massena, New York, advise the Commander, Ninth Coast Guard District, Cleveland, Ohio, of estimated time of arrival of such vessel at the Snell Lock.

(2) In addition, at least 24 hours in advance of the vessel's arrival at the first United States port-of-call, advise the Commander, Ninth Coast Guard District, Cleveland, Ohio, of the estimated time of arrival at that port.

(3) [Reserved]

(4) A master of a vessel who reports in accordance with the U.S. Coast Guard's voluntary Automated Merchant Vessel Report (AMVER) System and who includes in this report an estimated time of arrival at the Snell Lock, Massena, New York, shall be considered to be in constructive compliance with the requirements of subparagraph (1) of this paragraph and no additional advance notice of vessel's arrival at the Snell Lock is required. Likewise a master of such vessel who indicates in this report the name of the first intended United States port of call and estimated time of arrival at that port shall be considered in constructive compliance with subparagraph (2) of this paragraph and no additional advance notice of arrival is required.

(5) A master or agent of a vessel who files a copy of the scheduled route with the Commander, Ninth Coast Guard District, Cleveland, Ohio, at least 24 hours prior to arrival at Snell Lock, and who includes in the schedule the estimated time of arrival at the Snell Lock, Massena, N.Y., shall be considered to be in constructive compliance with requirements of subparagraph (1) of this paragraph and no additional advance notice of the vessel's arrival at the Snell Lock is required. Likewise, a master or agent of such vessel who indicates in this schedule the name of the first intended United States port of call and estimated time of arrival at that port shall be considered in constructive compliance with subparagraph (2) of this paragraph and no additional advance notice of arrival is required.

(6) When the arrival is a direct result of the operation of "force majeure," and it is not possible to give at least 24 hours advance notice of time of arrival, then advance notice as early as practicable shall be furnished.

§ 124.14 Advance notice of arrival of vessel laden with explosives or certain specified dangerous cargoes.

(a) The master, agent, or person in charge of any domestic or foreign vessel which is bound for a port or place in the United States and which is carrying as cargo any of the dangerous cargoes described in this paragraph, whether for discharge in the United States or not, shall at least 24 hours in advance of arrival at each port or place, notify the Captain of the Port or the Commander of the Coast Guard District in which such port or place is located concerning the amount and location of stowage on board the vessel of any of the following:

(1) Explosives, Class A (commercial or military).

(2) Oxidizing materials for which a special permit for water transportation is required by 46 CFR 146.22.

(3) Radioactive materials for which a special approval by the Commandant for water transportation is required by 46 CFR 146.25–30.

(4) Any dangerous cargo considered to involve a particular hazard, when transported or handled in bulk quantities, as further described in paragraph (b) of this section.

(b)(1) A dangerous cargo considered to involve a particular hazard, when transported in bulk quantities on board vessels, or when handled in bulk quantities on waterfront facilities, is any commodity which by virtue

of its properties would create an unusual hazard if released. The commodities subject to this section are:

Acetaldehyde.
Acetone Cyanohydrin.
Acrolein.
Acrylonitrile.
Allyl chloride.
Ammonia, anhydrous.
Butadiene.
Butane.
Butene.
Butylene Oxide.
Carbon Disulfide.
Chlorine.
Chlorosulfonic Acid.
Dimethylamine.
Epichlorohydrin.
Ethane.
Ethylene.
Ethylene Oxide.
Ethylenimine.
Ethyl Ether.
Hydrofluoric Acid, aqueous (70 percent).
Hydrogen Chloride, anhydrous
Hydrogen Fluoride, anhydrous.
Methane.
Methyl Acetylene, Propadiene Mixture, stabilized
Methyl Bromide.
Methyl Chloride.
Motor Fuel Antiknock Compounds containing Lead Alkyls.
Oleum.
Phosphorus, elemental.
Propane.
Propylene.
Propylene Oxide.
Sulfur Dioxide.
Toluene Diisocyanate.
Vinyl Chloride.

(2) Each commodity listed in subparagraph (1) of this paragraph is considered to possess one or more of the following properties:

(i) Is highly reactive or unstable; or

(ii) Has severe or unusual fire hazards; or

(iii) Has severe toxic properties; or

(iv) Requires refrigeration for its safe containment; or

(v) Can cause brittle fracture of normal ship structural materials or ashore containment materials by reason of its being carried at low temperatures, or because of its low boiling point at atmospheric pressure (unless uncontrolled release of the cargo is not a major hazard to life).

(c) For U.S. vessels, this section is applicable to such vessels on international voyages, coastwise voyages, or Great Lakes voyages. For foreign vessels this section is applicable to such vessels when bound to a port or place in the United States, or a port or place under the jurisdiction of the United States.

(d) When the arrival is a direct result of "force majeure," and it is not possible to give at least 24 hours' advance notice, then advance notice as early as possible shall be furnished.

§ 124.16 Advance notice of fire or other abnormal condition on arriving vessel.

(a) The master, agent, or person in charge of any domestic or foreign vessel which is bound for a port or place in the United States shall give notice to the Captain of the Port or the Commander of the Coast Guard District in which such port or place is located as early as possible in advance of arrival of any fire or other abnormal condition which may jeopardize the vessel's safety or that of other vessels or facilities in port.

§ 124.20 Penalties for violations.

Failure to give advance notice will subject the master or agents of a vessel to the penalties of fine and imprisonment, as well as subject the vessel to seizure and forfeiture, as provided in section 2, Title II of the Act of June 15, 1917, as amended, 50 U.S.C. 192. In addition, such failure may result in delay in the movement of the vessel from the harbor entrance to her facility destination within the particular port.

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PART 162—INLAND WATERWAYS NAVIGATION WATERWAYS

§ 162.110 Duluth-Superior Harbor, Minn., and Wis.; use, administration, and navigation, and bridge regulations.

(a) Navigation regulations—(1) Speed of vessels. (i) Vessels will not be restricted as to speed while passing through the channels between entrance piers, but vessels of 300 gross tons and upward shall not exceed 8 miles per hour while running through any of the dredged channels within the harbor.

(ii) When approaching a bridge (excepting the Duluth Ship Canal bridge) the speed shall be reduced enough to enable the vessel, in case the draw fails to open, to come to a dead stop without striking the bridge.

(iii) No restrictions as to speed are required for passing the Duluth Ship Canal bridge. However, vessels approaching this bridge should make such reductions in speed as the currents and weather conditions will permit and still allow for safe passage through the canal.

(iv) While passing all other bridges under ordinary conditions of weather the speed should not exceed 6 miles per hour. A greater speed will be allowed when necessary for steerage as when running light in a wind.

(v) A steamer must employ a tug or tugs whenever the conditions of weather of currents make the passage difficult or dangerous to either the vessel or the bridge.

(2) Passing in Duluth Ship Canal. Self-propelled vessels exceeding 300 gross tons, and barges or scows exceeding (light) 100 displacement tons, shall not pass within the canal. Inbound vessels shall have the right of way.

(3) Anchorage of vessels. (i) Vessels shall not anchor in the entrance canals, or in any of the navigable channels, except in the harbor basins, and then only where not in the way of passing vessels.

(ii) Vessels and rafts shall not be anchored or otherwise fastened where they are liable to swing into the channels by reason of a wind or current.

(iii) The position and arrangement of vessels lying at anchor in the harbor basin shall be subject to the direction of the District Commander, or his authorized representatives, and vessels shall, when so directed, promptly shift their position to another part of the basin.

(4) Dragging anchors. No vessel shall be towed while the anchor of such vessel is down or dragging at the bottom of the channel.

(5) Towing through bridges. Freight steamers shall not tow consorts astern while passing through the bridges of

this harbor, the Duluth Ship Canal bridge excepted. Towing alongside the steamer will, however, be permitted.

(6) Patrol signals. (i) Three short blasts of the signal whistle when sounded from a patrolling vessel will indicate that the vessel to which such signal is given is proceeding at too high a rate of speed, and such vessel must immediately moderate its speed.

(ii) Three long blasts of the signal whistle followed by two short blasts when sounded from a patrolling vessel, will indicate that the vessel to which such signal is given must stop until further orders from the patrolling vessel.

(iii) One long blast, followed by four short blasts, when sounded from the patrolling vessel, will indicate that the vessel to which such signal is given may proceed on its course.

(7) Other requirements. (i) No vessel shall be moored to any United States pier.

(ii) No material of any kind shall be loaded on or loaded from the United States piers, except for the use of the United States, unless by special permission of the Captain of the Port.

(iii) Vessels shall take great care not to run into, strike, rub against, or otherwise injure the United States piers, buoys, or beacons in the harbor.

(iv) Dredges and attending scows and tugs are expected and required to give half the channel for passing vessels, and the latter are required to do the same when passing the dredges or other craft.

(v) Where there are two or more channels leading to a given point, in one of which improvement work is going on, the latter channel may be temporarily closed to navigation by the District Commander after due notice.

§ 162.115 Keweenaw Waterway, Mich.; use, administration, and navigation.

(a) Authority. The movement of all vessels, rafts, and floating craft of every description which makes use of this waterway, the approaches thereto, and connecting waters, shall be under the general direction of the District Commander, Ninth Coast Guard District.

(b) Speed of vessels. The speed of vessels of more than 20 tons shall not exceed eight statute miles per hour between Lily Pond and Pilgrim Point.

(c) Towing. Boats engaged in towing shall use towlines of such number, type, and length as will insure full control over their tows at all times and the safe passing of other craft or canal structures and markers.

(d) Channel markers. Masters of vessels shall keep careful watch when passing aids to navigation, and should any be accidentally displaced they shall report this fact to the local United States Coast Guard Station.

(e) Harbors of refuge. Two mooring basins of limited area are located in the waterway, Portage River Harbor of Refuge near the Portage entry, and Lily Pond Harbor of Refuge between Portage Lake and the Upper Entrance. Craft using these harbors are required to make fast to the mooring piers, and except in case of storms or breakdowns shall not use the harbors longer than 24 hours without special permission from the Captain of the Port, Duluth. The position and arrangement of vessels moored in the harbors will be subject to the direction of the Captain of the Port.

(f) Mooring to Government structures. No vessels or craft of any kind shall moor or tie up to any Government structures other than the mooring piers which are provided for the use of vessels at the harbors of refuge.

(g) Damage to Government structures. The regulations in this section shall not affect the liability of the owners and operators of vessels for any damage caused by their operations to break-waters, piers, and revetments. Vessels shall use great care not to strike or injure these structures.

(h) Use of injury of Government property. The occupancy or use of Government structures and of Government lands adjoining the waterway for private business of any kind, storage of property, or residence purposes is prohibited. The injury or defacement of Government buildings, structures, trees, or property of any kind is prohibited.

(i) Obstructing navigation. No person shall willfully or carelessly obstruct or hinder the free navigation of the waterway.

§ 162.120 Harbors on Lake Michigan; speed of vessels.

(a) East shore. The speed of all vessels and other watercraft entering or leaving the harbors of Michigan City, Ind.; St. Joseph, South Haven, Saugatuck, Holland (Lake Macatawa), Grand Haven, Muskegon, White Lake, Pentwater, Ludington, Manistee, Portage Lake (Manistee County), Frankfort, Charlevoix, and Petoskey, Mich., shall be reduced to and shall not exceed a rate of 8 miles per hour.

(b) West shore. The speed of all vessels and other watercraft entering or leaving the harbors of Menominee, Mich. and Wis.; Algoma, Kewaunee, Two Rivers, Manitowoc, Sheboygan, Port Washington, Milwaukee, Racine, and Kenosha, Wis., and Waukegan, Ill., shall be reduced to and shall not exceed a rate of 4 miles per hour.

§ 162.125 Sturgeon Bay and Lake Michigan Ship Canal, Wis., use and navigation.

(a) Supervision. The movement of all boats and floating things in the canal and in the approaches thereto shall be under the direction of the Captain of the Port, Milwaukee.

(b) Signals. On entering the canal at either entrance, steamers or tugs must blow their whistles for 1 minute in order to warn craft approaching from opposite direction and give them time to guard against collisions, by tying up if necessary. All steamers approaching others going in the opposite direction shall slacken speed so as to pass in safety. Compliance is required with rule V of the Inland Rules and the Pilot Rules for Inland Waters.

Rule V. Whenever a steamer is nearing a short bend or curve in the channel where, from the height of the banks or other cause, a steamer approaching from the opposite direction cannot be seen for a distance of half a mile, the pilot of such steamer, when he shall have arrived within half a mile of such curve or bend, shall give a signal by one long blast of the steam whistle, which signal shall be answered by a similar blast by the pilot of any approaching steamer that may be within hearing. Should such signal be so answered by a steamer upon the farther side of

such bend, then the usual signals for the meeting and passing shall immediately be given and answered; but if the first alarm signal of such pilot be not answered, he is to consider the channel clear and govern himself accordingly.

(c) Speed. The rate of speed while passing through the canal shall not exceed 5 miles per hour.

(d) Keeping in the center. The center must be kept all the way through, except in passing other craft. In case of grounding, the rapid or strong working of boat's engines is strictly forbidden.

(e) Draft of boats. No vessel shall enter the canal whose actual draft exceeds the least depth of water in the channel of the canal as given by the Captain of the Port or his authorized representative.

(f) Turning around in canal. Tugs or other steam vessels exceeding 150 feet in length are forbidden to turn around or to attempt to turn around in the canal.

(g) Navigating the canal. All vessels and boats are forbidden: (1) To enter the canal two or more abreast. (2) To pass another while going in the same direction in the canal. (3) To pass the canal in more than one line going each way. (4) To obstruct the canal in any way or to delay, by slow passage through the canal or by any other means, the progress of other vessels. (5) To attempt passing the canal in the face of running ice, except at their own risk and liability to make good any damage to the canal or its banks, which may result from such attempt.

(h) To shorten sail. No vessel, however propelled or being towed, shall pass through the canal with sail or sails up, except sail vessels running with a fair wind. Every craft that sails into or attempts to sail into or through the canal must be responsible for any damage resulting therefrom.

(i) Towing. (1) All boats engaged in towing vessels that are laden, or partially laden, shall use two towlines and shorten them to the greatest extent, so as to have full control of their tows, and thereby avoid accident while meeting or otherwise passing other craft. Boats that are towing vessels without cargo need use but one towline, but the line between the steamer and the first vessel or barge of the tow must not exceed 100 feet in length. Towing more than one craft abreast, or rafts of greater width than 50 feet, is forbidden.

(2) Towing in the same tow of more than one scow or barge of 1,000 tons or more, of a draft not exceeding 10 feet when loaded, whose load is carried on the deck, is hereby prohibited, except upon condition that there shall be two towlines between each vessel in the tow, the lines to be secured to the starboard and port quarters of each craft and to be of a length not to exceed 25 feet in the clear.

(j) Harbor of refuge. The anchoring or mooring of any craft in any part of the canal, except at such place or places as may be directed by the Captain of the Port or his authorized representative, is strictly forbidden. The master of any craft entering into the canal for shelter shall report such fact at once to the Captain of the Port, who will thereupon assign a mooring to such craft. Moorings will usually be assigned at the westerly end of the canal. Under no circumstances shall vessels, other than those on Government business, be permitted to moor or make fast to either of the converging piers or any of the appurtenances thereto, at the Lake Michigan entrance to the canal. Should it become necessary, in the judgment of the Captain of the Port, for a vessel moored in the canal to change it moorings, the vessel shall be promptly moved as may be directed by the Captain of the Port.

(k) Injury to cribs, piers, and sheet piling. Vessels shall use great care not to strike or injure the cribs, piers, sheet piling, or any strutcure pertaining to the canal.

(l) Obstructing navigation. Anyone who shall willfully or through carelessness in any way obstruct the free navigation of the canal, or by the violation of any of the laws or regulations governing the canal and those using it, delay or inconvenience any boat having the right to use the canal, shall be responsible for all damages and delays and for all expenses of removing the obstructions.

NOTE.—The Corps of Engineers also has regulations dealing with this section in 33 CFR Part 207.

§ 162.130 Waukegan Harbor, Ill.

(a) All vessels or other craft are forbidden to lie at anchor in the basin or channel of Waukegan Harbor except for refuge from storms, or in any way to obstruct free navigation of the harbor.

NOTE.—The Corps of Engineers also has regulations dealing with this section in 33 CFR Part 207.

§ 162.135 Connecting waters of the Great Lakes from Lake Huron to Lake Erie; use, administration and navigation.

(a) General—(1) Application and supervision. The regulations in this section shall apply to such of those waters as are within the United States. These waters are under the general supervision of the District Commander, Ninth Coast Guard District.

(2) Local arrangements. The District Commander may make local arrangements with authorized Canadian officials in the interest of safety of operations, to facilitate movement of traffic, to avoid disputes as to jurisdiction and to take necessary action and render assistance in emergencies.

(3) Patrol vessels. The anchorage and movement of all vessels shall be under the direction and subject to the orders of officers in charge of patrol vessels. The following sound signals shall be used by patrol vessels as required:

(i) Three long blasts of a whistle or horn, which signal may also be used by dredges, drill scows, derrick scows, sweep scows, and other floating plant engaged in the maintenance and improvement or investigation of channels, to indicate that the vessel to which it is given is moving at too high a rate of speed; such vessel shall immediately slacken its speed.

(ii) Four long blasts of a whistle or horn, to indicate that the vessel to which the signal is given must stop until further orders are received from the patrol vessel.

(iii) One long blast, followed by four short blasts, of a whistle or horn, to indicate that the vessel to which the

signal is given may proceed on its course. (Radio telephone may be used in lieu of sound signals.)

(4) Other obligations. The regulations in this section shall not be considered to cover all the obligations imposed by law upon vessels and their operators, and shall not be construed as relieving the owners or operators of vessels from any penalties which may be incurred in the violation of the laws, relating to navigation on the Great Lakes and their connecting waters or the regulations issued pursuant to such laws.

(5) Definitions. As used in this section, the terms:

(i) "St. Clair River" shall apply to the connecting waters of the Great Lakes from the Lakeward limits of the improved navigation channels at the foot of Lake Huron to the St. Clair Flats Canal Light 2 at the upper end of Lake St. Clair.

(ii) "Lake St. Clair" shall apply to the channels lying westerly from the International Boundary from the St. Clair Flats Canal Light 2 to Windmill Point Light at the head of the Detroit River.

(iii) "Upper Detroit River" shall apply to that portion of the Detroit River extending from Windmill Point Light to Fighting Island North Light.

(iv) "Lower Detroit River" shall apply to that portion of the river between Fighting Island North Light and the lakeward limits of the improved navigational channels at the head of Lake Erie.

(v) "Patrol Vessel" means a vessel operated by the United States Coast Guard, the Canadian Coast Guard, the Royal Canadian Mounted Police or a harbor master.

(b) Length of towlines. On the connecting waters of the Great Lakes between the Lake Huron Lightship and the southerly limits of the improved channels of the Detroit River, terminating in Lake Erie, the length of towlines shall not exceed by more than 50 feet the length of the scow, barge, vessel, or other craft being towed: Provided, That no scow, barge, vessel or other craft shall be required to have a towline less than 250 feet. The length of the towline shall be measured from the stern of one vessel to the bow of the following vessel.

(c) Routes—(1) St. Clair River in vicinity of Port Huron and Sarnia. Vessels in transit shall pass to right of the black and white vertical striped buoy, situated just above the mouth of the Black River and known as Port Huron Traffic Lighted Buoy. Downbound vessels shall navigate the west or American Channel below Sarnia Elevator Light. Upbound vessels shall navigate the Canadian Channel east of the Port Huron Traffic Lighted Buoy.

NOTE.—Channels east of Stagg Island, east of the St. Clair Middle Ground and the South East Bend Channel below the St. Clair Cut-Off are no longer maintained.

(2) Lower Detroit River south of Livingstone Channel Upper Entrance Light. Downbound vessels shall navigate the Livignstone Channel (west of Bois Blanc Island) except that downbound passenger vessels may use the Amhurstburg Channel (east of Bois Blanc Island) and except as hereinafter provided. All downbound vessels shall enter Lake Erie through the East Outer Channel east of Detroit River Light except those whose draft permits may enter Lake Erie through the West Outer Channel west of Detroit River Light. Upbound vessels shall enter from Lake Erie by way of the East Outer Channel east of Detroit River Light and shall use the Amherstburg Channel, except that under certain conditions during the winter navigation season two-way traffic will be allowed in Livingstone Channel and in the West Outer Channel west of Detroit River Light. The conditions for use of these downbound channels, including the opening and closing dates for two-way traffic, will be established each year by the District Commander.

(3) Vessels exempted. The regulations in this paragraph do not apply to public vessels of the United States, craft employed upon river and harbor improvement work, and vessels under 100 gross tons or vessels making local stops along these routes.

(d) Speed. Commercial vessels (including tug and barge combinations) 65 feet, or greater, in length shall not exceed the following speeds measured in statute miles per hour over the bottom:

(1) In the St. Clair River:

(i) Between Fort Gratiot Light and Stag Island Upper Junction Lighted Buoy, 9 m.p.h. for upbound vessels and 12 m.p.h. for downbound vessels.

(ii) Between Stag Island Upper Junction Lighted Buoy and Harsens Island Rear Range Light, 12 m.p.h. for both upbound and downbound vessels.

(iii) Between Harsens Island Rear Range Light and St. Clair Cut-Off Channel Lt2, F1R, 10 m.p.h. for both upbound and downbound vessels.

(2) In the Detroit River:

(i) Between the black turn buoy (lat. 42°22.0′ N., long. 82°54.0′ W.—Lake St. Clair), and Fighting Island South Light, 12 m.p.h. for upbound vessels and 14 m.p.h. for downbound vessels.

(ii) Between Fighting Island South Light and Detroit River Light 12 m.p.h. for both upbound and downbound vessels.

(3) [Reserved]

(4) In the St. Clair River when the stage of Lake Huron exceeds two (2) feet above International Great Lakes Datum, the District Commander may, if he deems it necessary to protect life and property, including floating plant or shore installations, reduce the allowable maximum speed in all or any part of the river. Temporary speed limits so prescribed shall become effective through publication in a Notice to Mariners and may be modified or likewise rescinded by the District Commander as changing water stages permit or make necessary.

(e) Passing. (1) In the St. Clair River and the Lower Detroit River, any vessel overtaking a tug with a tow moving in the same direction may pass such tow after an exchange of signals indicating on which side the vessel desires to pass, and the pilot of the tug shall haul with the tow to the proper side of the channel to provide passing room.

(2) In the St. Clair River, no vessel of 500 gross tons or over shall pass or attempt to pass another vessel of 500 gross tons or over moving in the same direction within the following limits: (1) Downbound. From the first buoy above Fort Gratiot Light to Port Huron Traffic Lighted

Buoy; and from Walpole Island Upper Light to the St. Clair Flats Canal Light 2.

(ii) Upbound. From the St. Clair Flats Canal Light 2 to Walpole Island Upper Light; and from Port Huron Traffic Lighted Buoy to the first buoy above Fort Gratiot Light.

(3) In the Lower Detroit River between Fighting Island South Light and Bar Point Pier Light 29D, no vessel shall pass or attempt to pass another vessel or vessels moving in either the same or opposite direction when more than two vessels would be abreast.

(4) There shall be a time interval of not less than five (5) minutes between any two vessels entering or navigating the Livingstone Channel between the Upper Enterance Light and Bar Point Pier Light 29D except that tugs without tows and vessels under 100 gross tons are exempted from this rule. This requirement shall not apply under emergency conditions such as might exist when the vessel ahead is proceeding below the speed limits due to engine breakdown or other difficulties, provided the vessel ahead assents to the passing, the overtaking vessel remains within the speed limits, and the passing may be safely undertaken.

(f) Obstruction of traffic. (1) No person shall willfully or carelessly obstruct the free navigation of any of the waterways to which the regulations in this section apply, or delay any vessel having the right to use the waterway.

(2) No vessel shall anchor within the limits of any of the improved channels nor west of the International Boundary Line in the area of the Detroit River between the upstream limits of the Windsor Harbor Anchorage Area north of Fighting Island and the aerial cable across the Detroit River at Fort Wayne except in distress or under stress of weather. Any vessel forced to anchor in this forbidden area shall leave the area as soon as possible.

(3) No vessel of 500 gross tons or over shall anchor in the Detroit River between Belle Isle and Fighting Island so as to have any part of the vessel extended riverward more than 300 feet from shore nor in such position as will interfere with easy movement to and from any dock except in distress or under stress of weather. Vessels unable to comply with this subparagraph and subparagraph (2) of this paragraph shall request anchorage instructions from the U.S. Coast Guard, Belle Isle Lifeboat Station or the Windsor Harbor Master.

(4) Motorboats (as defined by the Motorboat Act of April 25, 1940), sailboats, rowboats, and other small crafts shall not anchor or drift in the regular ship channels except under stress of weather or in case of breakdown. Such craft shall be so operated that they shall not interfere with the safe passage of a vessel which can navigate only inside such channels.

(5) Whenever vessels collect in any of the channels by reasons of fog, smoke, ice, or other obstruction, their anchorage and movement shall be under the direction and control of an officer of the United States Coast Guard or patrol vessel, except as provided in subparagraph (6) of this paragraph. Regular scheduled vessels, carrying passengers or mail may be advanced in order, and any vessel not ready to move when directed to do so many lose its position. The masters of all vessels shall comply promptly with the orders of the patrol vessels.

(6) When, as determined by the District Commander or his authorized representative, there is a stoppage of, interference with or danger to navigation by reasons of the sinking of grounding or unnecessary delay in any channel of any vessel, boat, water craft or raft or other obstruction, he may stop all vessels and direct their anchorage, clear the channel, designate the order in which all vessels shall proceed after the channel is open, and shall do all things deemed necessary to safeguard and expedite the passage of vessels.

(g) Vessels aground or not under command. (1) A vessel over sixty-five feet in length aground or disabled in or near the channel, in addition to displaying the lights or day signals required by Rule 30, of the Rules of the Road —Great Lakes, upon the approach of another vessel bound up or down the channel, shall sound the danger signal of several short and rapid blasts of the whistle, not less than five. If the approaching vessel cannot pass with safety, it shall stop at a safe distance from, and make proper dispositions to avoid fouling the grounded or disabled vessel, and upon the approach of another vessel coming up astern shall repeat the danger signal. Each additional vessel approaching from the same direction shall be similarly warned, in turn, by the vessel preceding. Each vessel shall keep a safe distance from the vessel ahead until the channel has been cleared, and shall pass a grounded or disabled vessel at reduced speed and with caution.

(2) Any vessel passing a stranded or disabled vessel shall report the location and nature of the casualty to the U.S. Coast Guard.

§ 162.140 Rouge River and Short Cut Canal, Mich.; use, administration and navigation.

(a) The following regulations govern the use, administration, and navigation of Rouge River and Short Cut Canal upstream to and including the turning basin upstream of the Dix Avenue Bridge.

(b) Unless otherwise specified, the term "vessel" as used in the regulations in this section shall mean all vessels of 100 or more gross tons and, regardless of tonnage, all tugs with tows.

(c) No vessel shall exceed a speed of 4 miles per hour while navigating in Rouge River or Short Cut Canal.

(d) Vessels are forbidden to enter, or move in, the channel two or more abreast.

(e) No vessel shall pass, or attempt to pass, another vessel moving in the same direction.

(f) All vessels equipped with radio telephone shall thereby broadcast the following security calls:

(1) Within 20 to 30 minutes before entering Rouge River or Short Cut Canal.

(2) Within 20 to 30 minutes before departing any mooring or docking in Rouge River or Short Cut Canal.

(3) Immediately upon leaving Rouge River or Short Cut Canal.

(4) Each 30 minutes when a vessel or any part thereof is lying in the channel for loading, unloading, or other purposes and is in position to obstruct other traffic.

(g) Every vessel, boat, raft, or other floating property which is not underway or anchored in Rouge River shall be securely moored to or made fast to the shore or wharf to avoid its drifting or sliding into the channel or otherwise obstructing navigation.

§ 162.145 Monroe Harbor, Mich.; use, administration, and navigation.

(a) No vessel shall exceed a speed of 6 miles per hour in the river channel nor 10 miles per hour in the lake channel.

(b) No vessel or other craft shall moor or anchor in or along any improved channel or basin in such a manner as to interfere with the improvement or maintenance operations therein. Whenever in the opinion of the District Commander or his authorized representative, any vessel or craft is so moored or anchored, the owner thereof shall cause such vessel or craft to be moved upon notification from, and within the time specified by, said District Commander.

(c) No tow shall enter or pass through the river portion of the channel with a towline more than 200 feet in length.

§ 162.150 Maumee Bay Channel, Ohio; use, administration and navigation.

(a) Definition. The term Bay Channel as used in the regulations of this section means the straight channel in Maumee Bay from the mouth of Maumee River to the lakeward limit of the improved channel connecting with the various sailing courses in Lake Erie. The term River Channel when used in the regulations of this section means the improved navigation channel in the Maumee River from the mouth of the river to the upstream limit of the authorized Toledo Harbor project, about 7 miles upstream from the river mouth. The demarcation between Bay Channel and River Channel as used in the regulations of this section is the lakeward (East) end of the diked island area situated at the north side of the channel opposite the coal-loading docks.

(b) Speed:

(1) Bay channel. Vessels of 500 gross tons or over shall not navigate the straight channel in Maumee Bay at a speed exceeding 12 statute miles per hour over the bottom.

(2) River channel. Vessels of 100 gross tons or over, with or without tows, shall not navigate the channel in Maumee River upstream of the demarcation line at a speed in excess of 6 statute miles per hour over the bottom.

(c) Vessels of 500 gross tons or over, or tugs with tows, shall not navigate the Bay Channel or the River Channel from the mouth upstream to the railroad bridge, located about 2 miles upstream of the mouth of the river, two abreast, except in overtaking situations.

(d) Vessels of 500 gross tons or over, or tugs with tows, shall not overtake or pass another vessel traveling in the same direction in the Bay Channel, or in the River Channel from the mouth upstream to the railroad bridge located about 2 miles upstream of the mouth of the river, where such will result in meeting a vessel or tug with tow navigating in the opposite direction during the overtaking situation.

(e) Vessels of 500 tons or over, or tugs with tow, shall not overtake or pass a vessel traveling in the same direction in the River Channel upstream of the railroad bridge located about 2 miles upstream of the mouth of the river.

(f) No vessel, while moored or at anchor, or by excessive slow passage or otherwise underway, shall unreasonably obstruct the free passage and progress of other vessels.

(g) No vessel shall moor or anchor to any structure of the United States without the consent of the Captain of the Port, Toledo.

§ 162.155 Sandusky Harbor, Ohio.

(a) No vessel shall exceed a speed of 10 miles per hour in Sandusky Harbor.

(b) No vessel shall cross the edges of the channel without reducing its speed sufficiently to avoid displacement of said edges. Vessels crossing said channel shall keep out of the way of vessels navigating the channel.

(c) No vessel shall while moored or at anchor, or by slow passage or otherwise while underway, unreasonably obstruct the free passage and progress of other vessels.

NOTE.—The Corps of Engineers also has regulations dealing with this section in 33 CFR Part 207.

§ 162.160 Vermilion Harbor, Ohio.

(a) No vessel shall exceed a speed of 6 miles per hour.

(b) No vessel shall while moored or at anchor, or by slow passage or otherwise while underway, unreasonably obstruct the free passage and progress of other vessels.

NOTE.—The Corps of Engineers also has regulations dealing with this section in 33 CFR Part 207.

§ 162.165 Harbors of Huron, Lorain, Cleveland, Fairport, Ashtabula, Conneaut, Ohio.

(a) No vessel shall exceed a speed of 6 miles per hour, except in the outer harbors where the maximum speed shall be 10 miles per hour.

(b) No vessel shall while moored or at anchor, or by slow passage or otherwise while underway, unreasonably obstruct the free passage and progress of other vessels.

NOTE.—The Corps of Engineers also has regulations dealing with this section in 33 CFR Part 207.

§ 162.170 Buffalo Harbor, N.Y.

(a) No vessel shall exceed a speed of 6 miles per hour except in the outer harbor where the maximum speed shall be 10 miles per hour.

(b) No vessel shall while moored or at anchor, or by slow passage or otherwise while underway, unreasonably obstruct the free passage and progress of other vessels.

NOTE.—The Corps of Engineers also has regulations dealing with this section in 33 CFR Part 207.

§ 162.175 Black Rock Canal and Lock at Buffalo, N.Y.

(a) No vessel or boat shall navigate the Black Rock Canal at a rate of speed greater than 6 statute miles per hour. This rate of speed will require elapsed time to navigate between designated points as follows:

From North Breakwater Light to Ferry Street Bridge, 26¼ minutes.

From South end of Bird Island Pier to Ferry Street Bridge, 18¾ minutes.

From Ferry Street Bridge to International Bridge, 11½ minutes.

NOTE.—The Corps of Engineers also has regulations dealing with this section in 33 CFR Part 207.

§ 162.180 Niagara River at Niagara Falls, N.Y.; restricted area.

(a) The area. (1) The United States waters of Niagara River downstream of a limit whose true bearing is south 38 degrees west from the downstream (westerly) side of the mouth of Gill Creek to and including the crests of the American and Horseshoe Falls, Niagara Falls, New York. The upstream limiting line of the area if projected to the Canadian shore of Niagara River will intersect the upstream end of the breakwater at the mouth of the Welland River.

(b) The regulations. (1) Navigation by all classes and types of vessels is prohibited in the area except that owners of floating plant engaged in survey and construction may enter the restricted water area provided they apply for and obtain the express consent of the District Commander, Ninth Coast Guard District.

§ 162.185 Rochester (Charlotte) Harbor, N.Y.

(a) No vessel shall exceed a speed of 6 miles per hour in Rochester (Charlotte) Harbor, New York.

(b) No vessel shall while moored or at anchor, or by slow passage or otherwise while underway, unreasonably obstruct the free passage and progress of other vessels.

NOTE.—The Corps of Engineers also has regulations dealing with this section in 33 CFR Part 207.

§ 162.190 St. Lawrence River, Cape Vincent Harbor, N.Y.; navigation of the harbor and United States breakwater.

(a) The term "harbor" when used in this section, applies to all that portion of the St. Lawrence River lying within the following boundaries: Beginning at a point on the harbor face of the breakwater at its easterly end and extending in a straight line along the harbor face of the main part of the breakwater and in extension thereof westerly approximately 2,400 feet; thence at right angles to the above-described line southerly to the northeast corner of the "L" dock at the foot of Market Street, approximately 300 feet; thence easterly along the dock face and shoreline to a point in a line at right angles to the breakwater at its easterly end; and thence along this last described right angle line to the point of beginning.

(b) The navigation of said harbor shall be under the direction of the Captain of the Port, Buffalo.

(c) Vessels shall not exceed a speed of 8 miles per hour in the harbor.

NOTE.—The Corps of Engineers also has regulations dealing with this section in 33 CFR Part 207.

PART 204—DANGER ZONE REGULATIONS

§ 204.175 Lake Michigan; small-arms range adjacent to United States Naval Training Center, Great Lakes, Ill.

(a) *The danger zone.* An area bounded on the north by latitude 42°20′30″; on the east by longitude 87°47′30″; on the south by latitude 42°18′45″; and on the west by the shoreline.

(b) *The regulations.* (1) When firing affecting the danger zone is in progress, the enforcing agency will post guards at such locations that the waters in the danger zone may be observed and arrange signals whereby these guards may stop the firing should any person or vessel be seen in the waters of the danger zone. When firing is in progress, the enforcing agency will cause red flags to be displayed on shore near the rifle butts, and red streamers at other points along the shore which may be readily discernible to a person in a vessel within the danger zone.

(2) The enforcing agency is hereby authorized to use such agencies as shall be necessary to prohibit vessels from entering the area until such time as shall be convenient.

(3) If such streamers are displayed it will indicate that firing is in progress, and that the waters in the danger zone are covered by rifle fire and should not be entered until the flags and streamers are lowered.

(4) Wherever possible, the enforcing agency will warn the public of the contemplated times of firing and the areas involved two days in advance of the scheduled date, through the public press and the United States Coast Guard. The danger zone may, however, be closed without advance notice.

(5) During the firing season two 8-foot drum and cage type buoys painted white with a horizontal orange band and displaying an orange flag marked with "FIRING RANGE" from a 5-foot mast will be moored at the north and south points of the eastern limits of the range.

(6) The regulations in this section shall be enforced by the Commander, United States Naval Training Center, Great Lakes, Illinois, and such agencies as he may designate.

§ 204.180 Waters of Lake Michigan south of Northerly Island at entrance to Burnham Park Yacht Harbor, Chicago, Illinois; danger zone adjacent to airport on Northerly Island.

(a) *Danger Zone*—(1) *Zone A.* Beginning at a point 250 feet west of the center line of the runway at the south end of the air strip on Northerly Island; thence 183°, 500 feet; thence 90°, 600 feet; and thence northerly to a point 250 feet east of the center line of the runway at the south end of said air strip. During the navigation season, the southeast and southwest corners of Zone A will be marked with spar buoys colored and lettered as prescribed by the United States Coast Guard.

(2) *Zone B.* Beginning at the southwest corner of Zone A; thence 183°, 500 feet; thence 90°, 700 feet; thence northerly to the southeast corner of Zone A; and thence 270° to the point of beginning. During the navigation season, the southeast and southwest corners of Zone B will be marked with spar buoys colored and lettered as prescribed by the United States Coast Guard.

(b) *Regulations.* (1) During daylight hours (from one-half hour before sunrise to one-half hour after sunset), and when the airport on Northerly Island is in operation, no vessel or other watercraft any part of which extends more than 15 feet above the water surface shall

enter or remain in Zone A, and no vessel or other watercraft any part of which extends 30 feet or more above the water surface shall enter or remain in Zone B.

(2) When the airport is in operation a red ball, at least three feet in diameter, shall be continuously displayed at the northeast and northwest corners of Zone A. These balls shall not be displayed when the airport is not in operation.

§ 204.187 Lake Erie, west end, north of Erie Ordnance Depot, Lacarne, Ohio.

(a) The danger zone: Consists of the waters of Lake Erie within:

(1) *Danger Area I.* The sector of a circle with a radius of 6,500 yards centered at latitude 41°32′30″ N., longitude 83°01′00″ W., and intersecting the southwest boundary of Area II at latitude 41°35′00″ N., longitude 83°03′22″ W., and the southeast boundary of Area II at latitude 41°34′20″ N., longitude 82°57′10″ W.

(2) *Danger Area II* (Includes Area I). The area bounded as follows: Beginning at latitude 41°32′30″ N., longitude 83°01′00″ W.; thence to latitude 41°35′00″ N., longitude 83°03′22″ W.; thence to latitude 41°36′00″ N., longitude 83°03′24″ W.; thence to latitude 41°41′30″ N., longitude 83°07′30″ W.; thence to latitude 41°41′30″ N., longitude 83°00′00″ W.; thence to latitude 41°35′40″ N., longitude 82°54′50″ W.; and thence to the point of beginning.

(b) Types of firing:

(1) *Danger Area I.* Small arms impact area.

(2) *Danger Area II.* Ground-based artillery, antiaircraft artillery and automatic weapons impact area.

(c) Authorized dates and hours of firing:

(1) *Danger Area I.* 6 a.m. to 6 p.m., e.s.t./e.d.t., daily; actual firing dates and hours within the authorized period to be announced in advance in special firing notices.

(2) *Danger Area II.* 8 a.m. to 5 p.m., e.s.t./e.d.t., daily except on Saturdays, Sundays, and holidays; actual firing dates and hours scheduled within authorized period to be announced in advance in special firing notices.

(d) Restrictions:

(1) No vessel shall enter or remain in a danger area during a scheduled firing period announced in a special firing notice unless specific permission is granted in each instance by a representative of the enforcing officer.

(2) The danger areas within the danger zone shall be open to the public for navigation, fishing and other public use when firing and/or bombing is not scheduled.

(e) Enforcing agencies: The regulations in this section shall be enforced for the respective danger areas by the following commanders and such agencies as each may designate for his assigned areas. He will be responsible for providing the prescribed control, signals, and special firing notices.

(1) *Danger Area I.* Adjutant General, State of Ohio.

(2) *Danger Area II.* Adjutant General, State of Ohio.

(f) Control and signals:

(1) Danger Area I: When firing into Area I, red flags will be flown from the safety tower at Camp Perry, and from flag poles in the butts of the ranges being used.

(2) Danger Area II: During all types of firing into Area II, red flags will be displayed, one from the safety tower at Camp Perry and one from the safety tower at the Erie Proof Front*. During firing into Area II, patrol boats will police and maintain surveillance of the area, and will be in constant radio communication with the shore station controlling the firing.

(3) [Reserved]

(4) The appropriate enforcing officer has authority to suspend any scheduled firing for reasonable periods during regattas and immediately after fishing nets are destroyed or dislocated by severe storms.

(5) The special firing notices which will include schedules of use will be published by the enforcing officer indicated in paragraph (e) of this section, in sufficient time to permit circularization to interested parties and posting on the bulletin boards of post offices in surrounding localities. Special notices will also be furnished the District Engineer, Corps of Engineers, Detroit, Mich.; the Commander, Ninth Coast Guard District, Cleveland, Ohio; the Regional Manager, Federal Aviation Administration, Chicago, Ill.; and each of the enforcing agencies listed in paragraph (e) of this section. Users of the waterway shall familiarize themselves with the current special firing notices. If in doubt, inquiry should be made to the enforcing officer indicated in paragraph (e) of this section.

(6) Agencies desiring to use the areas shall present their requirements to the respective enforcing officer who is responsible for, and is granted authority to, coordinate the firing and established priorities, for the using agencies.

(g) Fishing permits: Fishermen desiring to set fixed nets within the danger zone are required in every instance to have written permits. Permits for placing nets within Areas I and II may be obtained by written application to the Adjutant General, State of Ohio. Applicants for permits must state the location at which they desire to set fixed nets and the period of time which they desire the permit to cover.

(h) Injurious chemicals: No phosphorus or other poisonous chemicals injurious to wild fowl or fish will be discharged into the waters of the areas.

(i) The regulations in this section shall be reviewed annually by the Department of the Army to determine whether further limitations of the danger zone shall be considered.

PART 205—DUMPING GROUNDS REGULATIONS (Revoked and Reserved)

Note: Although the regulations governing Dumping Grounds have been revoked, it does not imply that these areas have been discontinued. Permits must still be obtained from the Environmental Protection Agency (EPA) and/or Corps of Engineers to dump materials into United States waters. (See appendix for addresses of EPA and Corps of Engineers offices.)

The presently charted Dumping Grounds areas will continue to be shown on the nautical charts until such time as they are no longer considered to be a danger to navigation. Mariners are advised to exercise extreme caution in and in the vicinity of the dumping grounds.

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*Corrected to Erie Proving Ground.

PART 206—FISHING AND HUNTING REGULATIONS

§ 206.75 Green Bay, between Menominee and Cedar Rivers, Mich.; fishing.

(a) *Supervision of fishing structures.* General supervision of the location, construction, and manner of maintenance of all fishing structures shall be exercised by the United States District Engineer in charge of the locality in which the structure is placed, whose address is **United States District Engineer, room 428, Federal Building, Milwaukee, Wis.

(b) *Description of fishing limits.* The limits within which fishing structures may be placed are shown on the map entitled "Green Bay Pound Net Fishing Grounds, between Menominee and Cedar Rivers, Mich.", dated March 19, 1925, and bearing United States Engineer Office (Milwaukee, Wis.), file No. 5-Q-3, and E.D. file No. 7223 (Great Lakes)-8/3. No fish-net stakes shall be placed outside these limits, nor within the limits of the regularly established or followed boat routes, nor within 500 feet of any buoy or other aid to navigation placed or maintained by the Bureau of Lighthouses.

(c) *Requirements concerning the placing and maintenance of fish pounds.* (1) A clear passageway at least 200 feet wide shall be maintained, reaching from all regular navigable channels to all established boat landings. All stakes shall project not less than 4 feet above the water surface at all stages of the lake. Any stakes not complying with this condition shall be withdrawn.

(2) The outer end of each net or pound shall be marked plainly by a bush or other suitable day mark, readily discernible.

(3) The name of the owner of each pound shall be displayed in black letters not less than 2 inches in height, upon a white background, from a stake at the outer end of the pound, facing outward, at a height of not less than 10 feet above the water surface at all stages of the lake.

(4) Such lights and signals shall be displayed on each net or pound as provided by § 209.130(q) of this chapter. Each light shall be equal to an 8-inch ship's anchor light, with a capacity to burn 8 days unattended. These lights shall be placed at an elevation not less than 10 feet above the water surface at all stages of the lake. The characteristics of these lights shall be either fixed or flashing, and if flashing, there shall not be less than 75 flashes per minute.

(5) At the end of each fishing season all stakes shall be promptly removed by their owners. Any fishing structure allowed to go into a condition of disrepair so that it cannot be readily seen, or on which the name of the owner is not displayed as specified in this section, or upon which lights and signals are not maintained as required by the Bureau of Lighthouses, if not promptly made to conform to this section in all respects, will be regarded as abandoned, and the owner will be subject to prosecution. Such structures may be summarily removed by the United States District Engineer charged with the general supervision of the locality.

(d) *General restrictions.* (1) Nothing provided in this section shall be interpreted as setting aside exclusively for fisheries any area of navigable water.

(2) This authority does not give any property rights either in real estate or material, or any exclusive privileges; and it does not authorize any injury to private property or invasion of private rights, or any infringement of Federal, State or local laws or regulations, nor does it obviate the necessity of obtaining State assent to the work authorized. (It merely expresses the assent of the Federal Government so far as concerns the public rights of navigation.) (See *Cummings* v. *Chicago*, 188 U.S. 410.)

(3) If at any time in the future it shall be made to appear to the Secretary of the Army that any fishing structure authorized in this section causes unreasonable obstruction to the free navigation of said waters, the owner will be required, upon due notice from the Secretary of the Army, to remove or alter the same so as to render navigation through said water reasonably free, easy, and unobstructed.

§ 206.80 Lake Erie between Marblehead Light, Ohio, and Barcelona, N.Y.; fishing.

(a) *Regulations.* The placing and maintenance of fishing structures in the waters of Lake Erie off the shores of Ohio, Pennsylvania, and New York, between Marblehead Light, Ohio, and Barcelona, New York, will hereafter be governed by the following regulations under provisions of the River and Harbor Act of March 3, 1899, as follows:

(1) Subject to the provisions of this section, the placing and maintenance of fishing structures having been recommended by the Chief of Engineers, is authorized by the Secretary of the Army in the waters of Lake Erie between Marblehead Light, Ohio, and Barcelona, New York, within areas previously approved by the Secretary of the Army as areas within which fishing structures may be permitted: *Provided*, That no such structure shall be erected until a permit therefor, in accordance with the conditions specified in this section shall have been issued by the District Engineer, U.S. Army Engineer District, in charge of the coast and waters within which said structure is located; and the said District Engineer is hereby charged with the duty of supervising the enforcement of the spirit and letter of the law and these regulations.

(2) The permits will be issued for a period of 3 years, and upon application may be renewed to the same permittee for a similar period.

(3) The District Engineer will settle all questions of priority in those localities where no State licenses are issued; but in those States in which licenses are issued, the State will decide the question of priority.

(4) Any person desiring to place and operate fishing structures in the approved areas in the waters of Lake Erie between Marblehead Light, Ohio, and Barcelona, New York, should make application on the form attached hereto, to the *District Engineer, Foot of Bridge St., Buffalo, N.Y. furnishing with the application the written consent of the owner of the shore rights if the inner end of

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**(New address)—U.S. Army Engineer District, Chicago, Corps of Engineers, 219 South Dearborn Street, Chicago, Ill.

the fishing structure is to be placed less than 2,000 feet from shore.

(5) Maps showing approved fishing areas may be examined or purchased for 25 cents each at the *Office of the District Engineer, U.S. Army Engineer District, Buffalo, Foot of Bridge St., Buffalo 7, N.Y.

(6) The applicant must furnish with his application the necessary State license, which will be returned to him by the District Engineer when decision is made concerning the issuance of Federal authority for the structure. The application must show whether the applicant is or has been interested within the preceding 5 years in any fishing structure located in waters of the United States. If so, the location of all such structures must be stated.

(7) No permit will be issued to any applicant until he has removed to the satisfaction of the District Engineer, and under the supervision of an inspector from his office, all piles or other obstructions to navigation for which the applicant is responsible and which are unfit for further use for fishing purposes: *Provided*, That if the structure for which application is made is to be placed on the location of an old structure, serviceable piles left standing on that location need not be removed if the District Engineer consents to their use in the new structure.

(8) The applicant must furnish three copies of a map showing the exact location in which the structure is to be placed. Suitable maps may be purchased for 10 cents each at the *Office of the District Engineer, U.S. Army Engineer District, Buffalo, Foot of Bridge St., Buffalo 7, N.Y.

(b) *Conditions.* Each permit will be governed by the following conditions:

(1) That this authority does not give any property rights either in real estate or material, or any exclusive privileges; and that it does not authorized any injury to private property or invasion of private rights, or any infringement of Federal, State, or local laws or regulations, nor does it obviate the necessity of obtaining State assent to the work authorized. It merely expresses the assent of the Federal Government so far as concerns the public rights of navigation. (See *Cummings* v. *Chicago*, 188 U.S. 410.)

(2) That the work authorized in this section, both construction and maintenance, shall be subject to the supervision and approval of, and all apparatus subject to inspection by, the District Engineer, Engineer Department at Large, in charge of the locality, who is charged with the duty of supervising the enforcement of the law and regulations, and who may temporarily suspend any or all classes of the work at any time if, in his judgment, the interests of navigation so require.

(3) That the structure must be constructed strictly on the location indicated on the following map and forming a part of this permit.

(4) That on the outer or lakeward end of the structure the permittee shall maintain a board at least 1 foot high and 3 feet long on which shall be indicated by black lettering not less than 4 inches high, on white background, the United States number or other identification mark assigned to the structure by the District Engineer, and in lettering 2 inches high the name and address of the owner.

(5) That the permittee shall report to the District Engineer all changes in the number of State or municipal licenses, and shall forward such licenses for inspection by the District Engineer. They will be duly returned to the permittee.

(6) That the fishing structure shall be removed within 30 days after the expiration of this permit, at the expense of the permittee and to the satisfaction of the District Engineer, unless a new permit therefor shall have been issued. If the permittee wishes to cease using the pound, he shall at once remove it as prescribed in subparagraph (8) of this paragraph.

(7) That if future operations by the United States require an alteration in the position of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army, it shall cause unreasonable obstruction to the free navigation of the said waters, the permittee will be required, upon due notice from the Secretary of the Army, to remove or alter the structure or work, or obstructions caused thereby, without expense to the United States, so as to render navigation reasonably free, easy, and unobstructed. No claim shall be made against the United States on account of such removals or alterations.

(8) That if the permittee wishes to alter or remove the structure under other circumstances, he shall give notice in writing to the District Engineer at least 10 days before commencing the proposed work, stating the day upon which he wishes to begin. In all cases the work of removal or alterations shall be performed in a manner satisfactory to, and approved by, the District Engineer, and no piles shall be removed at any time except in the presence of an inspector from his office.

(9) That fishing structures and appliances in navigable waters of the United States shall be lighted for the safety of navigation, as provided by § 209.130(q) of this chapter.

Each light shall be equal to an 8-inch ship's anchor light, with a capacity to burn 8 days unattended. These lights shall be placed at an elevation not less than 10 feet above the plane of mean high water. All lights shall be subject to the inspection of the said District Engineer before use. The permittee will be responsible for keeping the lanterns in first-class condition, and for the proper maintenance of the lights between the hours above prescribed during the navigation season.

(10) That there shall be installed and maintained on the weir, trap, or pound by and at the expense of the permittee, such additional lights and signals as may be prescribed by the Bureau of Lighthouses†. Department of Commerce, and that provision shall be made by watchman or otherwise for proper attendance of lights and signals, so that they will at all times be in effective condition.

(11) That if inspections or any other operations by the United States are necessary in the interests of naviga-

*(New address)—U.S. Army Engineer District, Buffalo, Corps of Engineers, 1776 Niagara St., Buffalo, N.Y. 14207.

†Transferred to U.S. Coast Guard in 1939.

tion, all expenses connected therewith shall be borne by the permittee.

(12) That the permittee shall notify the said District Engineer at what time the work will be commenced, and as far in advance of the time of commencement as the said District Engineer may specify and shall also notify him promptly, in writing, of the commencement of work, suspension of work (if for a period of more than one week), resumption of work, and its completion.

(13) That the permittee shall report to the said District Engineer any change in or abandonment of location of fishing structures or appliances. This permit is not transferable.

(14) That within 10 days after the issuance of this authorization, the permittee shall deposit with the said District Engineer a bond in the penal sum of $500 for each structure hereby authorized, conditioned to insure compliance with all conditions of the permit. No work of construction shall be commenced under this authority until after such bond shall have been delivered to and accepted by the said District Engineer at Buffalo, N.Y.

(15) Failure to observe any of the conditions herein set forth shall be considered sufficient ground for the summary removal of the structure by the United States at the expense of the permittee or bondsman and for his prosecution under the provisions of sections 10 and 12 of the River and Harbor Act, approved March 3, 1899 (30 Stat. 1151; 33 U.S.C. 403, 406), for maintaining illegal structures and endangering navigation. No claim shall be made against the United States on account of any such alteration or removal.

(16) That this authority is revocable at will by the Secretary of the Army and, unless previously revoked by him shall cease and be null and void after the date of termination specified in the permit.

APPLICATION

_____

_____, 19__

THE DISTRICT ENGINEER,

**Foot of Bridge St., Buffalo, 7, N.Y.*

SIR: Subject to the foregoing, _____
(We or I)
hereby request permission to construct a _____ in Lake Erie, in Area _____ of the Buffalo, N.Y., district, and to maintain it until December 31, ____. Length over all _____ feet, with its outer end terminating at a point _____ feet offshore, its inner end _____ feet offshore, and _____ miles from _____ as shown on attached map.

State license No. _____ is submitted herewith for your inspection; to be returned. I have _____ been interested in other fishing structures in the waters of the United States within the past five years, as follows:

_____

_____

_____

Name _____ Address _____

PERMIT

DEPARTMENT OF THE ARMY, U.S. ARMY
ENGINEER DISTRICT, CORPS OF ENGINEERS

_____, 19__

Referring to written request dated _____, addressed to _____

I have to inform you that, upon recommendation of the Chief of Engineers and under the provisions of section 10 of the act of Congress approved March 3, 1899, entitled "An act making appropriations for the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes," and subject to the conditions hereon, you are hereby authorized by the Secretary of the Army:

To erect and maintain _____ in Lake Erie, in Area _____ of the authorized _____ Fishing Areas in the Buffalo, N.Y., District, at the location shown on the map attached hereto. The said _____ shall be designated as No. _____.

This authority shall cease and be null and void on _____ unless previously revoked or renewed.

By authority of the Secretary of the Army:

_____

_____ *Corps of Engineers,*
District Engineer.

PART 207—NAVIGATION REGULATIONS

§ 207.50 Hudson River Lock at Troy, N.Y.; navigation.

(a) *Authority of lockmaster.* The lockmaster shall be charged with the immediate control and management of the lock, and of the area set aside as the lock area, including the lock approach channels. He shall see that all laws, rules and regulations for the use of the lock and lock area are duly complied with, to which end he is authorized to give all necessary orders and directions in accordance therewith, both to employees of the Government and to any and every person within the limits of the lock or lock area, whether navigating the lock or not. No one shall cause any movement of any vessel, boat, or other floating thing in the lock or approaches except by or under the direction of the lockmaster or his assistants.

(b) Signals.—Steamboats or tows desiring lockage in either direction shall give notice to the locktenders, when not more than three-fourths mile from the lock, by one long blast (of 10 seconds' duration), followed by one short blast (of three seconds' duration), of a whistle or horn. When the lock is ready for entrance a green light will be shown from the river wall. An amber light will

*(New address)—U.S. Army Engineer District, Buffalo, Corps of Engineers, 1776 Niagara St., Buffalo, N.Y. 14207.

indicate that the lock is being made ready for entrance. A red light will indicate that the approaching vessel must wait. Whenever local conditions make it advisable, the visual signals will be supplemented by sound signals as follows:

(1) One long blast of a horn to indicate that the vessel must wait.

(2) One short blast of a horn to indicate that the lock is being made ready for entrance.

(3) Two short blasts of a horn to indicate permission to enter the lock.

(4) Four short and rapid blasts to attract attention, indicate caution, and signal danger.

* * * * *

(d) *Precedence at the lock.* The vessel arriving first at the lock shall be first to lock through; but precedence shall be given to vessels belonging to the United States and to commercial vessels in the order named. Arrival posts or markers may be established ashore above or below the lock. Vessels arriving at or opposite such posts or markers will be considered as having arrived at the lock within the meaning of this paragraph. If the traffic is crowded in both directions, up and down lockages will usually be made alternately, but the locktender may permit two or more lockages to be made at one time in the same direction when this will not cause unreasonable delay. In case two or more boats or tows are to enter for the same lockage, they shall enter as directed by the locktender. No boat shall run ahead of another while in the lock. The boat that enters first shall leave first.

(e) *Lockage of pleasure boats.* The lockage of pleasure boats, house boats or like craft shall be expedited by locking them through with commercial craft (other than barges carrying gasoline or highly hazardous materials) in order to utilize the capacity of the lock to its maximum. Lockage of pleasure craft may be made with commercial craft carrying petroleum products other than gasoline, provided a clear distance of at least 100 feet between such vessels can be maintained in the lock. If, after the arrival of such craft, no separate or combined lockage can be accomplished within a reasonable time, not to exceed the time required for three other lockages, then separate lockage shall be made.

* * * * *

(o) **Penalties.**—In addition to the penalties prescribed by law, boats which fail to comply with the regulations in this section will thereafter be refused lockage until assurances have been received, satisfactory to the District Engineer, Corps of Engineers, New York, N.Y., that the regulations will be complied with.

§ 207.300 Ohio River, Mississippi River above Cairo, Ill.; and their tributaries; use, administration, and navigation.

(a) *Authority of lockmasters.* The lockmaster shall be charged with the immediate control and management of the lock, and of the area set aside as the lock area, including the lock approach channels. He shall see that all laws, rules and regulations for the use of the lock and lock area are duly complied with, to which end he is authorized to give all necessary orders and directions in accordance therewith, both to employees of the Government and to any and every person within the limits of the lock or lock area, whether navigating the lock or not. No one shall cause any movement of any vessel, boat, or other floating thing in the lock or approaches except by or under the direction of the lockmaster or his assistants. In the event of an emergency, the lockmaster may depart from these regulations as he deems necessary. The lockmasters shall also be charged with the control and management of Federally constructed mooring facilities.

(b) *Safety rules for vessels using navigation locks.* The following safety rules are hereby prescribed for vessels in the locking process, including the act of approaching or departing a lock:

(1) *Tows with flammable or hazardous cargo barges, loaded or empty.* (i) Stripping barges or transferring cargo is prohibited.

(ii) All hatches on barges used to transport flammable or hazardous materials shall be closed and latched, except those barges carrying a gas-free certificate.

(iii) Spark-proof protective rubbing fenders ("possums") shall be used.

(2) *All vessels.* (i) Leaking vessels may be excluded from locks until they have been repaired to the satisfaction of the lockmaster.

(ii) Smoking, open flames, and chipping or other spark-producing activities are prohibited on deck during the locking cycle.

(iii) Painting will not be permitted in the lock chamber during the locking cycle.

(iv) Tow speeds shall be reduced to a rate of travel such that the tow can be stopped by checking should mechanical difficulties develop. Pilots should check with the individual lockmasters concerning prevailing conditions. It is also recommended that pilots check their ability to reverse their engines prior to beginning an approach, Engines shall not be turned off in the lock until the tow has stopped and been made fast.

(v) U.S. Coast Guard regulations require all vessels to have on board life saving devices for prevention of drowning. All crew members of vessels required to carry work vests (life jackets) shall wear them during a lockage, except those persons in an area enclosed with a handrail or other device which would reasonably preclude the possibility of falling overboard. All deckhands handling lines during locking procedure shall wear a life jacket. Vessels not required by Coast Guard regulations to have work vests aboard shall have at least the prescribed life saving devices, located for ready access and use if needed. The lockmaster may refuse lockage to any vessel which fails to conform to the above.

(c) *Reporting of navigation incidents.* In furtherance of increased safety on waterways the following safety rules are hereby prescribed for all navigation interests:

(1) Any incident resulting in uncontrolled barges shall immediately be reported to the nearest lock. The report shall include information as to the number of loose barges, their cargo, and the time and location where they broke loose. The lockmaster or locks shall be kept informed of

the progress being made in bringing the barges under control so that he can initiate whatever actions may be warranted.

(2) Whenever barges are temporarily moored at other than commercial terminals or established fleeting areas, and their breaking away could endanger a lock, the nearest lock shall be so notified, preferably the downstream lock.

(3) Sunken or sinking barges shall be reported to the nearest lock both downstream and upstream of the location in order that other traffic passing those points may be advised of the hazards.

(4) In the event of an oil spill, notify the nearest lock downstream, specifying the time and location of the incident, type of oil, amount of spill, and what recovery or controlling measures are being employed.

(5) Any other activity on the waterways that could conceivably endanger navigation or a navigation structure shall be reported to the nearest lock.

(6) Whenever it is necessary to report an incident involving uncontrolled, sunken or sinking barges, the cargo in the barges shall be accurately identified.

(d) *Precedence at locks.* (1) The vessel arriving first at a lock shall normally be first to lock through, but precedence shall be given to vessels belonging to the United States. Licensed commercial passenger vessels operating on a published schedule or regularly operating in the "for hire" trade shall have precedence over cargo tows and like craft. Commercial cargo tows shall have precedence over recreational craft, except as described in paragraph (f).

(2) Arrival posts or markers may be established ashore above and/or below the locks. Vessels arriving at or opposite such posts or markers will be considered as having arrived at the locks within the meaning of this paragraph. Precedence may be established visually or by radio communication. The lockmaster may prescribe such departure from the normal order of precedence as in his judgment is warranted to achieve best lock utilization.

(e) *Unnecessary delay at locks.* Masters and pilots must use every precaution to prevent unnecessary delay in entering or leaving locks. Vessels failing to enter locks with reasonable promptness when signalled to do so shall lose their turn. Rearranging or switching of barges in the locks or in approaches is prohibited unless approved or directed by the lockmaster. This is not meant to curtail "jackknifing" or set-overs where normally practiced.

(f) *Lockage of recreational craft.* In order to fully utilize the capacity of the lock, the lockage of recreational craft shall be expedited by locking them through with commercial craft, *provided that both parties agree to joint use of the chamber.* When recreational craft are locked simultaneously with commercial tows, the lockmaster will direct, whenever practicable, that the recreational craft enter the lock and depart while the tow is secured in the lock. Recreational craft will not be locked through with vessels carrying volatile cargoes or other substances likely to emit toxic or explosive vapors. If the lockage of recreation craft cannot be accomplished within the time required for three other lockages, a separate lockage of recreational craft shall be made. Recreational craft operators are advised that many locks have a pull chain located at each end of the lock which signals the lockmaster that lockage is desired. Furthermore, many Mississippi River locks utilize a strobe light at the lock to signal recreational type vessels that the lock is ready for entry. Such lights are used exclusively to signal recreational craft.

(g) *Simultaneous lockage of tows with dangerous cargoes.* Simultaneous lockage of other tows with tows carrying dangerous cargoes or containing flammable vapors normally will only be permitted when there is agreement between the lockmaster and both vessel masters that the simultaneous lockage can be executed safely. He shall make a separate decision each time such action seems safe and appropriate, provided:

(1) The first vessel or tow in and the last vessel or tow out are secured before the other enters or leaves.

(2) Any vessel or tow carrying dangerous cargoes is not leaking.

(3) All masters involved have agreed to the joint use of the lock chamber.

(h) *Stations while awaiting a lockage.* Vessels awaiting their turn to lock shall remain sufficiently clear of the structure to allow unobstructed departure for the vessel leaving the lock. However, to the extent practicable under the prevailing conditions, vessels and tows shall position themselves so as to minimize approach time when signaled to do so.

(i) *Stations while awaiting access through navigable pass.* When navigable dams are up or are in the process of being raised or lowered, vessels desiring to use the pass shall wait outside the limits of the approach points unless authorized otherwise by the lockmaster.

(j) *Signals.* Signals from vessels shall ordinarily be by whistle; signals from locks to vessels shall be by whistle, another sound device, or visual means, when a whistle is used, long blasts of the whistle shall not exceed 10 seconds and short blasts of the whistle shall not exceed 3 seconds. Where a lock is not provided with a sound or visual signal installation, the lockmaster will indicate by voice or by the wave of a hand when the vessel may enter or leave the lock. Vessels must approach the locks with caution and shall not enter nor leave the lock until signaled to do so by the lockmaster. The following lockage signals are prescribed:

(1) *Sound signals by means of a whistle.* These signals apply at either a single lock or twin locks.

(i) Vessels desiring lockage shall on approaching a lock give the following signals at a distance of not more than one mile from the lock;

(*a*) If a single lockage only is required: One long blast of the whistle followed by one short blast.

(*b*) If a double lockage is required: One long blast of the whistle followed by two short blasts.

(ii) When the lock is ready for entrance, the lock will give the following signals:

(*a*) One long blast of the whistle indicates permission to enter the lock chamber in the case of a single lock or to enter the landward chamber in the case of twin locks.

(*b*) Two long blasts of the whistle indicates permission to enter the riverward chamber in the case of twin locks.

(iii) Permission to leave the locks will be indicated by the following signals given by the lock:

(*a*) One short blast of the whistle indicates permission to leave the lock chamber in the case of a single lock or to leave the landward chamber in the case of twin locks.

(*b*) Two short blasts of the whistle indicates permission to leave the riverward chamber in the case of twin locks.

(iv) Four or more short blasts of the lock whistle delivered in rapid succession will be used as a means of attracting attention, to indicate caution, and to signal danger. This signal will be used to attract the attention of the captain and crews of vessels using or approaching the lock or navigating in its vicinity and to indicate that something unusual involving danger or requiring special caution is happening or is about to take place. When this signal is given by the lock, the captains and crews of vessels in the vicinity shall immediately become on the alert to determine the reason for the signal and shall take the necessary steps to cope with the situation.

(2) *Lock signal lights.* At locks where density of traffic or other local conditions make it advisable, the sound signals from the lock will be supplemented by signal lights. Flashing lights (showing a one-second flash followed by a two-second eclipse) will be located on or near each end of the land wall to control use of a single lock or of the landward lock of double locks. In addition, at double locks, interrupted flashing lights (showing a one-second flash, a one-second eclipse and a one-second flash, followed by a three-second eclipse) will be located on or near each end of the intermediate wall to control use of the riverward lock. Navigation will be governed as follows:

(i) *Red light.* Lock cannot be made ready immediately. Vessel shall stand clear.

(ii) *Amber light.* Lock is being made ready. Vessel may approach but under full control.

(iii) *Green light.* Lock is ready for entrance.

(iv) *Green and Amber.* Lock is ready for entrance but gates cannot be recessed completely. Vessel may enter under full control and with extreme caution.

(3) *Radio Communications.* VHF–FM radios, operating in the FCC authorized Maritime Band, have been installed at all operational locks (except those on the Kentucky River and Lock 3, Green River). Radio contact may be made by any vessel desiring passage. Commercial tows are especially requested to make contact at least one half hour before arrival in order that the pilot may be informed of current river and traffic conditions that may affect the same passage of his tow.

(4) All locks monitor 156.8 MHz (Ch. 16) and 156.65 MHz (Ch. 13) and can work 156.65 MHz (Ch. 13) and 156.7 MHz (Ch. 14) Ch. 16 is the authorized call, reply and distress frequency, and locks are not permitted to work on this frequency except in an emergency involving the risk of immediate loss of life or property. Vessels may call and work Ch. 13, without switching but are cautioned that vessel to lock traffic must not interrupt or delay Bridge to Bridge traffic which has priority at all times.

(k) *Rafts.* Rafts to be locked through shall be moored in such manner as not to obstruct the entrance of the lock, and if to be locked in sections, shall be brought to the lock as directed by the lockmaster. After passing the lock the sections shall be reassembled at such distance beyond the lock as not to interfere with other vessels.

(l) *Entrance to and Exit from Locks.* In case two or more boats or tows are to enter for the same lockage, their order of entry shall be determined by the lockmaster. Except as directed by the lockmaster, no boat shall pass another in the lock. In no case will boats be permitted to enter or leave the locks until directed to do so by the lockmaster. The sides of all craft passing through any lock shall be free from projections of any kind which might injure the lock walls. All vessels shall be provided with suitable fenders, and shall be used to protect the lock and guide walls until it has cleared the lock and guide walls.

(m) *Mooring.* (1) *At locks.* (i) All vessels when in the locks shall be moored as directed by the lockmaster. Vessels shall be moored with bow and stern lines leading in opposite directions to prevent the vessel from "running" in the lock. All vessels will have one additional line available on the head of the tow for emergency use. The pilothouse shall be attended by qualified personnel during the entire locking procedure. When the vessel is securely moored, the pilot shall not cause movement of the propellers except in emergency or unless directed by the lockmaster. Tying to lock ladders is strictly prohibited.

(ii) Mooring of unattended or nonpropelled vessels or small craft at the upper or lower channel approaches will not be permitted within 1200 feet of the lock.

(2) *Outside of locks.* (i) No vessel or other craft shall regularly or permanently moor in any reach of a navigation channel. The approximate centerline of such channels are marked as the sailing line on Corps of Engineers' navigation charts. Nor shall any floating craft, except in an emergency, moor in any narrow or hazardous section of the waterway. Furthermore, all vessels or other craft are prohibited from regularly or permanently mooring in any section of navigable waterways which are congested with commercial facilities or traffic unless it is moored at facilities approved by the Secretary of the Army or his authorized representative. The limits of the congested areas shall be marked on Corps of Engineers' navigation charts. However, the District Engineer may authorize in writing exceptions to any of the above if, in his judgment, such mooring would not adversely affect navigation and anchorage.

(ii) No vessel or other craft shall be moored to railroad tracks, to riverbanks in the vicinity of railroad tracks when such mooring threatens the safety of equipment using such tracks, to telephone poles or power poles, or to bridges or similar structures used by the public.

(iii) Except in case of great emergency, no vessel or craft shall anchor over revetted banks of the river, and no floating plant other than launches and similar small craft shall land against banks protected by revetment except at regular commercial landings. In all cases, every

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precaution to avoid damage to the revetment works shall be exercised. The construction of log rafts along mattressed or paved banks or the tying up and landing of log rafts against such banks shall be performed in such a manner as to cause no damage to the mattress work or bank paving. Generally, mattress work extends out into the river 600 feet from the low water line.

(iv) Any vessel utilizing a federally constructed mooring facility (e.g., cells, buoys, anchor rings) at the points designated on the current issue of the Corps' navigation charts shall advise the lockmaster at the nearest lock from that point by the most expeditious means.

(n) *Draft of vessels.* No vessel shall attempt to enter a lock unless its draft is at least three inches less than the least depth of water over the guard sills, or over the gate sills if there be no guard sills. Information concerning controlling depth over sills can be obtained from the lockmaster at each lock or by inquiry at the office of the district engineer of the district in which the lock is located.

(o) *Handling machinery.* No one but employees of the United States shall move any lock machinery except as directed by the lockmaster. Tampering or meddling with the machinery or other parts of the lock is strictly forbidden.

(p) *Refuse in locks.* Placing or discharging refuse of any description into the lock, on lock walls or esplanade, canal or canal bank is prohibited.

(q) *Damage to locks or other work.* To avoid damage to plant and structures connected with the construction or repair of locks and dams, vessels passing structures in the process of construction or repair shall reduce their speed and navigate with special caution while in the vicinity of such work. The restrictions and admonitions contained in these regulations shall not affect the liability of the owners and operators of floating craft for any damage to locks or other structures caused by the operation of such craft.

(r) *Trespass of lock property.* Trespass on locks or dams or other United States property pertaining to the locks or dams is strictly prohibited except in those areas specifically permitted. Parties committing any injury to the locks or dams or to any part thereof will be responsible therefor. Any person committing a willful injury to any United States property will be prosecuted. No fishing will be permitted from lock walls, guide walls, or guard walls of any lock or from any dam, except in areas designated and posted by the responsible District Engineer as fishing areas, Personnel from commercial and recreational craft will be allowed on the lock structure for legitimate business reasons; e.g., crew changes, emergency phone calls, etc.

(s) *Restricted areas at locks and dams.* All waters immediately above and below each dam, as posted by the respective District Engineers, are hereby designated as restricted areas. No vessel or other floating craft shall enter any such restricted area at any time. The limits of the restricted areas at each dam will be determined by the responsible District Engineer and market by signs and/or flashing red lights installed in conspicuous and appropriate places.

(t) *Statistical information.* (1) Masters of vessels shall furnish to the lockmaster such statistics of passengers or cargo as may be requested.

(2) The owners or masters of vessels sunk in the navigable waters of the United States shall provide the appropriate District Engineer with a copy of the sunken vessel report furnished to the U.S. Coast Guard Marine Inspection Office in accordance with Code of Federal Regulations Title 33 Subpart 64.10–1.

(u) *Operations during high water and floods in designated vulnerable areas.* Vessels operating on these waters during periods when river stages exceed the level of "ordinary high water," as designated on Corps of Engineers' navigation charts, shall exercise reasonable care to minimize the effects of their bow waves and propeller washes on river banks; submerged or partially submerged structures or habitations; terrestrial growth such as trees and bushes; and man-made amenities that may be present. Vessels shall operate carefully when passing close to levees and other flood protection works, and shall observe minimum distaces from banks which may be prescribed from time to time in Notices to Navigation Interests. Pilots should exercise particular care not to direct propeller wash at river banks, levees, revetments, structures or other appurtenances subject to damage from wave action.

(v) *Navigation lights for use at all locks and dams except on the Kentucky River and Lock 3, Green River.* (1) At locks at all fixed dams and at locks at all movable dams when the dams are up so that there is no navigable pass through the dam, the following navigation lights will be displayed during hours of darkness:

(i) Three green lights visible through an arc of 360° arranged in a vertical line on the upstream end of the river (guard) wall unless the intermediate wall extends farther upstream. In the latter case, the lights will be placed on the upstream end of the intermediate wall.

(ii) Two green lights visible through an arc of 360° arranged in a vertical line on the downstream end of the river (guard) wall unless the intermediate wall extends farther downstream. In the latter case, the lights will be placed on the downstream end of the intermediate wall.

(iii) A single red light, visible through an arc of 360° on each end (upstream and downstream) of the land (guide) wall.

(2) At movable dams when the dam has been lowered or partly lowered so that there is an unobstructed navigable pass through the dam, the navigation lights indicated in the following paragraphs will be displayed during hours of darkness until lock walls and weir piers are awash.

(i) Three red lights visible through an arc of 360° arranged in a vertical line on the upstream end of the river (guard) wall.

(ii) Two red lights visible through an arc of 360° arranged in a vertical line on the downstream end of the river (guard) wall.

(iii) A single red light visible through an arc of 360° on each end (upstream and downstream) of the land (guide) wall.

(3) After lock walls and weir piers are awash they will be marked as prescribed in paragraph (x) below.

(4) If one or more bear traps or weirs are open or partially open, and may cause a set in current conditions at the upper approach to the locks, this fact will be indicated by displaying a white circular disk 5 feet in diameter, on or near the light support on the upstream end of the land (guide) wall during the hours of daylight, and will be indicated during hours of darkness by displaying a white (amber) light vertically under and 5 feet below the red light on the upstream end of the land (guide) wall.

(5) At Locks No. 1 and 2, Green River, when the locks are not in operation because of high river stages, a single red light visible through an arc of 360° will be displayed on each end (upstream and downstream) of the lock river (guard) will at which time the lights referred to above will not be visible.

(w) *Navigation lights for use at locks and dams on the Kentucky River and Lock 3, Green River.* A single red light visible through an arc of 360° shall be displayed during hours of darkness at each end of the river wall or extending guard structures until these structures are awash.

(x) *Buoys at movable dams.* (1) Whenever the river (guard) wall of the lock and any portion of the dam are awash, and until covered by a depth of water equal to the project depth, the limits of the navigable pass through the dam will be marked by buoys located at the upstream and downstream ends of the river (guard) wall, and by a single buoy over the end or ends of the portion or portions of the dam adjacent to the navigable pass over which project depth is not available. A red nun-type buoy will be used for such structures located on the left-hand side (facing downstream) of the river and a black can-type buoy for such structures located on the right-hand side. Buoys will be lighted, if practicable.

(2) Where powerhouses or other substantial structures projecting considerably above the level of the lock wall are located on the river (guard) wall, a single red light located on top of one of these structures may be used instead of river wall buoys prescribed above until these structures are awash, after which they will be marked by a buoy of appropriate type and color (red nun or black can buoy) until covered by a depth of water equal to the project depth. Buoys will be lighted, if practicable.

(y) *Vessels to carry regulations.* A copy of these regulations shall be kept at all times on board each vessel regularly engaged in navigating the rivers to which these regulations apply. Copies may be obtained from any lock office or District Engineer's office on request. Masters of such vessels are encouraged to have on board copies of the current edition of appropriate navigation charts.

NOTES

1. Muskingum River Lock & Dam 1 has been removed. Ohio River slackwater provides navigable channel for recreational craft to Lock 2 near Devola, Ohio. Muskingum River Locks 2 thru 11 inclusive have been transferred to the State of Ohio and are operated during the recreational boating season by the Ohio Department of Natural Resources. Inquiries regarding Muskingum River channel conditions and lock availability should be directed to the aforementioned Department.

2. Little Kanawha River Lock and Dam 1 has been removed, thus permitting recreational craft to navigate up to Lock 2 near Slate. W. Va. Operation of Locks 2 thru 5 on the Little Kanawha River has been discontinued.

3. Big Sandy River: Lock 1 has been removed, thus permitting recreational craft to navigate to Lock 2, near Buchanan, Ky. Operation of Lock 2 and Lock 3 near Fort Gay, W. Va. has been discontinued. Operation of Lock and Dam 1 on Levisa Fork near Gallup, Ky., and Lock and Dam 1 on Tug Fork near Chapman, Ky. has been discontinued.

4. Operation of the following Green River Locks has been discontinued: Lock 4 near Woodbury, Ky., Lock 5 near Glenmore, Ky., and Lock 6 near Brownsville, Ky.

5. Operation of Barren River Lock and Dam No. 1 near Richardsville, Ky. has been discontinued.

6. Operation of Rough River Lock and Dam No. 1 near Hartford, Ky. has been discontinued.

7. Operation of Osage River Lock and Dam 1 near Osage City, Mo., has been discontinued.

8. Operation of the 34 locks in the Illinois and Mississippi (Hennepin) Canal, including the feeder section, has been discontinued.

9. Operation of the Illinois and Michigan Canal has been discontinued.

§ 207.390 The Great Lakes; waterborne commerce statistics.

(a) Owners, agents, masters, and clerks of vessels and other craft plying the Great Lakes and individuals and corporations engaging in transporting their goods upon the Great Lakes, shall hereafter furnish statements relative to vessels, passengers, freight, and tonnage in the manner and at such times as prescribed in this section.

(1) Vessels operated on the Great Lakes are classified according to the nature of their operations, and movements of those in each class will be reported upon on forms furnished by the Corps of Engineers, Department of the Army, as follows:

(i) *Class 1.* Vessels operating as contract or private carriers, or combinations of these, except those engaged in fishing, sand and gravel dredging, railroad car ferrying, general and automobile ferrying, and common carrier package freighting and/or passenger carrying, shall be reported, upon or shortly after their arrival at any port or locality, whether carrying cargoes or moving light or in ballast. Each movement will be numbered beginning with No. 1 in each calendar year.

(*a*) Traffic Form 1 (post card) will be used when a vessel of Class 1 moves from one port or locality to another port or locality, and carries but one commodity, or is light or ballasted.

(*b*) Traffic Form 2 (sheet form) will be used when a vessel of Class 1 loads a unit or mixed cargo at several

ports or localities, and discharges the same at one or more ports or localities. Reports must be made so that the movement of each commodity between ports can be traced. These reports will be mailed in the envelopes provided therefor.

(ii) *Class 2.* This includes vessels operating as common carriers in regularly established freight and/or passenger traffic between specified ports. Reports will be made on Traffic Form 3, monthly or at other periods, as per arrangements made with the U.S. District Engineer office in whose district the operating headquarters of the transportation line making such report is located.

(iii) *Class 3.* This includes vessels engaged in fishing on the Great Lakes or tributary waters, the dredging and the movement of sand and gravel, railroad car ferrying, and general and automobile ferrying. Reports on the movements and business done by this class of carrier will be made as required by the several District Engineer offices on the Great Lakes.

(b) In case any owner or operator of a vessel or vessels has not been contacted with respect to reporting his activities, any one of the Enigneer offices listed below should be notified:

Buffalo, N.Y.
Detroit, Mich.
St. Paul, Minn.
Chicago, Ill.
or The Division Engineer, U.S. Army Engineer Division, North Central, 536 South Clark Street, Chicago 5, Illinois.

NOTE:

1. To comply with the above cited law, reports of operations for each vessel of United States registry operated in commerce on the Great Lakes and its tributaries are required to be submitted to the District Engineer, Chicago District, Corps of Engineers, ATTN: Operations Division—Statistics, 219 S. Dearborn Street, Chicago, Ill., 60604. The report is to reflect each complete one-way movement, or trip, and is to be submitted monthly, preferably by the operating headquarters of the vessel company not later than 15 days beyond the close of the month reported. These "Trips" should be numbered consecutively beginning with the first arrival date of a calendar year, whether carrying cargo or moving light or in ballast.

2. The reports are usually to be submitted on ENG 3925 for deep draft vessels, ENG 3925–B for inland water craft, or on optional ENG 3925–D and ENG 3925–C where special arrangements have been made. Pads of the forms with instructions will be furnished by the above office upon request. The following minimum data will be usually required from the vessel operators:

(a) Name or number of vessel.
(b) Net registered tons.
(c) Type of vessel.
(d) Flag.
(e) Type of service.
(f) Port or locality of departure.
(g) Dock of departure.
(h) Date of departure.
(i) Maximum draft on departure.
(j) Port or locality of arrival.
(k) Dock of arrival.
(l) Maximum draft on arrival.
(m) Date of arrival.
(n) Name of commodity carried. Refrigerated commodities should be shown separately and so designated.
(o) Quantity of each commodity.
(p) Unit of measurement used.
(q) Weight of unit used.
(r) Localities entered for refuge or repairs.
(s) Port and dock at which fueled.
(t) Kind of fuel.
(u) Project channels used.

Principal data on foreign vessels, including Canadian, are furnished to the Corps of Engineers by the Bureau of the Census and the U.S. Customs. Such vessels will be requested to furnish specific information, such as transit through certain waterways, as required.

§ 207.400 Duluth-Superior Harbor, Minn., and Wis.; use, administration, and navigation, and bridge regulations.

(a)(1) and (a)(2) [Reserved]

(3) *Rafts.* Before a raft may be towed through any of the entrances, channels, or basins of the Duluth-Superior Harbor application shall be made to the District Engineer of the Engineer Department in charge of the locality for specific permission and instructions.

(a)(4) through (a)(8), and (b) [Reserved]

§ 207.410 Keweenaw Waterway, Mich.; use, administration, and navigation.

(a) and (b) [Reserved]

(c) *Rafts.* Passage into or through the waterway or "bag" or "sack" rafts or of loose logs is prohibited. Rafts shall not exceed 100 feet in width or 800 feet in length and shall, in all cases, be handled by sufficient tug power to guide the raft so as to give one-half of the channel to passing vessels.

(d) through (j) [Reserved]

§ 207.420 Chicago River, Ill.; Sanitary District controlling works, and the use, administration, and navigation of the lock at the mouth of river, Chicago Harbor.

(a) *Controlling works.* The controlling works shall be so operated that the water level in the Chicago River will be maintained at a level lower than that of the lake, except in times of excessive storm run-off into the river or when the level of the lake is below minus 2 feet, Chicago City Datum.

(1) The elevation to be maintained in the Chicago River at the west end of the lock will be determined from time to time by the U.S. District Engineer, Chicago, Illinois. It shall at no time be higher than minus 0.5 foot, Chicago City Datum, and at no time lower than minus 2.0 feet, Chicago City Datum, except as noted in the preceding paragraph.

(b) *Lock*—(1) *Operation.* The operation of the lock shall be under the general supervision of the U.S. District Engineer, Chicago, Illinois. The lock gates shall be kept in a closed position at all times except for the passage of navigation.

(2) *Description of lock.*

	Feet
Clear length	600
Clear width	80
Depth over sills	[1] 24.4

[1] This depth is below Chicago City Datum which is the zero of the gages mounted on the lock. The clear depth below Low Water Datum for Lake Michigan, which is the plane or reference for U.S. Lake Survey Charts, is 23.0 feet.

The east end of the northeast guide wall shall be marked by an intermittent red light, and by a traffic light showing a fixed red or fixed green light. The west end of the northwest gate block shall be marked by a traffic light showing a fixed red or fixed green light. The east end of the southeast guide wall and the west end of the southwest guide wall shall be marked by an intermittent white light.

(3) *Authority of lockmasters.* The lockmaster shall be charged with the immediate control and management of the lock, and of the area set aside as the lock area, including the lock approach channels. He shall see that all laws, rules and regulations for the use of the lock and lock area are duly complied with, to which end he is authorized to give all necessary orders and directions in accordance therewith, both to employees of the Government and to any and every person within the limits of the lock or lock area, whether navigating the lock or not. No one shall cause any movement of any vessel, boat, or other floating thing in the lock or approaches except by or under the direction of the lockmaster or his assistants.

(4) *Signals.* (i) Signals from vessels for lockage shall be by whistle or by telephone message from one of the adjacent bridges or terminals. Signals from the lockmaster shall be by the traffic light and/or horn. In case of emergency the lockmaster may signal the vessel by voice or by wave of hand or lantern, and the signals thus given shall have the same weight as though given by visual or sound devices at the lock. Vessels must approach the lock with caution and shall not enter or leave the lock until signaled to do so by the lockmaster. The following lockage signals, and duration of sound signals, are prescribed: A long blast shall be of 4 seconds duration. A short blast shall be of 1 second duration.

(a) *Vessel signals.* Inbound vessels at a distance not more than 4,000 feet from the lock and outbound vessels at a distance not more than 2,000 feet from the lock shall signal for lockage by 2 long and 2 short blasts of a whistle, or telephone from one of the adjacent bridges or terminals.

(b) *Lock signals.* (1) When the lock is ready for entrance, the traffic light will show green, and vessels under 500 gross tons shall come ahead under caution and enter the lock; vessels of 500 gross tons or more shall come to a stop along the guide wall, as prescribed in paragraph 5. Should the traffic light be out of order or be invisible due to thick weather, vessels shall upon 1 long blast of the lock horn approach and moor to the south guide wall or continue into the lock if so directed by the lockmaster.

(2) When the lock is not ready for entrance, the traffic light will show red, and vessels shall not pass beyond the end of the south guide wall: *Provided, however,* That vessels may approach and moor to said wall if authorized by 1 long blast of the lock horn.

(3) Permission to leave the lock shall be indicated by 1 short blast of the lock horn.

(4) Caution or danger will be indicated by 4 or more flashes of the red traffic light or 4 or more short blasts of the lock horn delivered in rapid succession.

(ii) When in the lock, vessels shall not blow whistle signals for tubs, bridges, landings, etc., without the lockmaster's permission.

(iii) The master and chief engineer of each vessel of 500 gross tons or more shall be on duty at their respective stations when passing through the lock.

(5) *Stop before entering.* All vessels or tows of 500 gross tons or more shall come to a full stop at the point indicated by the sign reading "Stop" on the south guide wall and shall not proceed into the lock until so directed by the lockmaster.

(6) *Maximum draft.* Vessels drawing within 6 inches of the depth over the sills shall not be permitted lockage except under special permission from the lockmaster.

(7) *Precedence at locks.* The vessel arriving first at a lock shall be first to lock through; but precedence shall be given to vessels belonging to the United States and to commercial vessels in the order named. Arrival posts or markers may be established ashore above or below the locks. Vessels arriving at or opposite such posts or markers will be considered as having arrived at the locks within the meaning of this subparagraph.

(8) *Lockage of pleasure boats.* The lockage of pleasure boats, house boats or like craft shall be expedited by locking them through with commercial craft (other than barges carrying petroleum products or highly hazardous materials) in order to utilize the capacity of the lock to its maximum. If, after the arrival of such craft, no separate or combined lockage can be accomplished within a reasonable time, not to exceed the time required for three other lockages, then separate lockage shall be made.

(9) *Speed of approach and departure.* Vessels of 500 gross tons or more when approaching the lock shall navigate at a speed not exceeding 2 miles per hour, and when leaving the lock shall navigate at a speed not exceeding 6 miles per hour. While entering or leaving the lock, the propellers of vessels of 500 gross tons or more shall be operated at slow speed so as not to undermine or injure the concrete paving on the bottom of the lock chamber. Tugs assisting vessels in lockage, and Coast Guard and fire vessels, may navigate at a higher speed when authorized by the lockmaster. Vessels of less than 500 gross tons shall operate at reasonable speed.

(10) *Mooring.* (i) Vessels shall be moored in the lock or along its approach walls in such manner as may be directed by the lockmaster. Tying to lock ladders, lamp standards, or railings is strictly prohibited. Commercial vessels and tows of 500 gross tons or more shall in general

have at least one line out when entering the lock and shall be moored in the lock with two bow and two stern lines, which shall lead forward and aft at each end of the vessel or tow. When the gates are closed, commercial vessels shall not be permitted to work their wheels. Said vessels shall have two seamen at each end of the vessel while they are in the lock; one to operate the deck engine and the other to relay the signals from the lock linesman to the deck engine operator. Lines shall not be released or the slack taken in except by signal from the linesman.

(ii) Mooring lines shall not be cast off until after the lock gates have been opened fully into their recesses, and the signal given to leave the lock. The lines leading aft shall be released first. The lines leading forward shall not be released until the vessel has started to move forward, so as to prevent the vessel from drifting back into the lock gates.

(11) *Assistance.* Lock employees will handle lines on the approach and lock walls. However, vessel crews shall furnish such assistance as the lockmaster may require.

(12) *Unnecessary delay at lock.* Masters and pilots must use every precaution to prevent unnecessary delay in entering or leaving the lock. Vessels failing to enter lock with reasonable promptness, when signaled to do so, shall lose their turn. Vessels arriving at the lock with their tows in such shape so as to impede lockage, shall lose their turn.

(13) *Depositing refuse prohibited.* The depositing of ashes or refuse matter of any kind in the lock; the passing of coal from barges or flats while in the lock; and the emission of dense smoke from any vessel while passing through the lock, is forbidden.

(14) *Vessels denied lockage.* The lockmaster may deny the privilege of passage through the lock to any vessel with sharp or rough projecting surfaces of any kind, or overhanging rigging, or any vessel which is badly leaking or in a sinking condition.

(15) *Fenders.* All barges and oil tankers must be provided with suitable nonmetallic fenders so as to eliminate damage to the lock or approach walls and reduce fire hazard. Said fenders shall be used as may be directed by the lockmaster.

(16) *Operating machinery.* Lock employees only shall be permitted to operate the lock gates, valves, signals or other appliances. Tampering or meddling with machinery or other parts of the lock is strictly forbidden.

(17) *Commercial statistics.* Upon each passage through the lock, the master or clerk of each vessel shall furnish the lockmaster, in duplicate, upon prescribed forms, such statistical information as may be required. The forms may be obtained without charge from the lockmaster; *The Sanitary District of Chicago, 910 South Michigan Avenue, Chicago Illinois; or the District Engineer, U.S. Army Engineer District, Chicago, 536 South Clark Street, Chicago 5, Ill.

(18) *Vessels to carry regulations.* A copy of the regulations in this section shall be kept at all times on board each vessel regularly engaged in navigating this lock. Copies may be obtained without charge from the lockmaster; *The Sanitary District of Chicago, 910 South Michigan Avenue, Chicago, Illinois; or from the District Engineer, U.S. Army Engineer District, Chicago, 536 South Clark Street, Chicago 5, Ill.

(19) *Failure to comply with regulations.* Any vessel failing to comply with this section or any orders given in pursuance thereof, may in the discretion of the lockmaster be denied the privilege of passage through or other use of the lock or appurtenant structures.

§ 207.425 Calumet River, Ill.; Thomas J. O'Brien Lock and Controlling Works and the use, administration, and navigation of the lock.

(a) Controlling Works. (1) The controlling works shall be so operated that the water level at the downstream end of the lock will be maintained at a level lower than that of Lake Michigan, except in times of excessive storm runoff into the Illinois Waterway, or when the lake level is below minus 2 feet, Chicago City Datum.

(2) The elevation to be maintained at the downstream end of the lock shall at no time be higher than minus 0.5 feet, Chicago City Datum, and at no time lower than minus 2.0 feet, Chicago City Datum, except as noted in paragraph (a)(1) of this section.

(b) Lock—(1) Operation. The Thomas J. O'Brien Lock and Dam is part of the Illinois Waterway which is a tributary of the Mississippi River. All rules and regulations defined in 207.300, Ohio River, Mississippi River above Cairo, Ill., and their tributaries; use, administration, and navigation shall apply.

§ 207.440 St. Marys Falls Canal and Locks, Mich.; use, administration, and navigation.

(a) The use, administration, and navigation of the canal and canal grounds shall be under the direction of the District Engineer, Engineer Department at Large, in charge of the locality, and his authorized agents. The term "canal" shall include all of the natural waters of the St. Marys River on the United States side of the International Boundary and all of the canalized waterway and the locks therein between the western or upstream limit, which is a north and south line tangent to the west end of the Northwest Pier, and the eastern or downstream limit, which is a north and south line tangent to the northeast corner of the old Fort Brady Reservation, the distance between limits being 1.9 miles. The term "canal grounds" shall include all of the United States part and other lands, piers, buildings, water level regulation works, hydroelectric power plant, and other appurtenances acquired or constructed for the channel improvement and use of the waterway.

NOTE: Rules and regulations governing the movements of vessels and rafts in St. Marys River from Point Iroquois, on Lake Superior, to Point Detour, on Lake Huron, prescribed by the United States Coast Guard

*(New address)—The Metropolitan Sanitary District of Greater Chicago, 100 East Erie Street, Chicago, Illinois; or from the District Engineer, U.S. Army Engineer District, Chicago, 219 South Dearborn Street, Chicago, Illinois, 60604.

pursuant to 33 U.S.C. 475, are contained in Part 92 of this title.

(b) Masters of all registered vessels approaching and desiring to use the locks shall, upon arriving at Sailors Encampment, Little Rapids Cut, and Brush Point, report the name of the vessel and its draft to the Coast Guard Lookout Stations† at those points.

(c) Upon approaching the canal, vessel masters shall request lock dispatch by radiotelephone to the Corps of Engineers Chief Lockmaster at St. Mary's Falls Canal dispatch tower (Radio Call WUD-31). Every upbound vessel shall call when abeam of Bayfield Rock Pile Dike which is approximately one and one-eighth miles downstream from East Center Pier end. Every downbound vessel shall call when approximately one-half mile downstream from Big Point.

(d) When in the locks, vessels shall not blow whistle signals for tugs, supply vessels, or persons unless authorized to do so by the District Engineer or his authorized agents.

(e) On all vessels of 400 gross tons or over navigating the canal under their own power, there shall be on duty the following ship's officers: In the pilot house, on the bridge, or in the immediate vicinity thereof, the master, one mate, and one wheelsman; in the engine room, the chief engineer, one assistant engineer, and one oiler or other member of the crew familiar with the operation of the engine. During transit of the locks, all vessels of 400 gross tons or over equipped with power operated mooring deck winches shall have, in addition to the winch operators, mates or signalmen at the forward and after ends of the vessel to direct operations from points providing maximum vision of both the winch operators and canal linesmen.

(f) Within the limits of the canal, vessels approaching the locks shall not navigate at a speed greater than 2½ miles per hour, and vessels leaving the locks shall not navigate at a speed greater than 6 miles per hour. Tugs assisting vessels in passing the locks may be authorized by the District Engineer or his authorized agents to navigate at a higher speed when considered necessary to expedite canal operations.

(g) For passage through the canal, vessels or boats owned or operated by the United States Government may be given precedence over all others.

(h) All registered vessels will be passed through the locks in the order of their arrival at the canal, unless otherwise directed by the District Engineer or his authorized agents. When a vessel that has stopped on its own business is ready to proceed, it is not entitled to precedence over other vessels already dispatched even though it may have preceded such vessels in arriving at any Coast Guard Lookout Station. Unregistered craft must have a special permit for separate lockage.

(i) Unless otherwise directed, all vessels or boats approaching the locks shall stop at the points indicated by signs placed on the canal piers until ordered by the District Engineer or his authorized agents to proceed into the lock.

(j) Vessels and boats shall not proceed to enter or leave a lock until the lock gates are fully in their recesses and the lockmaster has given directions for starting.

(k) Upon each passage through the canal, the master or clerk of the vessel or craft shall report to the canal office, upon the prescribed form, a statement of passengers, freight, and registered tonnage, and such other statistical information as may be required by the blank forms provided for the purpose.

(l) No business, trading, or loading or landing of freight, baggage, or passengers will be allowed on or over the canal piers or lock walls, or over the other piers within the limits of the canal grounds, except by prior authority of the District Engineer or his authorized agents.

(m) No person shall throw material of any kind into the canal, or litter the grounds with any refuse.

(n) The releasing of vessel steam, water, or waste from side discharge openings upon the piers or lock walls, the cleaning of boiler flues in the locks or canal, or the emission of dense smoke from the stack of any vessel while passing through the locks, is forbidden.

(o) No person shall enter or navigate the canal with a boat or other craft which, when entering or while navigating the canal, shall have an iron or irons projecting from it or a rough surface or surfaces on it which would be liable to damage the lock walls or canal piers.

(p) No person shall cause or permit any vessel or boat of which he is in charge or on which he is employed to in any way obstruct the canal or delay in passing through it, except upon prior authority of the District Engineer or his authorized agents.

(q) No person shall enter upon any part of the canal grounds except as permitted, either generally or in specific instances, by the District Engineer or his authorized agents. No person shall willfully or carelessly injure, tamper with, or damage the canal or any of the Government buildings, works or structures, trees or shrubbery, or other public property pertaining to the canal or canal grounds.

(r) All barges or other vessels navigating within the canal and not operated under their own power, whether approaching or leaving the locks, are required to be assisted by one or more tugs of sufficient power to insure full control at all times.

(s) Smoking and open flames are prohibited on the canal grounds within 50 feet of any tanker transiting the canal and locks, and on board the tanker transiting the locks except in such places as may be designated in the ship's regulations.

(t) All oil tankers, barges, and other vessels which are used for transporting inflammable liquids, either with or without cargo, shall, if not equipped with fixed timber fenders, be prevented from contacting any unfendered pier, lock wall, or other structure by an adequate number of suitable fenders of timber, rubber, or rope placed between the vessel and such unfendered structure.

(u) The locks will be opened and closed to navigation each year as provided in subparagraphs (1) and (2)

†Effective 1974, call Coast Guard Control.

of this paragraph except as may be authorized by the Division Engineer. Consideration will be given to change in these dates in an emergency involving disaster to a vessel or other extraordinary circumstances. However, if requested by the using interests on or before November 1, the closing date may be extended to meet reasonable demands of commerce to the extent that weather and ice conditions permit.

(1) *Opening date.* At least one lock will be placed in operation for the passage of vessels on April 1. Thereafter, additional locks will be placed in operation as traffic density demands.

(2) *Closing date.* The locks will be maintained in operation only for the passage of downbound vessels departing from a Lake Superior Port before midnight of December 14, and of upbound vessels passing Detour before midnight of December 15. Vessel owners are requested to report in advance to the Engineer in charge at Sault Ste. Marie, the name of vessel and time of departure from a Lake Superior Port on December 14, before midnight, and of vessels passing Detour on December 15 before midnight, which may necessitate the continued operation of a lock to permit passage of vessel.

(v) The maximum overall dimensions of vessels that will be permitted to transit MacArthur Lock are 730 feet in length and 75 feet in width, except as provided in paragraph (v)(1) of this section. Further, any vessel of greater length than 600 feet must be equipped with deck winches adequate to safely control the vessel in the lock under all conditions including that of power failure.

(1) Whenever the Poe Lock is out of service for a period exceeding 24 hours the District Engineer may allow vessels greater than 730 feet in length, but not exceeding 767 feet in length to navigate the MacArthur Lock. Masters of vessels exceeding 730 feet in length shall be required to adhere to special handling procedures as prescribed by the District Engineer.

(w) The maximum overall dimensions of vessels that will be permitted to transit the New Poe Lock without special restrictions are 100 feet in width, including fendering, and 1,000 feet in length, including steering poles or other projections. Vessels having overall widths of over 100 feet and not over 105 feet including fendering, and overall lengths of not more than 1,100 feet, including projections, will be permitted to transit the New Poe Lock at such times as the District Engineer or his authorized representative determines that they will not unduly delay the transit of vessels of lesser dimensions or endanger the lock structure because of wind, ice, or other adverse conditions. The latter vessels will be subject to such special handling requirements as may be found necessary by the Area Engineer at time of transit. Vessels over 1,000 feet in length will be required to be equipped with six mooring cables and winches ready for use to assist in safe transit of the lock.

(x) Masters or other persons refusing to comply with the regulations in this section or any orders given in pursuance thereof, or using profane, indecent, or abusive language, may, in the discretion of the District Engineer or his authorized agents, be denied the privileges of the locks and canal grounds.

§ 207.441 St. Marys Falls Canal and Locks, Mich.; security.

(a) *Purpose and scope of the regulations.* The regulations in this section are prescribed as protective measures. They supplement the general regulations contained in § 207.440 the provisions of which shall remain in full force and effect except as modified by this section.

(b) *Restrictions on transit of vessels.* The following classes of vessels will not be permitted to transit the United States locks or enter any of the United States approach canals:

(1) [Reserved]

(2) [Reserved]

(3) [Reserved]

(4) All oil tankers having draft and beam permitting transit through the Canadian lock; those having too great a draft or beam to transit the Canadian lock may continue to use the United States locks. Tankers using the United States locks will not be transited through the MacArthur Lock unless their drafts make it necessary. All tanker transits shall be in single lockages. While in the lock area, smoking by personnel aboard tankers is prohibited in any part of the vessel regardless of locations.

(5) All vessels carrying explosives.

(c) *Personnel restrictions.* Masters of vessels are responsible for the conduct of crew and passengers while transiting St. Marys Falls Canal and Locks and for strict compliance with the regulations. The following procedures are established for the control of persons embarking or debarking from vessels while transiting the locks:

(1) The master or mate and not more than three deckhands will be permitted to go ashore from transiting vessels and then only for normal operations and business incident to the transit. A maximum of four men will be permitted ashore at any one time from any one ship.

(2) *Personnel*—(i) *Embarking.* Personnel, including technicians, repairmen, and company officials will be permitted to embark at the locks if they are in possession of a letter addressed to the Area Engineer, St. Marys Falls Canal, Sault Ste. Marie, Michigan, from the vessel's master, the operators of the vessel, or the Lake Carriers' Association, requesting that the individual named therein be permitted to embark on a particular vessel. United States vessel personnel must also be in possession of a specially validated seaman's document issued by the United States Coast Guard. Their papers will be presented to the civilian guard on duty at the main gate on Portage Avenue who will arrange escort from the gate to the vessel. Luggage will be subject to inspection.

(ii) *Debarking.* The vessel master will furnish prior notification to the Chief Lockmaster at St. Marys Falls Canal Tower (Radio Call WUD-31) that he has vessel personnel, technicians, repairmen or company officials aboard for whom he requests authority to debark. If authority to debark is granted such personnel will be furnished a letter by the vessel master, addressed to the

Area Engineer, St. Marys Falls Canal, Sault Ste. Marie, Michigan, giving the name and position of the individual concerned. Personnel will not debark until they have been properly identified by a licensed officer of the vessel and the letter furnished to the escort provided from the civilian guard detail who will escort personnel to the gate. In the event a person debarking for medical attention is a litter case, notification will be given sufficiently in advance to permit the Chief Lockmaster to route the vessel to the MacArthur Lock in order that the long carry over the lock gates may be avoided. The Area Engineer will make the necessary arrangements for clearance of ambulances and medical personnel into the lock area.

(3) No passengers or guest passengers will be permitted to embark or debark at St. Marys Falls Canal except in emergency when medical attention is required.

(4) Letters cited in subparagraph (2) of this paragraph are valid only for a single passage through the lock area. In the event frequent access to the area is required a request for extended access with reasons therefor will be submitted to the Area Engineer, St. Marys Falls Canal, Sault Ste. Marie, Michigan, who may arrange for the necessary clearance.

(5) Emergency needs to embark or debark which develop with insufficient time to follow the procedure outlined in this paragraph will be approved or disapproved by the Area Engineer, St. Marys Falls Canal, Sault Ste. Marie, Michigan, according to the circumstances of the individual case, and requests therefor should be promptly directed to him.

§ 207.460 Fox River, Wis.

(a) *Use, administration, and navigation of the locks and canals*—(1) *Navigation.* The Fox River and Wolf River navigation seasons will commence and close as determined by the District Engineer, Corps of Engineers, in charge of the locality, depending on conditions and the need for lockage service. Public notices will be issued announcing the opening and closing dates at least 10 days in advance of such dates.

(2) *Authority of lockmaster.* The movement of all boats, vessels, tows, rafts and floating things, both powered and nonpowered, in the canals and locks, approaches to the canals, and at or near the dams, shall be subject to the direction of the Lock Master or his duly authorized representatives in charge at the lock.

(3) *Signals.* All boats approaching the locks shall signal for lockage by four distinct whistles of short duration. Locks will not be opened on such audible signal during the period when advance notice is required if the services of the lock tender are required elsewhere to meet prior requests for lockages.

(4) *Mooring in locks.* All craft being locked shall be secured to the mooring posts on the lock walls. Large craft shall use one head line and at least one spring line. Lines shall remain fastened until the signal is given by the lock tender for the craft to leave the lock.

(5) *Delays in canals.* No boat, barge, raft or other floating craft shall tie up or in any way obstruct the canals or approaches, or delay entering or leaving the locks, except by permission from proper authority. Boats wishing to tie up for some hours or days in the canals must notify the Project Engineer directly or through a lock tender, and proper orders on the case will be given. Boats so using the canals must be securely moored in the places assigned, and if not removed promptly on due notice, will be removed, as directed by the Project Engineer at the owner's expense. Boats desiring to tie up in the canals for the purpose of unloading cargoes over the canal banks must, in each case, obtain permission in advance from the District Engineer. Request for such permission shall be submitted through the Project Engineer.

(6) *Provisions for lockage service.* (i) Commercial vessels, barges, rafts and tows engaged in commerce will be provided lockages during the same period as provided for pleasure boats (see subdivision (iv) of this subparagraph.)

(ii) Pleasure boats, powered and nonpowered, houseboats and similar craft will be provided with not more than one lockage each way through the same lock in a 24-hour period.

(iii) All small vessels or craft, such as skiffs, sculls, sailing boats, etc., shall be passed through locks in groups of not less than six at one lockage, or may be granted separate lockage if the traffic load at the time permits.

(iv) All craft will be given lockage at De Pere and Menasha Locks between 8 a.m. and 12 midnight daily during the recreational boating season as established by the District Engineer. At all intermediate locks above De Pere and below Menasha, lockages without prior notice will be provided between the hours of 10 a.m. and 6 p.m. daily. In addition, lockages will be provided during certain other hours at the intermediate locks provided prior requests are made to the Corps of Engineers, Fox River Project Office.

NOTE 1. a. Requests may be made either in writing, by telephone or in person to the U.S. Army, Corps of Engineers, Fox River Project Office, 1008 Augustine Street, Kaukauna, Wisc. 54130, telephone: 414-766-3531.

b. Regular business hours of the Fox River Project Office are from 7:30 a.m. to 4 p.m., Monday through Friday.

c. During the period from the Saturday before Memorial Day to the Sunday after Labor Day, the Menasha and De Pere Locks will be operational between 11 a.m. and 1 p.m on Saturdays, Sundays and holidays to receive requests for additional lockages at the intermediate locks.

d. Requests will include name, address, business and home telephone numbers as well as name and registration number of the boat and the approximate time of lockage requirements at each of the locks involved.

e. Only one request need be given for groups of boats.

f. If, for any reason, a requested lockage will not be made or must be delayed unreasonably, prompt notice must be given to the Fox River Project Office, or, if after office hours (See "b" and "c" above), to the Lockmaster at either Menasha or DePere Locks.

NOTE 2. For lockages between 8 a.m. and 10 a.m. at all the intermediate locks:

a. Request for lockages during these hours must be received in the Fox River Project Office no later than 1 p.m.

b. Requests for lockages on Sundays and Mondays must be received no later than 1 p.m. on preceding Fridays except as noted in c below.

c. During period covered by Note 1c, above, requests will be received no later than 1 p.m. on the day before lockage is required.

NOTE 3. For lockages between 6 p.m. and 12 midnight—at all intermediate locks:

a. Requests for lockages during this period must be received in the Fox River Project Office no later than 1 p.m. on the day lockage is required.

b. Requests for lockages on Saturdays and Sundays must be received no later than 1 p.m. on preceding Fridays except as noted in c below.

c. During the period covered by Note 1c above, requests will be received no later than 1 p.m. on the day lockage is required.

NOTE 4. In order for a boat to complete a trip between the Intermediate Locks after 6 p.m. locking service will be made available without prior request provided the boat is in the intermediate lock system before 6 p.m.

NOTE 5. In order for a boat to complete a trip, northbound lockage serviec at the Little Kaukauna Locks will be made available between 6 p.m. to 12 midnight, without the prior request described in Note 3 above, provided notice of requirement is given to the lockmaster at this lock prior to 6 p.m.

NOTE 6. For lockages between 6 p.m. and 11 p.m. at Little Kaukauna Lock:

Lockages will be granted north and southbound at Little Kaukauna Lock without prior request from 6 p.m. to 11 p.m. on Friday, Saturday, Sunday, and holidays from the weekend before Memorial Day through the weekend after Labor Day.

(7) *Injury to locks or fixtures.* Vessel operators shall use great care not to strike any part of the locks or sluice walls, or any gate or appurtenance thereto, or machinery for operating the gates, or the walls protecting the banks of the canals. All boats using the canals shall be free from projecting irons or rough surfaces that would be liable to damage the locks or any part of the canals, and they must be provided with fenders to be used in guarding the lock walls, etc., from injury. Boats will not be permitted to enter or leave the locks until the lock gates are fully in the gate recesses, and the lock tender has directed the boat to proceed. No vessel shall be raced or crowded alongside another vessel, or be moved at such speed as will cause excessive swells or wash. Speed shall be kept at a minimum consistent with safe navigation.

(8) *Handling gates.* No one, unless authorized by the lock tender, shall open or close any gate, or valve, or in any way interfere with the employees in the discharge of their duties. The lock tender may call for assistance from the master of any boat using the lock should such aid be needed.

(9) *Draft of boats.* No boat shall enter a canal or lock whose actual draft exceeds the least depth of water in the channel of the canal as given by the Project Engineer.

(10) *Right-of-way.* Boats going downstream shall have the right-of-way over boats going upstream. Ordinarily, the boats or tows arriving first at any of the locks shall have precedence in passage except that those vessels which have given advance notice, when such notice is required, shall have precedence over other vessels when such notifying vessel is ready for passage. In all cases boats and barges belonging to the United States, or employed upon public works, shall have precedence over all others, and commercial passenger boats shall have precedence over tows. All boats not taking advantage of the first lawful opportunity to pass shall lose their turn. When lockage has started on tows requiring multiple lockages, all units of the tow will be locked ahead of other vessels traveling in the same direction. In the case of tows requiring two lockages, any craft awaiting lockage in the opposite direction will have priority over the second lockage of the tow.

(11) *Boats and rafts without power.* No boat or raft without power except small boats controlled by sails or oars shall be brought through the canal unless accompanied by a power operated boat.

(12) *Dumping of refuse in waterway.* No refuse or other material shall be thrown or dumped from vessels

NORMAL AND ADDITIONAL LOCKAGE TIMES

Lock location	Normal lockage times without prior request	Additional lockage times with prior request (Note 1)	Notes
Menasha	8 a.m. to 12 midnight	None	None.
Appleton	10 a.m. to 6 p.m	8 to 10 a.m., 6 p.m. to 12 midnight.	2, 3, and 4.
Cedars	do	do	Do.
Little Chute	do	do	Do.
Combined	do	do	Do.
Kaukauna	do	do	Do.
Rapide Croche	do	do	Do.
Little Kaukauna	do	do	2, 3, 4, 5, and 6.
DePere	8 a.m. to 12 midnight	None	None.

into the natural river, improved channels, canals and locks or placed on any bank of the river or berm of the canals so that it is liable to be thrown or washed into the waterway. (Section 13 of the River and Harbor Act of March 3, 1899 (30 Stat. 1152; 33 U.S.C. 407) prohibits the depositing of any refuse matter in any navigable water or along the banks thereof where the same shall be liable to be washed into such navigable water.)

(13) *Drawing off water.* No water shall be drawn by any party or parties from any portion of the Fox River canals, or of the Fox River, including its lakes, improved channels, and unimproved channels, to such extent as to lower the water surface below the crest of that dam next below the place where such draft of water is affected.

(14) *Obstructing navigation.* Anyone who shall willfully or through carelessness in any way obstruct the free navigation of the waterway, or by violation of any of the laws or regulations governing the waterway and those using it, delay or inconvenience any boat having the right to use the waterway, shall be responsible for all damages and delays, and for all expenses for removing the obstructions. (Section 20 of the River and Harbor Act of March 3, 1899 (30 Stat. 1154; 33 U.S.C. 415), authorizes the immediate removal or destruction of any sunken vessel, craft, or similar obstruction, which impedes or endangers navigation.)

(15) *Commercial statistics.* (i) As required by section 11 of the River and Harbor Act of September 22, 1922 (42 Stat. 1043; 33 U.S.C. 555), owners, agents, masters, or clerks of vessels plying the waterway shall submit a report on such activities for statistical purposes which shall contain the following information:

Name of vessel.

Name and address of owner or operator.

Type of vessel—steam, motor, sail, barge, or other type.

Number of passengers.

Net registered tonnage—if not registered, approximate net tonnage.

Maximum draft at time of passage.

Cargo—by commodities, expressed in tons, or other units by which such commodities are customarily measured, giving origin and destination.

(ii) The report shall be mailed promptly to the District Engineer, Chicago District, Corps of Engineers, Attn: Construction—Operations Division—Statistics, 219 South Dearborn Street, Chicago, Ill. 60604, on forms furnished free of charge by that office. On written request, persons or corporations making frequent use of the waterway may be granted permission to submit monthly statements in lieu of reports by trips.

(16) *Trespass on United States property.* Trespass on waterway property or injury to the banks, locks, dams, canals, piers, fences, trees, buildings, or any other property of the United States pertaining to the waterway is strictly prohibited. No business, trading or landing of freight or baggage will be allowed on or over Government property, unless a permit or lease approved by the Secretary of the Army has been secured.

(17) *Neenah dam outlet works.* (i) During periods of high water, when determined to be necessary by the District Engineer, U.S. Army Engineer District, Chicago, to reduce the threat of flooding, it shall be the duty of the person owning, operating, or controlling the dam across the Neenah Channel of the Fox River at Neenah, Wis., acting as agent of the United States, to open or close, or cause to be opened or closed, pursuant to subdivision (ii) of this subparagraph, the outlet works of said dam to regulate the passage of water through said outlet works.

(ii) The outlet works of said dam shall be opened when and to the extent directed by the District Engineer or his authorized field representatives, and said outlet works shall thereafter be closed when and to the extent directed by the said District Engineer or his authorized field representative.

(b) *Use of the United States drydock on Fox River at Kaukauna, Wis.* (1) The drydock being a part of the Fox River improvement, its use will be governed by the general regulations for the use, administration, and navigation of that river, so far as they may be applicable.

(2) The drydock at Kaukauna, when not required for repairs or construction by the United States, may be used by private parties or corporations under certain restrictions and under the supervision and direction of the United States District Engineer in charge of the locality or his authorized agent.

(3) The drydock will be loaned to private parties only when no private drydock is available at the time and for the purpose desired. Applicants will be required to establish over their signature the fact that due effort has been made to secure the use of a private drydock and none can be had.

(4) Private parties desiring to use the Kaukauna drydock will give notice to the United States Assistant Engineer in local charge at Appleton, Wis., as long in advance as practicable, stating when use of the dock is wanted, nature of repairs required, and the dimensions and character of boat. No boat will enter the dock until the permission of the United States District Engineer or the Assistant Engineer above referred to has been obtained.

(5) All private parties or corporations using the Kaukauna drydock will furnish all material and labor, including blocking, when necessary, required for prompt execution of their work, and will also furnish all labor for properly operating, under the immediate personal supervision of an authorized canal employee, gates, and sluices of the drydock. No gate or sluice of the drydock will be operated, or in any way meddled with, except by permission of and under the personal supervision of such authorized canal employee.

(6) No boat will be allowed to occupy the Kaukauna drydock for a longer period than 2 days when other boats are waiting to use the dock, except in cases when, in the opinion of the United States District Engineer or his authorized agent, circumstances necessitate and justify a longer use than 2 days. The United States District Engineer or his authorized agent is authorized to remove from the drydock any boat using or occupying such dock without his authority, and the expense of such removal will be paid by the party or parties owning such boat.

(7) The wages of all mechanics and laborers, due from private parties for repairs carried on in the Kaukauna drydock, must be paid before the boat leaves the dock.

(8) Repair shop, timber shed, tools, etc., owned by the Government at and near the drydock shall not be used by parties allowed to occupy the drydock.

(9) Lumber and all material needed by parties allowed to use the drydock may be deposited in the drydock yards at such places as may be directed, but only for such time as repairs are being made, and residue must be entirely removed when the boat leaves the dock; general storage will not be permitted.

(10) All refuse and old material taken from boats under repairs must be removed or disposed of, as may be directed, by the owner of the boat or his employees without expense to the Government, and before the boat leaves the dock, and to the satisfaction of the agent in charge of the dock.

(11) The Government charges for the authorized and necessary use and occupancy of the Kaukauna drydock by private boats shall be, until further orders, as follows:

(i) Docking charges (including lay time for the calendar day on which vessel is docked): Tugs, motor boats, and dredges, 75 cents per linear foot; $25 minimum charge. Barges, dump scows, and derrick boats, 65 cents per linear foot; $20 minimum charge.

(ii) Lay-day charges (excluding Sundays and national holidays, unless repairs are made on such Sundays and holidays): For all vessels, 20 cents per linear foot per calendar day or part thereof; $7 per calendar day or part thereof, minimum charge.

(12) The charges for all use or occupancy of the Kaukauna drydock by a boat or private parties, after repairs on such boat have, in the opinion of the United States District Engineer or authorized agent, been so far completed as to permit safe removal from the dock, or after such removal has been ordered by the United States District Engineer or his authorized agent, shall be $50 per day or part of a day, in addition to any penalties incurred for violation of any of the regulations prescribed by law for the government of the dock and those using it.

(13) The dock will be considered in use by a boat from the time the dock is placed at its disposal until the boat is out of the dock.

(14) The length of all vessels shall be the over-all length measured on the main deck from stem to stern.

(15) The charges for the use of the drydock shall be paid within 10 days from date of bill, which will be submitted to the owner by the District Engineer as promptly as possible after the vessel leaves the dock. If charges are not so paid, the vessel shall be liable to the amount of the charges and the cost of collection in the manner prescribed by law, and the owner of the vessel shall be denied the use of the drydock until all charges and the cost of collection have been paid to the United States.

(16) This section supersedes the regulations for the use of this drydock approved April 10, 1906, which regulations are hereby revoked.

§ 207.470 Sturgeon Bay and Lake Michigan Ship Canal, Wis., use and navigation.

(a) through (g) [Reserved]

(h) *Rafts.* (1) The passage of bag or sack rafts, or of loose logs, into or through the canal is prohibited.

(2) Rafts shall be made up with logs parallel to each other, in the direction of raft lengths, secured and held closely together by frequent cross-sticks, chains, or cable.

(3) Rafts shall not be of greater dimensions, either way, than 50 feet wide by 600 feet long, and if longer than 300 feet shall be handled by two tugs.

(4) No raft shall pass through the canal, unless by special permission of the superintendent or his authorized assistants, who will direct a time for passing that will least interfere with other navigation.

(5) Masters of tugs and other persons in charge of rafts are required to avoid damaging the canal revetments, and displacing buoys, spars, or the pedestal of any range light aiding navigation through the canal. They shall keep careful watch when passing aids to navigation, and should any be accidentally displaced, shall report the fact at the earliest possible moment to the superintendent or his authorized assistants.

(i) through (l) [Reserved]

(m) *Refuse in canal.* No person shall roll or throw any stones, ashes, cinders, or other material into the canal or the approaches thereto, or place any such material on any bank or berm of the canal so that it is liable to be thrown or roll in.

(n) [Reserved]

(o) *Commercial statistics.* The masters or clerks of all vessels using the canal (except in the case of vessels merely entering to seek a harbor of refuge from storms and not bound through) shall furnish in writing to the superintendent a detailed statement of passengers and cargo carried.

§ 207.473 Waukegan Harbor, Ill.

(a) All vessels or other craft are forbidden to tie to or lie alongside of the United States harbor piers at Waukegan, Illinois, except when they are engaged on Government business, or are compelled to tie to or lie alongside of the piers by stress of weather or accident, or to prevent loss of life or property.

(b) [Reserved]

§ 207.475 Lake Michigan; naval restricted area, United States Naval Training Center, Great Lakes, Ill.

(a) *The area.* An area extending in a north and south direction from the Great Lakes, Illinois, south breakwater to an east-west line projecting eastward from the shore termination of the north fence of the United States Naval Training Center, Great Lakes, Illinois, and extending into Lake Michigan for a distance of one mile from the shoreline.

(b) *The regulations.* No vessel of any kind, except those engaged in naval operations, shall enter, navigate, anchor, or moor in the restricted area without first obtaining permission to do so from the Commander, United States Naval Training Center, Great Lakes, Illinois, or his authorized representative.

§ 207.476 The Inland Route—lock in Crooked River, Alanson, Mich., use, administration, and navigation.

(a) *General.* The use, administration, and navigation of the lock shall be under the direction and supervision of the District Engineer, U.S. Army Engineer District, Detroit, Mich., and his authorized agents.

(b) *Authority of lockmaster.* The lockmaster shall be charged with the immediate control and management of the lock, and of the area set aside as the lock area, including the lock approach channels. He shall see that all laws, rules, and regulations for the use of the lock and lock area are duly complied with, to which end he is authorized to give all necessary orders and directions in accordance therewith, both to the employees of the Government and to any and every person within the limits of the lock area, whether navigating the lock or not. No one shall cause any movement of any boat, craft or other floating object in the lock or approaches except by or under the direction of the lockmaster or his assistants.

(c) *Schedule of seasonal operation.* (1) April 15 through May 31—6 a.m., e.s.t., to 10 p.m., e.s.t., daily.

(2) June 1 through August 31—6 a.m., e.s.t., to 11 p.m., e.s.t., daily.

(3) September 1 through November 15—6 a.m. e.s.t., to 10 p.m., e.s.t., daily.

(4) The lock shall not be operated for the passage of craft during the period from November 16 through April 14 of the following year.

(d) *Maximum allowable dimensions of craft.* (1) Overall length—60 feet.

(2) Overall width—16 feet.

(3) Height above water—15 feet when upper pool is at low water datum.

(4) Draft—6 feet when lower pool is at low water datum.

(e) *Signals.* (1) Craft desiring lockage in either direction shall give notice to the lock tenders, when not farther than 200 yards from the lock, by one long blast (of 10 seconds duration) followed by one short blast (of 3 seconds duration) of whistle, horn, or siren.

(2) Craft not equipped with whistle, horn, or siren may signal for lockage by use of the signal provided for this purpose located near the extreme end of the guide wall to the starboard side of the craft, both upbound and downbound.

(f) *The procedures for transit of lock.* (1) Stand clear of the lock while the red signal light shows.

(2) When the green signal light shows and the lock horn sounds three blasts, approach and enter the lock.

(3) Full control of the craft must be maintained while entering the lock.

(4) After entrance to the lock is complete, the craft shall be securely moored to the cleats and bitts situated on the lock wall.

(5) While moored in the lock, the operator of the craft shall maintain constant attention to the mooring lines, to provide slack or retain tautness as needed.

(6) The craft shall remain securely moored until the exit lock gate is fully open and the lock horn sounds one blast.

(7) When the exit lock gate is fully open and the lock horn has sounded one blast, the craft shall immediately leave the lock under full control of its operator.

(g) *Deviation from schedule and procedure.* The District Engineer may authorize the temporary opening of both upper and lower lock gates to permit unobstructed passage for special purposes. A public notice will be issued advising interested parties of such deviation prior to the effective date thereof.

(h) *Precedence at lock.* The craft arriving first at the lock shall be first to lock through; but precedence will be given to craft belonging to the United States or to other local government entities, such as State, county, or municipality. Arrival posts may be established above and below the lock. Craft arriving at or opposite such posts or markers will be considered as having arrived at the locks within the meaning of this paragraph.

§ 207.480 Lake Huron, Mich.; Harbor of refuge, Harbor Beach, use and navigation.

(a) All boats, barges, and vessels entering the harbor will be required to take such positions as may be assigned them by the officer in charge, who will direct their movements, either from the breakwater or from the Government tug on the harbor.

(b) In the absence of any directions as to position, boats, barges, and vessels entering the harbor will observe the following rule: The first steam vessel, or the first steam vessel with consort in tow, on entering the harbor for shelter, will proceed to the upper end of the breakwater. All steam vessels, and all steam vessels with consorts in tow, entering later, will place themselves in a compact position close to those preceding them. Sailing craft will so locate themselves that they will not lie in the way of other vessels entering the harbor. All vessels of every description will in no way place themselves so as to interfere with the work of reconstruction of piers, or repairs, that may be in progress at the time.

(c) The use of chains in making fast to the breakwater will not be permitted. Lines must be attached to the snubbing posts only, and outboard anchors taken in.

(d) Steam craft with barges or vessels in tow will, if practicable, at once place them compactly alongside the breakwater, either taking in the towlines entirely or passing them on the breakwater so as not to interfere in any way with the landing or departure of boats or vessels between them. If impracticable to place them alongside the breakwater, they will each drop anchor and at once take in all towlines extending from one to the other.

(e) Passenger boats will, in general, have the preference as to location and attention by the officer in charge. Rafts will give way to all documented craft.

(f) All classes of boats, barges, vessels, or other floating property making fast to the breakwater must at once place such fenders between themselves and the breakwater as may be thought necessary by the officer in charge to prevent chafing or other damage.

(g) The unloading of wood, coal, ballast, stone, or freight of any class upon the breakwater is expressly prohibited, except in certain cases allowed by special permission from the officer in charge.

(h) Each and every piece of floating property made fast to the breakwater, or anchored in the harbor, must keep outboard from sunset to sunrise a conspicuous white light, and must have upon it and in immediate charge of it a watchman during the entire time such floating property is in the harbor. All colored lights must be at once taken in, or covered, on dropping anchor or making fast to the breakwater.

§ 207.490 Cheboygan River, Mich.

(a) *Logging.* The following regulations are prescribed for the Cheboygan River, a navigable waterway of the United States, whereon the floating of loose timber and logs and sack rafts (so-called) of timber and logs is the principal method of navigation:

(1) Steamboats and sailing craft shall have the right to navigate the Cheyboygan River at all times.

(2) Loose timber and logs shall be formed into rafts on the right or east half of the river and within the first thousand feet north of the bridge. Such rafts must be at all times guyed with lines at intervals not exceeding 125 feet and of such length as to keep the sides of the boom practically parallel and within 80 feet of each other.

(3) All loose logs floated from the upper stream for the purpose of forming rafts shall pass through the east channel of the swing bridge, the west channel being kept clear at all times.

(4) Rafts shall be so guyed to the easterly shore of the river that the westerly edge of the raft shall not pass the axis of the river.

(5) The trip boom above the bridge for the purpose of guiding logs through the eastern channel shall be kept open at all times, except when free logs are running for the formation of a raft or for some similar purpose. When the trip boom is closed the Cheboygan Boom Co. shall keep a man at said boom so as to open same readily and promptly for all vessels or boats desiring to pass.

(6) Vessels shall not at any time lie in the stream for purposes of loading, or for any other purpose, but must, when not in transit to or from the harbor, lie against some wharf or the bank.

(b) *Floating of logs in Inland Route and connecting waters between Cheboygan and Conway, Mich.* (1) All logs in streams shall be kept in motion except when being boomed for storage.

(2) In booming logs for storage the owners of the logs shall keep a well-defined channel open for navigation.

(3) All booms shall be tied securely at both ends to prevent the swinging of the booms with a change of the wind.

§ 207.560 Sandusky Harbor, Ohio; use, administration, and navigation.

(a) through (c) [Reserved]

(d) No vessel shall moor or anchor to any structure of the United States without the consent of the District Engineer, U.S. Army, in charge of the locality, or his authorized agent.

(e) No vessel shall moor or anchor in or along any improved channel or basin in such manner as to interfere with improvement or maintenance operations therein. Whenever in the opinion of the District Engineer any vessel is so moored or anchored, the owner thereof shall cause said vessel to be moved upon notification from and within the time specified by said District Engineer.

§ 207.565 Vermilion Harbor, Ohio; use, administration, and navigation.

(a) and (b) [Reserved]

(c) No vessel or other craft shall moor or anchor to any structure of the United States without the consent of the District Engineer, Corps of Engineers.

(d) No vessel or other craft shall moor or anchor in or along any improved channel or basin in such a manner as to interfere with the improvement or maintenance operations therein. Whenever in the opinion of the District Engineer any vessel or craft is so moored or anchored, the owner thereof shall cause such vessel or craft to be moved upon notification from, and within the time specified by, the District Engineer.

§ 207.570 Harbors of Huron, Lorain, Cleveland, Fairport, Ashtabula, Conneaut, Ohio; use, administration, and navigation.

(a) and (b) [Reserved]

(c) No vessel shall moor or anchor to any structure of the United States without the consent of the District Engineer, U.S. Army, in charge of the locality, or his authorized agent.

(d) No vessel shall moor or anchor in or along any improved channel or basin in such manner as to interfere with improvement or maintenance operations therein. Whenever in the opinion of the District Engineer any vessel is so moored or anchored, the owner thereof shall cause said vessel to be moved upon notification from and within the time specified by said District Engineer.

§ 207.580 Buffalo Harbor, N.Y.; use, administration, and navigation.

(a) and (b) [Reserved]

(c) No vessel shall moor or anchor to any structure of the United States without the consent of the District Engineer, U.S. Army, in charge of the locality, or his authorized agent.

(d) No vessel shall moor or anchor in or along any improved channel or basin in such manner as to interfere with improvement or maintenance operations therein. Whenever in the opinion of the District Engineer any vessel is so moored or anchored, the owner thereof shall cause said vessel to be moved upon notification from and within the time specified by said District Engineer.

§ 207.590 Black Rock Canal and Lock at Buffalo, N.Y.; use, administration and navigation.

(a) The term "canal" when used in this section will mean all of the Black Rock Waterway, including Black Rock Lock, and all of the lands, piers, buildings, and other appurtenances acquired by letters patent from the State of New York, or constructed for the use of the waterway; the southerly limit thereof being at the southerly end of Bird Island Pier, and the northerly limit being at the downstream end of the guide pier, Black Rock Lock, a length of 3.7 miles.

(b) The canal and all of its appurtenances and the use, administration and navigation thereof shall be in charge of the District Engineer, U.S. Army Engineer District, in charge of the locality, or his authorized agents.

(c) The movement of all vessels, boats, or other floating things in the canal shall be under the direction of the authorized agents of the District Engineer in charge, and their orders and instructions must be obeyed.

(d) For passage through the canal, vessels or boats belonging to the U.S. Government shall have precedence over all others.

(e) All registered vessels or boats must pass through the canal in order of their arrival at the canal limits, unless otherwise directed in accordance with this section.

(f) [Reserved]

(g) No vessel shall pass or approach within ¼-mile of a vessel bound in the same direction in the Black Rock Canal south of the Ferry Street Bridge. Tugs without tows, tugs towing a single barge under 150 feet in length, and single vessels under 150 feet in length are exempt from this paragraph.

(h) No vessel or boat shall anchor in or moor along the canal except at localities specially designated by the District Engineer or his agent; and no business, trading, or landing of freight or baggage, except such articles as may be readily carried in the hand, will be allowed on or over the canal lands or structures, without the permission of the District Engineer or his agent.

(i) No person or operator of a vessel in the Black Rock Canal, lock or approaching channels shall throw or discharge or permit to be thrown or discharged any solid material of any kind or any petroleum product of any kind into the canal, lock or appurtenant waters.

(j) All vessels and tows shall be navigated with care so as not to strike or disturb the channel buoys or channel markers. If a buoy or other channel marker is accidentally struck, damaged or displaced, the fact shall be reported immediately to the Black Rock Lock, foot of Bridge Street, Buffalo, N.Y., telephone 876-5454.

(k) Ferry Street Bridge: The clear headroom under the bridge at low water datum is 17.3 feet for a width of 86 feet from the pivot pier, thence decreasing to 12.3 feet at the left (westerly) abutment.

(1) All vessels and boats which cannot pass under the bridge shall, on approaching the bridge, reduce speed sufficiently to enable them to come to a dead stop, without touching the bridge, in case the movable span cannot be lifted. If the wind is dangerously strong, passage of the bridge shall not be attempted by large vessels without the aid of a tug or tugs.

(2) Vessels and boats bound north shall have the right-of-way and priority for passage through the bridge over those bound south.

(3) All vessels and boats desiring passage through the bridge shall signal therefor by one long and two short whistle blasts.

(4) Upon receiving the opening signal, the bridge operator shall answer by giving the same signal on the bridge whistle and he shall then proceed at once to lift the bridge.

(5) In case the bridge cannot be lifted, for any cause, the bridge operator shall answer a vessel signal by giving five short whistle blasts; and the vessel shall then be stopped until the bridge is ready to be lifted, when the bridge operator shall give the whistle signal for passage and the vessel may proceed.

(6) In case the bridge is disabled so that it cannot be lifted for one-half hour or more pending repairs, red flags will be displayed on the bridge in daytime and two red lantern lights, one above the other, at night; and when such signals are displayed no vessel or boat shall signal for or attempt passage through the bridge.

(l) Radio Control of vessel movement in Black Rock Canal: (1) The movement of vessels in the Black Rock Canal will be controlled by radio communication between the Black Rock Lock and the vessels desiring to use the canal. Vessels will not be permitted to meet or pass in the channel of restricted width between the southerly end of Bird Island (approximately 3,500 feet northerly along the canal from the North Breakwater South End Light) and the International Railway Bridge near the southerly entrance to the Black Rock Lock. Vessels less than 150 feet in length and tugs towing a single barge under 150 feet in length are not to be included in this special condition. In addition to the control of vessel movements in the restricted section of the canal, radio communications will also be utilized to facilitate the passage of vessels through the entire canal and the Black Rock Lock.

(2) Radio communication will be the only means of control of vessel traffic in the canal in order to prevent a meeting or passing of vessels in the restricted area, and therefore it is mandatory that all vessels over 150 feet in length and tugs towing a barge or barges over 150 feet in combined length of tow be equipped with radio communication equipment operating on designated frequencies. Any vessel lacking such equipment will not be permitted to enter the canal unless arrangements are made with the Black Rock Lock by land telephone to 876-5454 or marine ship-to-shore facilities immediately before entering the canal.

(3) The Black Rock Lock radio communications equipment operates on VHF(FM) frequencies as follows: VHF—156.8 MHz—Channel 16—Safety and Calling, VHF—156.7 MHz—Channel 14—Working; VHF—156.6 MHz—Channel 12—Working. A listening watch is maintained on VHF Channel 16.

(4) In order that positive control may be maintained it is mandatory that the following procedures be followed in communicating by radio with the Black Rock Lock:

(i) Vessels desiring to enter the Black Rock Canal from either the Buffalo Outer Harbor or the Buffalo River shall call the Black Rock Lock on VHF Channel 16 or by land telephone approximately 15 minutes before the estimated time of arrival at Buffalo Harbor Traffic Lighted Bell Buoy 1 located at latitude N. 42°50.1′ and longitude W. 78°55.4′. Information to be furnished the Black Rock Lock Operator should include the name of the vessel, posi-

tion, destination, length, draft (forward and aft), and the type of cargo. A second call shall be made to the lock when the vessel is abreast of the Buffalo Harbor Light on the southerly end of the detached West Breakwater. Information furnished the vessel by the Lock Operator will assure the vessel operator of the proper time to enter the Black Rock Canal with a view to safety and minimum delay.

(ii) Vessels desiring to enter the Black Rock Canal from either the Buffalo Outer Harbor or the Buffalo River shall call the Black Rock Lock on VHF Channel 16 or by land telephone to 876–5454 immediately before departing a dock and again when abreast of the North Breakwater South End Light on the southerly end of the North Breakwater.

(iii) In any radio communication from a vessel to the Black Rock Lock, the VHF(FM) frequencies will be used.

(iv) When an initial radio contact has been made with the Black Rock Lock the vessel entering the canal shall maintain a standby watch at the radio until the passage through the canal and lock is completed.

(v) Failure to comply with the foregoing procedures could result in considerable delay to a vessel and possibly in a collision between vessels in the restricted section of the canal.

(m) Black Rock Lock: All vessels and boats desiring to use the lock shall signal by two long and two short whistle blasts.

(1) Northbound vessels and boats shall not be brought to within less than 300 feet of the upper lock gates, nor shall southbound vessels be brought to within less than 200 feet of the lower lock gates, until the lock is made ready and the lockmaster in charge signals the vessel to enter the lock.

(2) Vessels and boats shall not moor to the approach walls of the lock at either end, for any other purpose than waiting for lockage, except by direction or permission of the lockmaster.

(3) Commercial vessels will receive preference in passage through the locks. Small vessels such as row, sail, and motor boats, bent on pleasure only, will be passed through the lock in company with commercial vessels when small vessels can be safely accommodated or in the absence of commercial vessels may be passed through the lock individually or together in one lockage on the hour if northbound, and on the half hour if southbound. However, commercial vessels will receive preference which could delay the passage of pleasure craft. Pleasure craft will not be permitted to pass through the lock with vessels carrying inflammable cargo. Vessels and other large boats when in the lock shall fasten one head line and one spring line to the snubbing posts on the lock walls, and the lines shall not be cast off until the signal is given by the lockmaster for the boats to leave the lock.

(4) Vessels and boats will be passed through the lock in order of their arrival except that the lockmaster may order a small vessel to lock through in company with another vessel, irrespective of the former's order of arrival.

(5) All vessels and boats shall be maneuvered with great care so as not to strike any part of the lock walls, or any gate or appurtenance thereto, or machinery for operating the gates, or the walls protecting the lock approaches.

(6) Vessels and boats shall not enter or leave until the lock gates are fully in their recesses, and the lockmaster has given direction for starting.

(7) Upon each passage through the lock, masters or clerks of all vessels and boats (except small motor boats and pleasure craft) shall report to the lock office a statement of passengers, freight, and such other statistical information as may be required by the blank forms which are issued to them for the purpose.

(8) Trespass on lock property is strictly prohibited. However, in that portion of the Black Rock Canal lying between the International Railway Bridge and the northerly end of the westerly lower guide pier, the following conditions shall apply to the embarking or disembarking of crew members or passengers of a vessel transiting the lock:

(i) Only the master or mate and two or three linesmen will be permitted to go ashore from transiting vessels and then only for normal operations and business incident to the transit. A maximum of only four (4) men will be permitted to go ashore from any one ship.

(ii) No crew members will be permitted to board a ship at the locks unless previously requested in writing by the master or owners, and approved by canal authorities.

(iii) No crew member may leave a ship while it is in transit in the lock or canal unless certified in advance as an emergency by the vessel master and approved by canal authorities.

(iv) No guest passengers will be permitted to either board or disembark at the canal or locks.

§ 207.600 Rochester (Charlotte) Harbor, N.Y.; use, administration, and navigation.

(a) and (b) [Reserved]

(c) No vessel shall moor or anchor to any structure of the United States without the consent of the District Engineer, U.S. Army, in charge of the locality, or his authorized agent.

(d) No vessel shall moor or anchor in or along any improved channel or basin in such manner as to interfere with improvement or maintenance operations therein. Whenever in the opinion of the District Engineer any vessel is so moored or anchored, the owner thereof shall cause said vessel to be moved upon notification from and within the time specified by said District Engineer.

§ 207.610 St. Lawrence River, Cape Vincent Harbor, N.Y.; use, administration, and navigation of the harbor and United States breakwater.

(a) through (c) [Reserved]

(d) Vessels shall observe the following rule in mooring to the breakwater: The first self-propelled vessel stopping at the harbor for shelter will proceed to the upstream end of the breakwater and moor along either side of it. All

similar vessels entering later will place themselves in a compact position close to those preceding them. Passenger vessels will, in general, have preference as to location of moorage. Sailing craft will so locate themselves that they will not lie in the way of other vessels entering the harbor. All vessels of every description will place themselves so as not to interfere with any work of reconstruction or repair that may be in progress at the time.

(e) The use of chains in making fast to the breakwater is prohibited. Lines must be attached to the snubbing posts only, and outboard anchors taken in.

(f) Vessels with other craft in tow will, if practicable, at once, moor them compactly along the breakwater, either taking in the towlines or placing the slack in them upon the breakwater in such a manner as not to interfere with other vessels. If necessary to moor alongside of other vessels moored to the breakwater, the towlines shall be taken in or disposed of in such a manner as not to interfere with the departure of vessels moored between them and the breakwater.

(g) Vessels of every description mooring to the breakwater, must place suitable fenders between themselves and the breakwater to protect the timber wailings on the breakwater from damage.

(h) The unloading of freight of any class upon the breakwater is expressly prohibited, except in accordance with special permission from the said District Engineer or his representative.

(i) Each and every vessel made fast to the breakwater, or anchored in the harbor without a line made fast to the shore or shore dock, must have at least one experienced person upon it during the entire time said vessel is thus moored in the harbor.

§ 207.611 St. Lawrence River from Tibbetts Point to Raquette River, excluding the section between Eisenhower Lock and Snell Lock, N.Y.; use, administration and navigation in U.S. waters. [Revoked and reserved]

PART 401—SEAWAY REGULATIONS AND RULES

The Saint Lawrence Seaway Development Corp., a corporate agency of the United States, created by Public Law 358, 83d Congress, approved May 13, 1954 (68 Stat. 92; 33 U.S.C. 981 et seq.) and the St. Lawrence Seaway Authority of Canada issue joint regulations covering vessels and persons using the St. Lawrence Seaway. Within the U.S. waters of the St. Lawrence Seaway, vessel traffic management functions are the responsibility of the Saint Lawrence Seaway Development Corporation. The Saint Lawrence Seaway Development Corporation's regulations (called "Seaway Regulations and Rules") are codified in Title 33, Code of Federal Regulations, Part 401. Amendments are published in the Federal Register and mimeographed copies of the regulations as amended are produced each year and are available at the St. Lawrence Seaway Corporation's Massena, N.Y. 13662 (315/764-0271) offices, at a nominal charge.

The St. Lawrence Seaway Authority and the Saint Lawrence Seaway Development Corporation jointly publish the Seaway Handbook, which may be obtained in French or English versions from the Information Canada, Ottawa, Canada (Price $7.50 Canadian funds) or from the Saint Lawrence Seaway Development Corporation, Massena, N.Y., at a cost of $5.00 per copy (which includes binder and two years' amendment service from date of purchase).

Under Section 401.94 of the Seaway Regulations, a copy of the Seaway Regulations shall be kept on board every vessel while in transit in the Seaway.

Title 36—Parks, Forests, and Memorials

Chapter I—National Park Service, Department of the Interior

PART 1—MISCELLANEOUS PROVISIONS

* * *

§ 1.1 Applicability and scope.

(a) The regulations contained in Parts 1 through 6 of this chapter shall apply to all persons entering, using, visiting, or who are otherwise within the boundaries of any federally owned or controlled areas administered by the National Park Service, except: (1) Areas administered by the National Park Service in the District of Columbia and its environs to which Part 50 is specifically applicable, and (2) national cemeteries to which Part 12 is specifically applicable. The special regulations in Part 7 of this chapter also apply to all persons entering, using or visiting the areas for which they are adopted. The regulations contained in Parts 1 through 7 of this chapter are hereby made and prescribed for the proper use, management, government and protection of, and maintenance of good order in the areas to which they apply.

* * *

§ 1.3 Penalties.

* * *

(c) Any person convicted of violating any provision of the regulations contained in Parts 1 through 7 of this chapter, or as the same may be amended or supplemented within any park area established pursuant to the Act of August 21, 1935 (49 Stat. 666), shall be punished by a fine of not more than $500 and shall be adjudged to pay all costs of the proceedings. (16 U.S.C. 462)

PART 2—PUBLIC USE AND RECREATION

* * *

§ 2.2 Aircraft.

(a) The operation or use of aircraft on lands or waters other than at the landing areas designated in special regulations is prohibited. Where a water surface is designated as a landing area, the operation or use of aircraft

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on the water within 500 feet of bathing beaches, boat docks, floats, piers, ramps, or within 1 mile of water control structures, except as otherwise provided by special regulations, is prohibited.

(b) Except in extreme emergencies involving the safety of human life or threat of serious property loss, the air delivery of any person or thing by parachute, helicopter, or other means without prior written permission of the Superintendent is prohibited.

(c) The provisions of this section shall not be applicable to aircraft engaged on official business of the Federal Government, or used in emergency rescue in accordance with the directions of the Superintendent, or forced to land due to circumstances beyond the control of the operator.

* * *

PART 7—SPECIAL REGULATIONS RELATING TO PARKS AND MONUMENTS

* * *

§ 7.38 Isle Royale National Park.

(a) *Aircraft; designated landing areas.*

(1) The portion of Tobin Harbor located in the NE¼ of sec. 4, T. 66 N., R. 33 W.; the SE¼ of sec. 33, T. 67 N., R. 33 W.; and the SW¼ of sec. 34, T. 67 N., R. 33 W.

(2) The portion of Rock Harbor located in the SE¼ of sec. 13, the N½ of sec. 24, T. 66 N., R. 34 W., and the W½ of sec. 18, T. 66 N., R. 33 W.

(3) The portion of Washington Harbor located in the N½ of sec. 32, all of sec. 29, SE¼ of sec. 30, and the E½ of sec. 31, T. 64 N., R. 38 W.

(b) *Underwater diving.* No person shall undertake diving in the waters of Isle Royale National Park with the aid of underwater breathing apparatus without first registering with the Superintendent.

(c) *Dogs, cats, and other pets.* (1) Dogs, cats, and other pets are prohibited in concessioner operated facilities, in campsites not accessible by boat from Lake Superior, and on trails more than one quarter mile from campsites accessible by boat from Lake Superior.

(2) Dogs, cats, and other pets shall not be left unattended at any time.

Title 40—Protection of Environment

Chapter I—Environmental Protection Agency

PART 140—MARINE SANITATION DEVICE STANDARD

Standards of Performance

Initial standards and regulations promulgated under section 13 of the Act preempt any statute or regulation of a State or political subdivision with respect to the design, manufacture, or installation or use of any marine sanitation device on any vessel subject to section 13. However, such preemption does not take place until the effective date of the initial standards and regulations, including the regulations to be promulgated by the Secretary of Transportation. In accordance with section 13, this regulation becomes effective for new vessels 2 years after promulgation of the regulations by the Secretary of Transportation and for existing vessels 5 years after such promulgation.

It should be noted that, in accordance with section 13 of the Act, these standards apply only to navigable waters of the United States. Many inland lakes and rivers do not connect with bodies of water used in interstate commerce and hence are not part of the navigable waters of the United States. Consequently, they are not covered by these regulations.

Sec.
140.1 Definitions.
140.2 Scope of standard.
140.3 Standard.
140.4 Complete prohibition.
140.5 Analytical procedures.

§ 140.1 Definitions.

For the purpose of these standards the following definitions shall apply:

(a) "Sewage" means human body wastes and the wastes from toilets and other receptacles intended to receive or retain body wastes;

(b) "Discharge" includes, but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying, or dumping;

(c) "Marine sanitation device" includes any equipment for installation on board a vessel and which is designed to receive, retain, treat, or discharge sewage, and any process to treat such sewage;

(d) "Vessel" includes every description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on the navigable waters of the United States;

(e) "New vessel" refers to any vessel on which construction was initiated on or after the date of promulgation of the standards and regulations;

(f) "Existing vessel" refers to any vessel on which construction was initiated prior to the date of promulgation of the standards and regulations;

(g) "Fecal coliform bacteria" are those organisms associated with the intestine of warm blooded animals that are commonly used to indicate the presence of fecal material and the potential presence of organisms capable of causing disease in man.

§ 140.2 Scope of standard.

The standard adopted herein applies only to vessels on which a marine toilet facility has been installed. The standard does not require the installation of a toilet facility on any vessel that is not so equipped. The standard applies to vessels owned and operated by the United States unless the Secretary of Defense finds that compliance would not be in the interest of national security.

§ 140.3 Standard.

(a) Marine sanitation devices installed on vessels covered by these regulations shall be designed and operated to prevent the overboard discharge of sewage, treated or untreated, or of any waste derived from sewage, into the navigable waters of the United States.

(b) This standard shall be effective for new vessels 2 years after initial promulgation of implementing Coast Guard regulations under section 13(b)(1) of the Act (or, in the case of vessels owned and operated by the Department of Defense, 2 years after promulgation of implementing regulations by the Secretary of Defense under section 13(d) of the Act, and for existing vessels 5 years after such promulgation.

(c) Any existing vessel equipped with a marine sanitation device which is certified by the Coast Guard as being capable of providing a degree of treatment which (1) under the conditions of the certification program to be established by the Coast Guard, will reduce fecal coliform bacteria to no more than 1,000 per 100 milliliters and prevent the discharge of an effluent with visible floating solids; and (2) is installed on or before the date of initial promulgation of implementing Coast Guard regulations under section 13(b)(1) of the Act, or within 3 years after the time of promulgation, shall not be required to comply with paragraph (a) of this section. This exemption from compliance with paragraph (a) of this section shall continue so long as the device remains operable.

(d) Any existing vessel equipped with a marine sanitation device certified as provided in paragraph (c) of this section which is installed after 3 years from the date of initial promulgation of implementing Coast Guard regulations under section 13(b)(1) of the Act, but before the effective date of paragraph (a) of this section with respect to existing vessels, shall not be required to comply with paragraph (a) of this section for 3 years following such effective date: *Provided*, That the device remains operable.

(e) The degree of treatment described in paragraph (c) of this section is an "appropriate standard" for purposes of Coast Guard and Department of Defense certification pursuant to section 13(g)(2) of the Act.

(f) This section is not to be construed to accelerate the effective date of section 13(g)(1) of the Act.

§ 140.4 Complete prohibition.

A State may make a written application to the Administrator, Environmental Protection Agency, for the issuance of a regulation completely prohibiting discharge from a vessel of any sewage (whether treated or not) into particular waters of the State, or specified portions thereof, where such waters constitute navigable waters of the United States. Such application shall specify with particularity the waters, or portions thereof, for which a complete prohibition is desired. The application shall also demonstrate that a complete prohibition is required by applicable water quality standards; and in this connection the application shall include: (a) A statement of the applicable water quality standards; and (b) justification for the belief that the discharge of sewage from vessels may contribute to a violation of water quality standards in the waters or portions thereof which are the subject of the application. If, on the basis of the State's application and any other information available to him, the Administrator is unable to make a finding that applicable water quality standards require a complete prohibition of any discharge in the waters or portions thereof covered by the application, he shall state the reasons why he cannot make such a finding, and shall deny the application. If the Administrator makes a finding that applicable water quality standards require a complete prohibition of any discharge in all or any part of the waters or portions thereof covered by the State's application, he shall publish such finding together with a notice of proposed rule making, and then shall proceed in accordance with 5 U.S.C. 553. If the Administrator's finding is that applicable water quality standards require a complete prohibition covering a more restricted or more expanded area than that applied for by the State, he shall state the reasons why his finding differs in scope from that requested in the State's application. No regulation under this section shall be issued to take effect sooner than the effective date of the initial standards and regulations issued under section 13(b)(1) of the Act.

§ 140.5 Analytical procedures.

In determining the composition and quality of effluent discharged from marine sanitation devices the procedures contained in the current "Standard Methods for the Examination of Water and Wastewater," or subsequent revisions or amendments thereto, shall be employed.

Title 46—Shipping

Regulations Requiring the Possession of Nautical Charts

Pertinent sections of the U.S. Code, Title 46, relative to vessels having charts aboard are as follows:

(a) Tanker § 35.20-1
(b) Passenger § 78.05-5
(c) Cargo § 97.05-5(a)

In general, the regulation is as follows:

All vessels, except barges, vessels operating exclusively on rivers, and motorboats other than those certificated for ocean and coastwise routes, shall have charts of the waters upon which they operate available for convenient reference at all times.

Notice

Charts of the territory embracing the United States portion of the Great Lakes and their connecting and outflow rivers, Lake Champlain, the lakes and other naturally navigable waters of the New York State Barge Canal system, the Fox River from Green Bay to and including Lake Winnebago, and the Minnesota-Ontario Border Lakes, including contiguous Canadian area are

published by NOS, NOAA. A catalog of the charts may be obtained, gratis, by directing a request to:

Distribution Division (C44)
National Ocean Survey
Riverdale, Md. 20840

Charts and Coast Pilots for the waters of the Dominion of Canada are prepared and sold by:

The Canadian Hydrographic Service
Chart Distribution Office
Dept. of the Environment
Ottawa, Ontario, Canada K1A OE6

Canadian Charts and Publications Regulations.—His Excellency the Governor General in Council, on the recommendation of the Minister of Transport, pursuant to section 400 of the Canada Shipping Act and section 739 of the Canada Shipping Act, as enacted by section 2 of an Act to Amend the Canada Shipping Act Chapter 27 of the Statutes of Canada, 1970–1971, is pleased hereby [Canada Gazette, Part II, Vol. 106, No. 15, dated 28 July, 1972] to make the annexed Regulations requiring ships to have on board, maintain and use appropriate charts, tide tables, lists of lights and other nautical publications, effective October 1st, 1972, as amended:

Regulations Requiring Ships to have on Board, Maintain, and Use Appropriate Charts, Tide Tables, Lists of Lights, and Other Nautical Publications

Short Title

1. These Regulations may be cited as the *Charts and Publications Regulations.*

Interpretation

2. In these Regulations "chart" means a nautical chart; "*Information Bulletin*", in respect of an area to be navigated by a ship, means the chart catalogue for that area published by the Canadian Hydrographic Service; "national authority" means the government of a country; "ship" includes every description of vessel used in navigation and not propelled by oars.

PART I—SHIPS IN CANADIAN WATERS AND FISHING ZONES

Application

3.(1) Subject to subsection (2), this Part applies to all self-propelled ships, other than ships of war, in

(a) Canadian waters south of the sixtieth parallel of north latitude;

(b) Canadian waters north of the sixtieth parallel of north latitude that are not within a shipping safety control zone prescribed pursuant to the *Arctic Waters Pollution Prevention Act;* and

(c) a fishing zone of Canada prescribed pursuant to the *Territorial Sea and Fishing Zones Act.*

(2) This Part does not apply to a ship that is of less than 100 tons, gross tonnage, if the person in charge of the navigation of that ship

(a) is informed of the loctaion and character of charted
 (i) shipping routes,
 (ii) lights, buoys and marks, and
 (iii) navigational hazards, and

(b) has a general knowledge of the prevailing navigational conditions

in the area in which the ship is to be navigated.

Carriage of Charts and Publications

4.(1) Every ship shall have on board, in respect of each area to be navigated by the ship, at least the latest editions of such charts and the most recent issues of such publications as are necessary for the ship to comply with sections 5 to 7.

(2) When making a voyage described in column I of an item of the schedule, every ship shall, in addition to the charts required by subsection (1), have on board

(a) the latest editions of the Canadian Hydrographic Service charts described in column II of that item; or

(b) the latest editions of the charts published by any national authority that
 (i) cover the same area as,
 (ii) are at least as complete, accurate, intelligible and up-to-date as, and
 (iii) are at a scale that is at least 75 percent of the scale of

the latest editions of the charts described in column II of that item.

Use of Charts

5.(1) Subject to subsection (2), every ship shall, in respect of the immediate area in which the ship is located, make proper navigational use of a chart that

(a) is published by a national authority;

(b) covers that immediate area; and

(c) provides a representation of the area covered by the chart that is
 (i) as complete, accurate, intelligible and up-to-date as, and
 (ii) at a scale that is at least 75 per cent of the scale of

the largest scale chart described in the most recent issue of the *Information Bulletin* that is a chart of that immediate area.

(2) Where a ship is located

(a) more than five nautical miles from any charted feature or charted depth of water that represents a potential hazard to the ship, or

(b) within the area covered by a chart described in the most recent issue of the *Information Bulletin* as a chart
 (i) primarily intended for the use of pleasure craft, or
 (ii) primarily of an anchorage, a river or a harbour that is not entered by the ship,

paragraph (1)(c) shall be deemed to refer to the second-largest scale chart of that immediate area as described in the most recent issue of the *Information Bulletin*, if that second-largest scale chart is at a scale of not less than 1:400,000 (5.486 nautical miles to the inch or 2.160 nautical miles to the centimeter).

Use of Other Publications

6.(1) Subject to subsections (2) and (3), every ship shall, in respect of each area to be navigated by the ship, make proper navigational use of

(a) the following Canadian Government publications:

(i) tide and current tables;

(ii) sailing directions;

(iii) *Lists of Lights, Buoys and Fog Signals;*

(iv) where the ship is fitted with radio equipment, *Radio Aids to Marine Navigation;*

(v) *Code of Navigation Practices and Procedures;* and

(vi) where the ship is making a voyage during which ice may be encountered, *Ice Navigation in Canadian Waters;*

(b) the *Information Bulletin;* and

(c) the annual edition of Canadian *Notices to Mariners.*

(2) A publication of any national authority may be substituted for any Canadian Government publication described in paragraph (1)(a), if the publication is, in respect of information that may affect the safe navigation of the ship in the area being navigated, as complete, accurate, intelligible and up-to-date as the Canadian Government publication.

(3) No ship need use the *List of Lights, Buoys and Fog Signals* if the information contained in that publication that may affect the safe navigation of the ship is described on the charts used by the ship.

Maintenance

7. Every ship shall ensure that any chart or publication required by this Part to be on board the ship is, before being used in the navigation of the ship, corrected up-to-date from information that may affect the safe navigation of the ship and that is contained in a notice to mariners or a radio navigation warning.

Exception

8. Notwithstanding the provisions of this Part, a ship shall be deemed not to have contravened this Part if, before the ship navigated an area for which a chart or publication is required and after the ship was informed that it would be navigating that area, it was not possible for the ship

(a) to obtain the required chart or publication at any harbour at which the ship called;

(b) to obtain safely and legally the required chart or publication at any harbour that the ship passed at such a distance that it would not have been unreasonable for the ship to obtain the chart or publication at that harbour; or

(c) to receive a radio navigation warning containing information that may have affected the safe navigation of the ship in that area.

PART II—CANADIAN SHIPS IN WATERS OTHER THAN CANADIAN WATERS OR FISHING ZONES

Application

9.(1) Subject to subsection (2), this Part applies to all self-propelled Canadian ships, other than ships of war, in waters other than

(a) Canadian waters;

(b) a shipping safety control zone prescribed pursuant to the *Arctic Waters Pollution Prevention Act;* and

(c) a fishing zone of Canada prescribed pursuant to the *Territorial Sea and Fishing Zones Act.*

(2) This Part does not apply to a ship that is of less than 100 tons, gross tonnage, if the person in charge of the navigation of that ship

(a) is informed of the location and character of charted

(i) shipping routes,

(ii) lights, buoys and marks, and

(iii) navigational hazards, and

(b) has a general knowledge of the prevailing navigational conditions

in the area in which the ship is to be navigated.

Conflict of Laws

10. In the event of any inconsistency between this Part and the laws of a country other than Canada that are applicable to a Canadian ship within iits territorial waters or fishing zones, the laws of that country prevail to the extent of the inconsistency.

Responsibility of Owner and Master

11. The owner and master of every ship to which this Part applies shall ensure that the ship complies with the requirements of this Part.

Carriage of Charts and Publications

12. Every ship shall have on board, in respect of each area to be navigated by the ship, at least the latest editions of such charts and the most recent issues of such publications as are necessary for the ship to comply with sections 13 to 16.

Use of Charts

13.(1) Subject to subsection (2), every ship shall, in respect of the immediate area in which the ship is located, make proper navigational use of a chart that

(a) is published by a national authority;

(b) covers that immediate area; and

(c) provides a representation of the area covered by the chart that is

(i) as complete, accurate, intelligible and up-to-date as, and

(ii) at a scale that is at least 75 per cent of the scale of the largest scale chart described in the chart catalogue specified in section 15 that is a chart of that immediate area,

(2) where a ship is located,

(a) more than five nautical miles from any charted feature or charted depth of water that represents a potential hazard to the ship, or

(b) within the area covered by a chart described in the chart catalogue specified in section 15 as a chart

(i) primarily intended for the use of pleasure craft, or

(ii) primarily of an anchorage, a river or a harbour that is not entered by the ship,

paragraph (1)(c) shall be deemed to refer to the second largest scale chart of that immediate area as described

in the chart catalogue specified in section 15, if that second largest scale chart is at a scale of not less than 1:400,000 (5.486 nautical miles to the inch or 2.160 nautical miles to the centimetre).

Use of Other Publications

14.(1) Subject to subsections (2) and (3), every ship shall, in respect to each area to be navigated by the ship, make proper navigational use of

(a) the following publications described in the chart catalogue specified in section 15:

(i) tide and current tables;

(ii) sailing directions;

(iii) list of lights; and

(iv) where the ship is fitted with radio equipment, list of radio aids to marine navigation;

(b) the following Canadian Government publications:

(i) the annual edition of *Notices to Mariners;*

(ii) *Code of Navigation Practices and Procedures;* and

(iii) where the ship is making a voyage during which ice may be encountered, *Ice Navigation in Canadian Waters;* and

(c) the chart catalogue specified in section 15.

(2) A publication of any national authority may be substituted for any publication described in paragraph (1)(a) and subparagraphs (1)(b)(ii) and (iii) if the publication is, in respect of information that may affect the safe navigation of the ship in the area to be navigated; as complete, accurate, intelligible and up-to-date as the publication for which it is to be substituted.

(3) No ship need use the list of lights if the information contained in that publication that may affect the safe navigation of the ship is described on the charts used by the ship.

Chart Catalogue

15. The most recent issue of the chart catalogue published by the Government of Great Britain, the United States or Canada, whichever one provides the most complete, accurate, intelligible and up-to-date navigational coverage for the territorial sea, fishing zone or region of the high sea that is to be navigated, shall be the chart catalogue used for the selection of charts and publications required by this Part.

Maintenance

16. Every ship shall ensure that any chart or publication required by this Part to be on board the ship is, before being used in the navigation of the ship, corrected up-to-date from information that may affect the safe navigation of the ship and that is contained in a notice to mariners or a radio navigation warning.

Exception

17. Notwithstanding the provisions of this Part, the owner or master of a ship shall be deemed not to have contravened this Part if, before the ship navigated an area for which a chart or publication is required and after the ship was informed that it would be navigating that area, it was not possible for the ship

(a) to obtain the required chart or publication at any harbour at which the ship called;

(b) to obtain safely and legally the required chart or publication at any harbour that the ship passed at such a distance that it would not have been unreasonable for the ship to obtain the chart or publication at that harbour; or

(c) to receive a radio navigation warning containing information that may have affected the safe navigation of the ship in that area.

Part 401—GREAT LAKES PILOTAGE REGULATIONS (TITLE 46)

(in part)

Subpart A—General

* * *

§ 401.110 Definitions.

(a) The following terms where used in this part shall have the following meanings:

(1) "Act" means the Great Lakes Pilotage Act of 1960, Public Law 86-555, 74 Stat. 239-262; 46 U.S.C. 216-2161).

(2) "Commandant" means Commandant, U.S. Coast Guard Department of Transportation, Washington, D.C. 20591.

* * *

(9) "Director" means Director, Great Lakes Pilotage Staff, on the staff of the Commander, Ninth Coast Guard District (dgp), Federal Office Building, 1240 East Ninth Street, Cleveland, Ohio 44199.

(10) Rate computation definitions:

(i) "Length" means the distance between the forward and after extremities of the ship.

(ii) "Breadth" means the maximum breadth to the outside of the shell plating of the ship.

(iii) "Depth" means the vertical distance at amidships from the top of the keel plate to the uppermost continuous deck, fore and aft, and which extends to the sides of the ship. The continuity of a deck shall not be considered to be affected by the existence of tonnage openings, engine spaces, or a step in the deck.

(11) "Person" includes an individual, registered pilot, partnership, corporation, association, voluntary association, authorized pool, or public or private organization, other than an agency.

§ 401.120 Federal Reservation of Pilotage Regulations.

No state, municipal, or other local authority shall require the use of pilots or regulate any aspect of pilotage in any of the waters specified in the Act. Only those persons registered as United States Registered Pilots or Canadian Registered Pilots as defined in this subpart may render pilotage services on any vessel subject to the Act and the Memorandum of Arrangements, Great Lakes Pilotage.

* * *

Subpart E—Penalties: Operations Without Registered Pilots

* * *

§ 401.500 Penalties for Violations.

Any person who violates any provision of this part shall be liable to the United States in a civil penalty not exceeding $500 for each violation. Such penalty may be remitted or mitigated, upon application therefor, by the Commandant upon such terms as he, in his discretion, shall think proper.

§ 401.510 Operation without Registered Pilots.

(a) A vessel may be navigated in the U.S. waters of the Great Lakes without a United States or Canadian Registered Pilot when the vessel or its cargo is in distress or jeopardy.

(b) A vessel may be navigated in the U.S. waters of the Great Lakes without a United States or Canadian Registered Pilot when the Director, with the concurrence of the Commander, 9th Coast Guard District, notifies the master that a United States or Canadian Registered Pilot is not available.

(1) Notification to the master that a pilot is not available will be made by the Director through the appropriate pilotage pool, either orally or in writing as the circumstances admit, and shall not be deemed given until the notice is actually delivered to the vessel by the pilotage pool.

(2) The determination that a pilot is not available will be made on an individual basis and only when a vessel has given proper notice of its pilotage service requirements to the pilotage pool having dispatching jurisdiction at the time. The vessel has no obligation or responsibility with respect to such notification other than properly informing the pilotage pool of its pilotage requirements. However, the failure or delay by the pool in processing a pilotage service request, or refusal or delay by the Coast Guard in notifying the vessel that a pilot is not available, does not constitute constructive notice that a pilot is not available, and the vessel is not relieved by such failure or delay from compliance with the Great Lakes Pilotage Act of 1960.

(3) Upon receipt of proper notice of a vessel's pilotage requirements, the pilotage pool shall then determine from the tour de role the availability of a pilot to render the service required. If no pilot is reasonably expected to be available for service within 6 hours of the time the pilotage services are required by the vessel, the pilotage pool shall promptly inform the Director through the U.S. Coast Guard communications system in the manner as may be prescribed from time to time by the Commandant. The Director shall be informed of:

(i) Name and flag of the vessel;
(ii) Route of vessel for which a pilot is not available;
(iii) Time elapsing before a pilot is reasonably expected to become available;
(iv) Whether vessel has an "other officer" on board;
(v) Familiarity of master with route to be transited by the vessel;
(vi) Draft of vessel; and
(vii) Any circumstance of traffic or weather, or condition of the vessel or its cargo which would adversely affect the safety of the vessel in transiting without a pilot.

(4) When a pilot is expected to become available within 6 hours of the time his services are required, the vessel shall be informed that a pilot is available and the approximate time he will report on duty. However, should any unusual circumstance or condition exist which may justify notification that a pilot is not available in less than 6 hours, the pilotage pool shall inform the Director as in subparagraph (3) of this paragraph along with the circumstances involved. Every reasonable effort is to be made to prevent delay to the vessel consistent with the intent and purpose of the Great Lakes Pilotage Act of 1960.

(5) Any vessel which requires the services of a pilot and is navigated without a pilot or proceeds prior to receipt of a message that a pilot is not available pursuant to subparagraph (1) of this paragraph shall be reported as in violation of section 7 of the Great Lakes Pilotage Act of 1960 by the pilotage pool to the local Coast Guard unit having jurisdiction. If the message is received after the vessel proceeds, such message shall not be delivered without concurrence of the Coast Guard officer to whom the violation was reported.

(6) U.S. pilotage pools informing the Director that a pilot is not available for a vessel shall also obtain notice that pilot is not available from the appropriate Canadian Supervisor of Pilots for those portions of the route which are in Canadian waters in the manner prescribed by them. The notice for Canadian District No. 1 waters shall be obtained from the Supervisor of Pilots, Department of Transport, Cornwall, Ontario, and the notice for Canadian District No. 2 waters shall be obtained from the Supervisor of Pilots, Development of Transport, Port Weller, Ontario. Authority to issue notice for Canadian waters of District No. 3 has been granted to the Director by the Department of Transport, Ottawa, and separate notice from Canada for this District is not required until such time as separate Canadian pilotage dispatch facilities may be established.

(7) Notice that a pilot is not available shall not be delivered to any vessel unless the message contains the concurrence of the Commander, 9th Coast Guard District, and notice for Canadian waters of Districts No. 1 and No. 2, if required, has been obtained from the appropriate Canadian authority.

(8) In the event of an emergency or any other compelling circumstance, the Director may issue, without the specific request for service as provided under subparagraph (2) of this paragraph, individual or general notification that a pilot or pilots are not available. Pilotage pools shall advise the Director of any condition or circumstance coming to their attention which may warrant such a determination.

* * * * *

4. ST. LAWRENCE RIVER ABOVE ST. REGIS

GENERAL DESCRIPTION

Physical Conditions.—The St. Lawrence River system above the Gulf of St. Lawrence comprises an estuary and a series of connected lakes, affording a course of water communication from the Gulf of St. Lawrence into the Great Lakes of the North American continent. The Seaway portion of the St. Lawrence River, opened in July 1958, may be divided into three sections. The lower section from Montreal, at the Jacques Cartier bridge, to the mouth of the St. Regis River is 73 miles long, entirely in Canadian territory, and is under the jurisdiction of the St. Lawrence Seaway Authority of Canada. The middle section from the mouth of the St. Regis River to the Iroquois Lock and Dam is about 36 miles long and the upper section from the Iroquois Lock and Dam to Tibbetts Point is about 80 miles long. The river embraced by the middle and upper sections, separates the United States and Canada, and is under the joint navigational control of The St. Lawrence Seaway Development Corp., a corporate agency of the United States, and The St. Lawrence Seaway Authority of Canada.

Movement Control of Vessels.—The section of the St. Lawrence River System between Montreal, Quebec, and eastern limits of Lake Ontario is divided into four navigation sectors. The vessel's movements in each sector are controlled by a traffic controller, and dispatching of vessels will be subject to his instructions. The vessel movement in the vicinity of structure is governed by navigation lights on the structures; further information is contained in the pamphlet "Vessel Transit Information Booklet", available from the St. Lawrence Seaway Authority of Canada, 202 Pitt St., Cornwall, Ont. or Office of Communications, St. Lawrence Seaway Development Corp., Box 520 Massena, N.Y. 13662.

The limits of these four sectors are defined in the "Seaway Handbook" (See **33 C.F.R. Part 401**—Seaway Regulations and Rules of Rules and Regulations, preceding.) along with the assigned frequency to be maintained in each section, call-in points, and the message content.

The objective of the traffic control is to provide: a safer and more efficient scheduling of vessel traffic, an efficient search and rescue coverage, information regarding pilot requirements to the appropriate Pilotage despatch centres, general marine weather broadcasts, and vessel location information to the Trade and the public through Information Centres at St. Catharines, Ontario, and Montreal, Quebec.

There are two Traffic Control Centres controlling marine traffic in the area, these are:

(1) St. Lambert Traffic Control Centre operated by the St. Lawrence Seaway Authority with radio stations located at Beauharnois Locks, Quebec, and Iroquois Lock, Ontario.

(2) Eisenhower Traffic Control Centre operated by the Saint Lawrence Seaway Development Corporation with radio stations located at Eisenhower Lock, N.Y., and Clayton, N.Y.

NOTE: These stations are continuously attended during the navigation season.

Speed Restrictions.—Maximum speed for all vessels moving in the Beauharnois Canal to Lake St. Francis (Buoy 27F) is 10 miles per hour (8.6 knots), upbound, and 12 miles per hour (10.4 knots), downbound, over the bottom and in any other canal 7 miles per hour over the bottom.

The reach from the Upper Entrance South Shore Canal, Quebec to Tibbetts Point, N.Y. is a controlled speed area:

(1) The speed limits in the U.S. Waters are in accordance with **33 C.F.R., part 401** of Rules and Regulations, preceding.

(2) The maximum speeds for vessels in excess of 40 feet in length are in effect in the following areas unless otherwise indicated thru Seaway Notices: Upper Entrance South Shore Canal to Lake St. Louis (Buoy 13A), 12 m.p.h. (10.4 knots); Lake St. Louis (Buoy 13A) to Lower Entrance Beauharnois Lock, 18 m.p.h. (15.5 knots); Upper Entrance Beauharnois Lock to Lake St. Francis (Buoy 27F), 10 m.p.h. (8.6 knots) upbound and 12 m.p.h. (10.4 knots) downbound; Lake St. Francis (Buoy 27F) to Lake St. Francis (Buoy 87F), 18 m.p.h. (15.5 knots); Lake St. Francis (Buoy 87F) to Snell Lock, 10 m.p.h. (8.6 knots) upbound, and 12 m.p.h. (10.4 knots) downbound; Snell Lock to Eisenhower Lock, 7 m.p.h. (6.1 knots); Eisenhower Lock to Richards Point (Light 55), 13 m.p.h. (11.3 knots); Richards Point (Light 55) to Morrisburg (Buoy 84), 15 m.p.h. (13 knots); Morrisburg (Buoy 84) to Ogden Island (Buoy 99), 13 m.p.h. (11.3 knots); Ogden Island (Buoy 99) to Blind Bay (½ mile east of Light 162), 15 m.p.h. (13 knots); Blind Bay (½ mile east of Light 162) to Deer Island (Light 186), 13 m.p.h. (11.3 knots); Deer Island (Light 186) to Bartlett Point (Light 227), 10 m.p.h. (8.6 knots) upbound and 12 m.p.h. (10.4 knots) downbound; Bartlett Point (Light 227) to Tibbetts Point, 15 m.p.h. (13 knots); junction of Canadian Middle Channel and Main Channel abreast of Ironsides Island to open waters between Wolfe and Howe Islands through the said Middle Channel, 11 m.p.h. (9.6 knots); Lock 1, Welland Canal to Outer Piers, Port Weller Harbor, 9 m.p.h. (7.7 knots); Port Robinson to

Ramey's Bend through the Welland By-Pass, 9 m.p.h. (7.7 knots); all other canals, 7 m.p.h. (6.1 knots).

Anchoring of Vessels.—Cautionary Notice.—When coming to anchor vessels masters are cautioned not to foul submarine cables. Fouling cables may not only result in disrupting utility services to adjacent communities but also expose the mariner to the danger of high voltages carried by certain cables. Mariners are advised to slip the anchor rather than cut the cable if the normal practice of good seamanship fails to clear the fouled anchor. Lost gear or damaged cables should be reported to the authority having jurisdiction over the waterway.

Permissible Draft.—The maximum permissible draft in Seaway channels from Montreal to Lake Ontario is 26 feet. The main Seaway channels have a controlling depth of 27 feet and the loading, draft and speed of a vessel in transit shall be controlled by the Master according to the vessel's individual characteristics and its tendency to list or squat, so as not to strike bottom. The draft shall not in any case exceed the maximum permissible draft, which will be strictly enforced. Where a vessel's draft is in excess of the maximum permissible draft, the vessel will be delayed and the overdraft corrected before transit. The maximum permissible draft in any channel is subject to change should conditions so warrant. For current information relative to permissible drafts through the St. Lawrence Seaway, consult the latest Notices to Mariners.

Sailing Courses.—The sailing course from just above Lake St. Francis, Ont., is partly on the Canadian side of the International Boundary and partly on the United States side. The course above Lake St. Francis passes northerly of St. Regis Island and thence easterly and southerly of Cornwall Island into the Bertrand H. Snell Lock of the United States Wiley-Dondero Canal, which by-passes the powerhouses and dam of the St. Lawrence Power Project. The lift in Snell Lock varies from 44 to 46 feet. Above Snell Lock, the sailing course is in Wiley-Dondero Canal for 3.3 miles to the Dwight D. Eisenhower Lock. The lift in Eisenhower Lock varies from 38 to 42 feet. Above Eisenhower Lock, the sailing course continues in Wiley-Dondero Canal for about 6 miles before entering Lake St. Lawrence. The navigation channel follows an irregular course for about 18½ miles through Lake St. Lawrence to Iroquois Lock and Dam. The lift in Iroquois Lock varies from less than a foot to 6 feet.

Above the lock, the sailing courses are continued in channels generally to widths of 600 feet for about 11½ miles to the city of Ogdensburg. Upstream from Ogdensburg, the St. Lawrence River has an average width of one mile extending southwestward about 11 miles to the Brockville Narrows. The "Brockville Narrows", located near Brockville, Ontario, is 2.8 miles in length with a minimum channel width of 450 feet. From the Brockville Narrows the main channel widens and passes further upstream along the United States shore line and around the south side of Wellesley Island where it is again constricted to a minimum width of 450 feet through the narrows between Wellesley Island and the United States mainland, commonly known as the "American Narrows." The St. Lawrence River between Brockville, Ont., and Cape Vincent, N.Y., at the entrance to Lake Ontario, is thickly strewn with islands and shoals, large and small, known as the Thousand Islands. Generally, deep water channels run between these islands.

In the following text no effort has been made to give specific mention to all of the islands and shoals and to the winding channels and irregularities of mainland banks which characterize the stream for the greater part of its length. Mariners are referred to the charts for delineation of the intricate details of topography and hydrography.

Charts.—The National Ocean Survey publishes 13 charts, No.'s 14761–14768, and 14770–14774 that show the navigational conditions of the waterway, the location of all aids to navigation, and details of shore topography from the Cornwall Channel area just downstream from the International Boundary, to the approach to the river from Lake Ontario. The section of the river downstream from the Boundary is charted by the Canadian Hydrographic Service, 615 Booth Street, Ottawa, Ontario, Canada.

Current Velocities.—The current velocities in the St. Lawrence River are varied depending on the reach or channel. Generally, the maximum velocity in the navigation channels in the reach from Montreal, Quebec, to Prescott, Ontario, is about 4 feet per second (2.3 knots). However, in the Polly's Gut area just above the Seaway Bridge and up to the approach to Snell Lock, the velocity will average 6–7 feet per second (3.5 to 4.1 knots) at times.

The fall or slope of the river in the reach of 62 miles from Ogdensburg to the head of the river, is only one foot and the current velocities in the many channels are less than one foot per second (.6 knot).

Fluctuations of Water Surfaces.—Generally the water surfaces of the various reaches of the St. Lawrence River are fairly constant. There are some variations from the normal in the power dam area, but these are not immediately evident. Similarly, a wind blowing constantly from one direction may cause a short term fluctuation of about 2 feet either up or down.

Weather Conditions.—Fogs may occur occasionally on the St. Lawrence River, in the early part of the day, throughout the season of navigation, but the thickest weather, and the most continuous, is usually experienced in September and the first half of October, by reason of the smoke from the bush fires which usually occur during this dry season.

The temperature (Fahrenheit scale) ranges from 95 degrees in July to 30 degrees below zero in January.

The prevailing winds are west and southwest, though in the lower part of the river strong northeasterly winds are prevalent from March to June. From records of the Atmospheric Environment Service of Canada, maximum winds observed at weather stations along the shores are noted below in sequence of station, speed, direction, date.

These are sustained speeds over a one-hour period at airport locations (A) but one-minute averages at all other stations, and do not show maximum gusts which may be much higher. The speeds are in knots, with the value in miles-per-hour in brackets: Baie Comeau A. 43 (50) E, Dec. 1968; Mont Joli A 63 (72) SW, Jan. 1953; Quebec A.

Structures Across the St. Lawrence River Main Navigation Channel

No	Location and name	Kind	Miles above Quebec Bridge	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Quebec Bridge	Highway and Railroad.	0			760		150	Cantilever. 1,800-foot river span.
1A	Trois-Rivieres Bridge	Highway	74. 5					150	High level.
2	Jacques Cartier Bridge	Highway	152. 0			200		120	200 feet between abutments.
2A	Aerial cable	Electric	153. 7					210	
3	St. Lambert	Lock	153. 8			80			13–20 feet lift.
4	Victoria Bridge	Highway and C.N.R. Railroad.	153. 8			80		120	Vertical lift.
5	C.N.R. Diversion Bridge	Highway and R.R.	154. 0			80		120	Vertical lift.
5A	Submerged cable	Electric	154. 5						
5B	Submerged cable	do	155. 7						
6	Champlain Bridge	Highway	155. 8			300		120	Fixed.
6A	Submerged cable	Electric	156. 6						
6B	Submerged cable	do	157. 2						
6C	Submerged cable	do	158. 0						
6D	Submerged cable	do	161. 0						
7	Cote Ste. Catherine	Lock	162. 2			80			33–35 feet lift.
8	Cote Ste. Catherine Bridge.	Highway	162. 3			80			Rolling lift.
8A	Aerial cable	Electric	164. 9					120	
8B	Aerial cable	do	165. 3					120	
9	Honore Mercier Bridge	Highway	166. 9			250		120	Fixed.
9A	Aerial cable	Electric	167. 0					120	
10	Canadian Pacific Railway Bridge.	Railway	167. 1			250		120	Vertical lift.
11	Lower Beauharnois	Lock	182. 2			80			38–42 feet lift.
11A	Aerial cable	Electric	182. 3					120	
11B	Aerial cable	do	182. 7					120	
12	Upper Beauharnois	Lock	183. 2			80			36–40 feet lift.
13	Penn Central (New York Central) Bridge.	Railway	183. 3			80			Bob-tail Swing.
14	St. Louis Bridge	Highway & C.N.R. R.R.	189. 4			180		120	Vertical lift.
15	Valleyfield Bridge	Highway & R.R.	195. 1			180		120	Vertical lift.
15A	Submerged cable (Renshaw Is.-Stanley Is.)	Electric	221. 5						
15B	Submerged cable (Cornwall Is.-St. Regis Is.)	Electric	228. 2						
16	Seaway International Bridge.	Highway	231. 7			600		122	Suspension.
17	Bertrand H. Snell	Lock	233. 5			80			45–49 feet lift.
18	Aerial cables	Electric	234. 6					140	
19	Dwight D. Eisenhower	Lock	237. 1			80			38–42 feet lift.

Structures Across the St. Lawrence River Main Navigation Channel—Continued

No.	Location and name	Kind	Miles above Quebec Bridge	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
20	Iroquois Lock Bridge	Highway	262. 3						Rolling lift.
21	Iroquois	Lock	262. 4			80			0.5-6 feet lift.
22	Ogdensburg-Prescott Bridge.	Highway	272. 3			1, 150		129	Suspension.
24	Submerged cables (Ogdensburg-Prescott area.)		275. 9						
24A	Submerged cables (Ponemah Is.-Jorstadt Is.)	Electric	298. 6						On natural bottom.
25	Submerged cable (Pt. Marguerite to Sport Is.)		305. 4						
25A	Submerged cable (Dingman Pt.-Summerman Isl.-Lotus Is.)	Telephone	305. 5						N.Y. Telephone Co. On natural bottom.
25B	Submerged cable (Dingman Pt.-Summerman Is.)	Telephone	305. 5						Do.
25C	Submerged cable (Dingman Pt.-Ina Is.)	Telephone	305. 7						Do.
26	Submerged cable (Alexandria-Wellesley Is.)		308. 0						
26A	Submerged cable (Alex. Bay-Wellesley Is.)	Telephone	308. 2						
27	Submerged cable (Cherry Is.-Wellesley Is.).		308. 6						Abandoned.
28	Submerged cable (N.Y.-Wellesley Is.).		308. 7						
29	Submerged cable (St. Lawrence Pk.-Wellesley Is.).		310. 5						
30	Submerged cable (Collins Landing-Wellesley Is.).		311. 8						
31	Thousand Islands Bridge	Highway	311. 9			800		152	Suspension.
32	Submerged cable (N.Y.-Wellesley Is.).		312. 0						
33	Submerged cable (Clayton-Calumet Is.)	Telephone	318. 8						N.Y. Telephone Co. On natural bottom.
34	Ferry	Automobile.	334. 4						Cape Vincent-Wolfe Island.
35	Submerged cable (Cape Vincent-Alexandria Pt.).		334. 5						
36	Submerged cable (West of Cape Vincent to Alexandria Pt.).		334. 8						

59 (68) NE, Dec. 1917; Montreal Int. A. 44 (51) SW, Jan. 1972; Cornwall (Ont. Hydro) 34 (39) SW, May 1964; Kingston (Marine) 43 (50) SW, Feb. 1967.

The river seldom, if ever, freezes across below Quebec, but it is almost filled with ice that fluctuates with wind and tidal stream from shore to shore.

Above Quebec, ice bridges form and jams occur, with stretches of open water between, in which the floating ice, carried down stream by the current from the upper reaches of the river, accumulates, forcing the water to rise and back up. Canadian Ministry of Transport ice breakers are employed to combat these ice-jams as soon as the ice forms on the river, breaking and maintaining a channel between Quebec and Montreal. This operation reduces the possibility of flooding in low-lying areas bordering the river, as well as tending toward an earlier opening of the ship channel by allowing the loose ice to be carried away downstream.

Lock Dimensions

Usable Dimensions of Locks

Length	730 feet
Width	76 feet
Depth over sills	26 feet minimum

Limiting Headroom Under Transmission Lines

Wiley-Dondero Ship Canal crossing.. 140 feet minimum

Maximum Vessel Dimensions.—Every vessel that does not exceed 730 feet in overall length and 76 feet extreme breadth may transit during the navigation season. See also Permissible Draft, this chapter, preceding.

Navigation Regulations.—See 33 U.S.C. 1, published in Certain Laws, preceding, and 33 C.F.R., Part 401 of Rules and Regulations, preceding.

Seaway Regulations.—See 33 C.F.R., Part 401 (Reference) of Rules and Regulations, preceding.

Pilotage Regulations.—See 46 U.S.C. 216-216i published in Certain Laws, preceding, and 46 C.F.R. § 401 (in part) of Rules and Regulations, preceding.

Pilot Dispatch Offices.—The St. Lawrence River and Lake Ontario are serviced by the following dispatch offices:

Laurentian Pilotage Authority
1080 Beaver Hall Hill
Room 1806
Montreal 128, Quebec, Canada
(514) 283-6322

Great Lakes Pilotage Authority, Ltd.
P.O. Box 95
Cornwall, Ontario, Canada
(613) 933-2991

Great Lakes Pilotage Authority, Ltd.
P.O. Box 2008, Station B
St. Catherines, Ontario, Canada
(416) 934-2921

Oceangoing vessels entering the St. Lawrence River from sea make arrangements for pilotage service in advance through ships' agent to Laurentian Pilotage Authority. For vessels already on the Great Lakes requiring pilotage service, the nearest dispatch office is notified 12 hours ahead with a follow-up confirmation 4 hours in advance.

St. Lawrence Seaway Tolls.—Schedule of tolls may be obtained from the Saint Lawrence Seaway Development Corp., Box 520, Massena, New York 13662 or The St. Lawrence Seaway Authority, Tower A, Place De Ville, 320 Queen Street, Ottawa, Ontario, Canada K1R 5A3. In addition, the tolls are contained in the Seaway Handbook, issued jointly by the above entities.

LOCAL DESCRIPTIONS, FROM ST. REGIS TO TIBBETTS POINT

Low Water Datum.—Summerstown, Ont. to Snell Lock.—Project depths and soundings are referred to the sloping surface of the river when the gage at Summerstown, Ont. reads 151.4 feet and the gage at Pollys Gut reads 152.8 feet. Summerstown is about 6.3 miles east-northeast of Cornwall Island. Pollys Gut is just below the Snell Lock. Both elevations are above mean water level at Pointe-au-Pere (Father Point), Quebec, on International Great Lakes Datum (1955).

Chart 14761.—The main vessel course in this section of the river passes northerly of St. Regis Island, Quebec and thence easterly and southerly of Cornwall Island, Ontario before entering the Wiley-Dondero Canal. However, there is a dredged channel northerly of Cornwall Island providing least width of 425 feet and least depth of 29 feet terminating at a point near the center of the city of Cornwall, Ontario. The Cornwall Canal was permanently closed to navigation on 30 November 1968.

Submerged Pipeline.—A submerged pipeline commences on the shoreline 3,900 feet 268° from Farlinger Point, Ont., and extends 2,000 feet 180° to an outfall in about 26 feet of water. The pipeline is marked with a buoy.

Cornwall, Ont.—Situated on the north bank of the St. Lawrence River, about 71 miles above Montreal, Cornwall is a station of the Canadian National and Canadian Pacific Railways. A Government wharf, situated about 500 feet downstream from Lock 15 of the former Cornwall Canal, in front of the Cornwall Industrial Developments, Ltd. plant, is 575 feet long with a depth of 35 feet alongside reported in May 1977. There is a transit shed on the wharf and a pipeline and tanks for unloading liquid bulk cargo adjacent. This facility is operated by Valley Terminals and Stevedoring.

Intake Crib.—A submerged intake crib with 16 feet over and marked by a buoy, is located about 20 feet north of the dredged channel, and approximately 8,200 feet 275° from Cornwall Island Front Range Light.

The St. Lawrence River vessel course in this section continues through the river from Lake St. Francis, around the north side of St. Regis Island, Ont., and then between the westerly end of St. Regis and the easterly end of Cornwall Island. The vessel course now comes into the United States waters for the first time, and as it does in most of the connecting rivers of the Great Lakes, follows a deep

water course through the river without regard to the International Boundary.

The course continues through the South Cornwall Channel along the south shore of Cornwall Island, passing under the high level Seaway International Bridge, and thence about 1¾ miles to the Snell Lock at the east end of the Wiley-Dondero Canal.

On the southeasterly side of Cornwall Island, the mouth of the **Raquette River** is very evident on the New York shore. This river has more than 12 feet of water right at the outlet into the St. Lawrence River, but shoals rapidly to 2 feet of water with numerous small islands and a submerged crib within ¾ mile upstream from the mouth.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake of the General Motors Corp., Massena, New York, starts at a point 1,850 feet 110° from the midpoint of the Seaway International Bridge, extends from the New York shore northerly into the river approximately 200 feet 000° to a crib having 10 feet of water over it. The intake crib is marked with a buoy located 2,050 feet 189.5° from light (14) on Cornwall Island.

The Reynolds Metals Company has a potable water intake about ¾ mile westerly of the Seaway International Bridge. The intake pipeline extends about 300 feet offshore, terminating in an unmarked crib, about 100 feet south of the channel edge with a least depth over the crib of 26 feet.

Grass River, N.Y. enters the St. Lawrence River from the south near the foot of the Wiley-Dondero Canal. The head of navigation on the Grass River is in the vicinity of the junction of the Massena Canal and the Grass River, and about 6¼ miles from its mouth. An examination in 1964 disclosed numerous boulders in the river channel in the vicinity of the junction.

There are three bridges across the Grass River below its junction with the Massena Canal. One, located at Massena Center, about 2¾ miles below the junction, is a highway suspension bridge 400 feet long, with 51 feet headroom at low water. A second bridge, located about 2¼ miles below the junction is a highway bridge, having a river span of 130 feet between piers with a clear height of 39 feet at low water. The other, located a short distance below the junction and about 6 miles above the mouth of the river, is a truss bridge, having a river span 450 feet long between piers, with headroom at the middle of the span of 50 feet above low water level. Rocks in the vicinity of this bridge make navigation hazardous.

Wiley-Dondero Canal, N.Y.—The Wiley-Dondero Canal has been dredged through the United States mainland starting just west of the Grass River mouth and extending through the **Long Sault Island** and Croil Islands areas. To accomplish the rise from the river below the dams to Lake St. Lawrence above the dams, the channel passes through two locks.

The **Bertrand H. Snell Lock,** at the lower end of the canal, is about 3⅜ miles below the Eisenhower Lock, and has a normal lift of 45 to 49 feet. The **Dwight D. Eisenhower Lock,** which is the upper lock is about 5 miles below the Croil Islands and has a normal lift of 38 to 42 feet. A highway tunnel extends under the Eisenhower Lock. Except through the locks which have a usable length of 730 feet and a usable width of 75 feet 6 inches, a 442-foot bottom width channel is available through the canal. The edges of the canal are well marked with buoys and lights as are the guide walls at both ends of each of the locks.

Speed Restriction.—Vessels are restricted to a maximum speed of 7 miles per hour in the Wiley-Dondero Canal reach between the Snell Lock and the Eisenhower Lock.

Low Water Datum.—Eisenhower Lock to Iroquois Dam.—Project depths and soundings are referred to the sloping surface of the river when the gage above the Eisenhower Lock reads 237.5 feet and the gage below Iroquois Lock reads 239.7 feet, both elevations are above mean water level at Pointe-au-Pere (Father Point), Quebec, on International Great Lakes Datum (1955).

Small Craft Standby Areas.—Small boat operators are informed that a small white buoy with a sign "Small Boats—Standby Area" has been placed at each of the following locations:

(a) On the South Side of the channel above Snell Lock between Light 25 and Snell Lock.

(b) Downstream of Eisenhower Lock between Buoy 33 and Eisenhower Lock.

Small boat operators are requested to lay-to around these designated areas while waiting to transit the locks.

Mooring cells have been placed clear of the channel along the south edge as follows: 13,000 feet below the Eisenhower Lock and marked with lights (A) and (B); 6,000 feet below the Eisenhower Lock and marked with a light (C) and Light 31; 8,000 feet upstream from the Eisenhower Lock, and marked with a light (D) and Light 41. There is no catwalk on this set of mooring cells.

The Moses-Saunders Power Dam and powerhouses of the St. Lawrence power project stretch from the eastern end of Barnhart Island, New York, across the international boundary northeast to the Canadian shore, being half in the United States and half in Canada. The powerhouses, with an overall length of 3,300 feet, are 3 miles northeast of the Eisenhower lock.

Long Sault Dam is located about 1¼ miles north of the Eisenhower Lock and just below the foot of Long Sault Island. One end of the 2,960 foot long dam is on the New York State mainland and the other end is on Barnhart Island, N.Y. There are thirty 50-foot wide vertical gates in the concrete-gravity curved-axis spillway structure. Eighteen of these lift gates are operated by fixed hoists of 175-ton capacity each and the remaining 12 are operated by traveling cranes on the deck.

Massena Canal and St. Lawrence River near its Head.—The head of the Massena Canal, abandoned as a power canal, is situated on the south shore about 4 miles above the Eisenhower Lock, near the head of Long Sault Island. No boating facilities exist to allow entrance or exit from the canal around the intake dam at the St. Lawrence River end or at the Powerhouse structure at the Grass River end.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The city of Massena has a submerged intake located in the face of the Massena Canal intake dam with 58 feet of water over the intake.

The length of the canal from the St. Lawrence River to the terminus at **Massena, New York,** on the Grass River, is about 2¾ miles. It is 210 feet wide at the water line and 20 feet or more deep. There is no access to this canal for boaters.

There are three bridges and a dam across the canal. Vehicular traffic is routed over a highway constructed along the crest of the Massena Intake Dam which regulates the flow from the power pool into the Massena Canal.

Chart 14762.—Coming out of the Wiley-Dondero Canal between the Croil Islands and the New York State mainland, the course turns southerly at light (57), about ¾ mile northeast of **Cat Island** (a very small island) and passes south of the island and **Cat Island Shoal,** marked on the south side by a light (58) and a buoy (60). **Steen Island** (another very small island) lies to the west of Cat Island on the north side of the course, the shoal area extending south of Steen Island being marked on the southerly side by a buoy. The course then passes north of **Wilson Hill** on the Wilson Hill ranges of 248.7° (upbound), with a buoy (61) on the most northeasterly shoal off Wilson Hill Island. A light (63), just above the buoy (61), is the only permanent navigation aid in the vicinity of Wilson Hill Island. The **Bradford Islands,** just above **Wilson Hill Island,** are marked at their most northerly point with a light (71). The northerly edge of the channel between Wilson Hill and Bradford Islands is marked with a buoy (68) on the southeasterly edge of **Weaver Shoal** and a light (70) on the southwesterly edge of the same shoal. Between buoy (68) and buoy (72), the course is on the Weaver Shoal Range of 262°15′. The concrete base of former light (68) at 44°55′56″ N., 75°04′09″ W. has 3 feet of water over it and is not marked.

Ingleside, Ont., is situated about midway between Cornwall and Morrisburg. A scenic route, the Long Sault Parkway, extends from Long Sault on the mainland opposite Mille Roches Island, across a number of bridged islands in the St. Lawrence River and is bridged over to the mainland again at Ingleside.

Pipelines.—A submerged pipeline starts on the shoreline 5,300 feet 120° from the tank at Ingleside and extends 2,900 feet 177° into about 30 feet of water. The pipeline is not marked.

A submerged pipeline starts on the east shoreline of Farran Pt., 5,950 feet 184° from the tank at Ingleside, and extends 1,200 feet 193° into 38 feet of water. The pipeline is not marked.

Anchorage Area.—The Weaver Shoal Anchorage area is located north of the vessel channel, opposite Wilson Hill Island and between Steen Island and Cat Island Shoal on the east and Weaver Shoal on the west. It is marked with anchorage buoys only at the northwesterly limits. Mariners are cautioned against anchoring in the vicinity of an unmarked wreck in position 44°56′02″ N., 75°03′42″ W., minimum depth 47 feet, to avoid fouling their anchors.

The turn in the channel abreast of the Bradford Islands is marked on the north edge with a buoy (72) and on the south edge where the course passes north of **Crysler Shoal** with a buoy (73). The north side of the channel west of Crysler Shoal is at the edge of a shoal extending from the Ontario shore, and is marked with a lighted buoy (74). A submerged crib with 7 feet of water over it, the submerged portion of the concrete pier of former light (74), is located at 44°55′26″ N., 75°06′34″ W.

Wreck.—The 349-foot **Eastcliffe Hall** struck in the area of Crysler Shoal about 3:00 a.m., 14 July 1970, and sank. Removal of the cargo and ship's hull was completed to a depth of 34 feet in December 1970.

The route now follows around the north side of **Goose Neck Island Shoals** on the Goose Neck Island Shoals Range of 255° and then turns into the southwest to follow along the Canadian shore. A light (75) and a buoy (77) are on the south side of the channel north of Goose Neck Island Shoals and a buoy (78) is on north edge of the turn into the southwest into the Doran Shoal Range of 040°10′. The west side of Goose Neck Island Shoals, and a submerged crib with a least depth of 1 foot over it, are marked with a buoy (79). Continuing on, the route lies between **Doran Shoal** and its light (81), and a light (82) at the edge of deep water off Doran Point and southeast of **Broder Island.**

A change of course to the Ogden Island ranges of 237.3°, carries along the north shore with a bouy (85) to the south of the channel abreast of the **Murphy Islands,** a buoy (87) at **Murphy Shoal,** and a buoy (89) at **Clark Island Shoal.**

Morrisburg, Ont., is a town situated about 21 miles below Ogdensburg and is on the north shore opposite the main vessel course. There is an L-shaped Government wharf of timber crib construction with a headblock 16 feet by 90 feet by 108 feet and with about 9 feet of water alongside in 1975.

Anchorage Area.—The Morrisburg Anchorage Area is located north of the vessel channel, in front of Morrisburg, between **Nash Creek** and **Canada Island.** It is marked with anchorage buoys on the western, northern, and eastern sides. Mariners are cautioned to proceed from the anchorage area within the limits marked by the buoys. Some shoal areas exist outside the marked area.

Intake Crib.—An intake crib with 33 feet over it lies adjacent to the west end of the above anchorage area, being about 300 feet from shore and 1,300 feet 233° from the Government wharf.

Buoy (89) is northwest of **Clark Island Shoal,** and the well lighted and buoyed improved main vessel channel now follows close to the Ontario shoreline around the north side of Ogden Island and continues into the southwest to the downstream end of the Iroquois Lock and Dam area.

Waddington, N.Y., is a village situated about 19 miles below Ogdensburg, southeast of **Ogden Island** on the chan-

nel of the St. Lawrence River known as **Little River.** About ¼ mile below the mouth of **Great Sucker Brook,** there is a wharf with approaches from the main channel at Canada Island, or through the Little River. In May 1977, depths of 27 feet were reported alongside the wharf.

Aerial Cable.—An aerial power cable with a clearance of 23 feet extends from light (96) north of Ogden Island, in a 322° direction to the shore.

Submerged Crib.—A submerged crib with least depth of 10 feet is located approximately 500 feet south of the vessel channel, in the vicinity of buoy (103), in position 44°51′09″ N., 75°16′06″ W.

Chart 14763.—Iroquois, Ont., about 13 miles below Ogdensburg, is located approximately ½ mile back from the river to the northwest of the anchorage area below the dam.

Water Intake.—A submerged water intake crib with 30 feet least depth lies 1,700 feet 017° from light (110). This crib, unmarked, is about 350 feet northerly of the recommended channel limits.

Iroquois Dam is just above Iroquois, Ont., and runs from **Rockway Point** on the United States shore to **Harkness Island** on the Canadian side. The 2,700 foot long dam is a buttressed gravity structure consisting of a series of piers and sluiceways. Between the piers are 32 openings which are controlled by 32 fixed roller vertical-lift gates operated by two 350-ton gantry cranes.

Iroquois Lock.—This lock, located adjacent to the Canadian end of Iroquois Dam, provides passage for vessels around the dam. Traffic through this reach of the river is controlled by the traffic control centre located at St. Lambert.

Passage Through Dam.—Small pleasure craft may, at their own risk, pass through the portals of the dam when the gates are fully open. A minimum overhead clearance of 8½ feet is provided through sluice No. 28 for downbound passage and through sluice No. 30 for upbound passage. The piers of sluice No. 28 are painted with the standard red and black channel markings on the upstream side of the dam and the piers of sluice No. 30 are marked similarly on the downstream side of the dam. **Caution:** Although the dam is usually operated in a fully open position, some or all of the gates may be closed or partially closed without prior notice.

The Seaway Authority advises that small craft passing through the dam sluices are outside of the Authority's jurisdiction and that it is not responsible for any damage resulting from the use of these facilities.

Low Water Datum.—Iroquois Dam to Ogdensburg.—Project depths and soundings are referred to the sloping surface of the river when the gage above the Iroquois Lock reads 239.9 feet and Lake Ontario is at Low Water Datum, elevation 242.8 feet. Both elevations are above mean water level at Pointe-au-Pere (Father Point), Quebec on International Great Lakes Datum (1955).

Sparrowhawk Point Steering Light, a directional light, located 48 feet above the water on a square skeletal tower, is located near **Sparrowhawk Point, N.Y.** The light is on a bearing of 205°49′ coming out of the Iroquois Lock north end.

The vessel channel above Iroquois Lock is well marked with lights and buoys and passes south of **Toussaint Island** and light (114) thereon thence on the Galop Island ranges of 227¼° and north of **Galop Island, N.Y.** and light (123) on the Drummond Island Range of 237°.

There is a steering light on **Chimney Island** on course 221¾° upbound past Galop Island and a set of ranges on Galop Island on course 58°35′ downbound past Chimney Island.

Cardinal, Ontario, is situated on a point about 9 miles below Ogdensburg. The former Galop Canal followed a direct line passing back of the town. An older section of the canal followed the curve of the shoreline above Cardinal and passed through an intermediate lock here. Use of Galop Canal has been discontinued.

Water Intake.—A water intake crib in about 24 feet of water is located about 400 feet 151° from the stack at Cardinal. There is a depth of 24 feet over the crib and it is not marked.

Frazer Shoal.—Beginning at Cardinal, a submerged retaining wall extended along the Canadian shore about 1½ miles downstream on a line 2,000 to 1,500 feet from shore, and inclosed the Frazer Shoal. In 1970, only a series of 4-foot depths or more could be located on the line of this wall.

Radio Facility.—A marine radio station at Cardinal (call sign VDQ) is operated continuously during the navigation season.

Ice Booms.—There is an Ice Boom that runs from the shoreline of the southwesterly end of Galop Island, New York, to the south end of Lame Squaw Island, Ontario, during the non-navigation season having a 400-foot section across the navigation channel marked by lights. The connected logs forming the boom are anchored to the river bottom through a series of anchors and cables extending approximately 500 feet upstream. The Ice Boom may be opened when required for movement of vessels. There are several other Ice Booms with similar anchorages in this vicinity of the river during the non-navigation season, but not across the navigation channel; in the vicinity of Chimney Point, the area southwest of Galop Island, and from the United States mainland to Galop Island.

The entrance to the North Channel which led into the Old Galop Canal, is between **Drummond Island, Ont.,** and **Spencer Island, Ont.,** to the north of the Seaway Channel. **Chimney Point** is on the south shore just above the North Channel entrance. An international high-level fixed bridge with a clearance of 129 feet, the Ogdensburg-Prescott Bridge, connects Chimney Point, N.Y., and **Johnstown, Ontario.** The vessel course turns again just above the bridge, and passes upstream between Ogdensburg, New York, and Prescott, Ontario.

LOCAL DESCRIPTIONS FROM OGDENSBURG TO THE HEAD OF THE RIVER

Charts 14763, 14764.—The vessel course above the Ogdensburg-Prescott Bridge has generally deep water on both sides of the maintained channel upriver between the cities of Ogdensburg, New York and Prescott, Ontario and thence about 11 miles to Morristown, N.Y.

Lower Lakes Terminal.—Lower Lakes Terminal (formerly the Prescott Elevator) of the National Harbours Board is located about 2.6 miles below Prescott, Ontario, with extensive railway yards and track connections with the Canadian National and Canadian Pacific Railways. The elevator has a capacity of 5,500,000 bushels of grain and is a long narrow structure having unloading facilities on one side and loading facilities on the other.

The dock for unloading is about 1,294 feet long and 250 feet wide. In May 1977, the reported controlling depth in the slip was 27 feet.

The slip for loading is about 927 feet long and 200 feet wide. In May 1977, a reported controlling depth of 27 feet was in the slip. The approach to these slips had a least depth, in 1970, of 26 feet to the main river channel.

Chart 14764.—Ogdensburg Harbor, N.Y.—This harbor is on the St. Lawrence River, about 42 miles above the Snell Lock, or about 62 miles below Lake Ontario. The Oswegatchie River enters the St. Lawrence River near the upper limit of Ogdensburg. An extensive shoal lies between the river front of Ogdensburg and the main channel of the St. Lawrence, and the harbor may be described as a dredged improvement 1⅔ miles in length close along the front of Ogdensburg on the St. Lawrence and Oswegatchie Rivers.

Channels.—Entering from the St. Lawrence River, the upper entrance to the harbor is through a dredged channel leading to the mouth of the Oswegatchie River, thence upstream to the Lake Street highway bridge. The harbor's lower entrance is through the turning basin at the east end of the harbor and thence through the city-front channel to the mouth of the Oswegatchie River.

In 1977, the controlling depths were 19 feet at midchannel through the upper entrance channel, thence 18 feet (19 feet at midchannel) in city-front channel, thence 19 feet in the turning basin except for depths of 18 feet in the southern part. In 1963, the controlling depth was 14 feet in the Oswegatchie River to the highway bridge. Above the bridge depths are less than 4 feet for 0.3 mile to the dam.

Aids to Navigation.—A buoy, marks the westerly side of the outer end of the upper entrance channel, and another buoy marks the westerly side nearly abreast of the abandoned lighthouse. The easterly side of this channel is marked by a buoy (133), at its outer end and by a buoy about abreast of the abandoned lighthouse. A buoy also marks the junction with the city-front channel.

The outer end of the Penn Central (NYC) railroad car-ferry pier, on the westerly side of the upper entrance channel, about 800 feet northerly from the abandoned Ogdensburg Light House, was damaged by fire 25 September 1970. Toward the outer end, stubs of piles protrude slightly above the surface and are hazardous to small boats, particularly after dark. Work was completed in October 1972 to remove these hazards.

An obstruction buoy is maintained by Penn Central at the outer end of the car-ferry pier.

Buoys mark the east and the west sides of the lower basin at its outer limit.

In June 1978, dual fixed highway bridges with a design clearance of 15 feet were under construction about 0.6 mile above the upper entrance of the Oswegatchie River.

Harbor Facilities.—The Ogdensburg Bridge and Port Authority operates a modern well-equipped terminal with adequate storage and handling facilities. The dock and terminal is located at the junction of the lower basin and the lower entrance channel, and had 27 feet of water alongside the 600 foot berth in May 1977. The Port Authority has dredged an irregular-shaped area from deep water in the river to the terminal to provide an entrance channel to the terminal with about 28 feet of water. Other facilities include an elevator with a capacity of 900,000 bushels of grain, coal and oil unloading and storage docks and small craft marinas. Berthing spaces and 17 feet of water were available in 1972 near the grain elevator.

Ice Boom.—There is an Ice Boom that runs from the shoreline just above Ogdensburg, New York, to Prescott, Ontario, during non-navigation season, having a 400-foot section across the navigation channel, marked by lights. The connected logs forming the boom are anchored to the river bottom through a series of anchors and cables extending approximately 500 feet upstream. The Ice Boom may be opened when required for movement of vessels.

Cable Area.—A cable area extends from the Ogdensburg, New York, shoreline, above the entrance to the Oswegatchie River, across the St. Lawrence River to Prescott, Ontario. The area is about ½ mile wide across the river.

Outfall Pipeline.—The Diamond International Corp. has an outfall pipeline located 3,000 feet 223° from the old light house and extends 450 feet 299° from the shore. It is unmarked.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline of the city of Ogdensburg, N.Y., starts on the shoreline 1,200 feet 226° from the stack of the Diamond International Corp., and extends 300 feet 319° to an intake crib in about 20 feet of water. There is a depth of 12 feet of water over the crib and it is not marked.

Prescott Ont. is directly across the river from Ogdensburg, N.Y.

Harbor Facilities.—The F. B. Doran Ltd., wharf is at the foot of Centre and George Streets, with a depth of 10 feet alongside. Close southwest is the Ministry of Transport wharf, about 220 feet long with depths of 17 to 18 feet alongside. Adjacent to this wharf are a Canadian Coast Guard Base and buoy depot, a Canadian Customs office, and a helicopter hangar and pad. Next, the Government

wharf, about 320 feet long, with a depth of 17 to 18 feet alongside, is near the west end of the waterfront. Close west of the Government wharf is a floating dock with a diving raft.

Caution.—The testing of various aids to navigation may be heard and/or seen at the Prescott Canadian Coast Guard Base. Mariners should exercise caution in the vicinity so as not to confuse the test aids with the standard channel aids.

Submerged Intake.—A submerged pipeline extends 400 feet 163° from a point on shore at the foot of Sophia Street and terminates in a crib with 17 feet over it. This crib is marked by a buoy.

Wreck.—A wreck is located about 600 feet offshore at a point 5,100 feet 214° from the spire in Prescott. There is a depth of 4 feet of water over the wreck with 24 feet or more on the south side. The wreck is not marked. About 350 feet west of the wreck is an unmarked submerged pile with 9 feet over it and 12 to 18 feet surrounding.

Low Water Datum.—Ogdensburg to Lake Ontario.—Project depths and soundings are referred to the sloping surface of the river when the gage above the Iroquois Lock reads 239.9 feet and Lake Ontario is at Low Water Datum, elevation 242.8 feet. Both elevations are above mean water level at Pointe-au-Pere (Father Point), Quebec on International Great Lakes Datum (1955).

Water Level Broadcasts.—The St. Law. Sea. Dev. Corp. has installed radio coverage for the reach of the St. Lawrence River from Whaleback Shoal to Tibbetts Point, N.Y. The broadcasts will include water levels on Lake Ontario (Kingston, Ont., gage) and on the St. Lawrence River (Ogdensburg, N.Y., gage), serve as a reporting station for incidents affecting condition of vessels and used to broadcast seaway notices affecting navigation. The call letters are WAG at Eisenhower Lock with monitoring on 156.8 MHz at all times during the navigation season and working frequency of 156.6 MHz. Water levels will not be broadcast until the levels reach Low Water Datum and then the broadcast will be made every two hours until the levels return above Low Water Datum.

Prescott to Brockville, Ont.—The channel above Ogdensburg, New York, and Prescott, Ontario, extends about 7¼ miles 223° to a point opposite Maitland, Ont. The channel through this reach of the river is deep and wide and the course follows the center of the river, passing close to a special buoy opposite Maitland.

About two miles southwest of Prescott on the Ontario side of the river is Blue Church Bay. A submerged crib is located in 8 feet of water approximately 125 feet offshore from the northerly end of Blue Church Bay. A buoy located 9,700 feet 051° from the southerly Du Pont stack further up-stream marks the crib.

A submerged crib in about two feet of water is located about 10,450 feet 048° from the Du Pont stack farther upstream. The crib is not marked.

Outfall Pipelines.—An outfall pipeline has been constructed from a point on the Canadian shore approximately 2⅝ miles northeast of Maitland, Ont., and extending into the St. Lawrence River approximately 915 feet 114°. The end of the pipeline is located approximately 2,900 feet 100° from the Du Pont stack and is marked by a buoy.

Du Pont of Canada Ltd. has established an outfall pipeline from a point on the Canadian shore approximately 2½ miles northeast of Maitland and extending into the St. Lawrence River approximately 500 feet 115°. The end of the pipeline is located approximately 2,400 feet 110° from the Du Pont stack and is marked by a buoy.

Water Intake.—Du Pont Company of Canada Ltd. has an intake structure adjacent to the plant, about 2⅜ miles northeast of Maitland. The outer end is marked by a light.

Outfall Pipeline.—An outfall pipeline has been constructed from a point on the Canadian shore approximately 1⅜ miles northeast of Maitland and extending into the St. Lawrence River approximately 1,100 feet 124°. The end of the pipeline is located approximately 5,250 feet 205° from the Du Pont stack, and is marked by a buoy.

Water Intake.—A water intake pipeline has been constructed from a point on the Canadian shore approximately 1⅜ miles northeast of Maitland and extending into the St. Lawrence River approximately 1,300 feet 150°. The end of the pipeline, terminating in a submerged crib with 25 feet over it, is located approximately 5,925 feet 205° from the Du Pont stack, and is marked by a buoy.

After passing Maitland buoy, the course turns to 231° and extends for about 3¾ miles to the turn between McNair Island, Ont., marked on its northwesterly side by a light (137), and North McNair Shoal.

Catamaran Shoal, about 1½ miles 197° from the Maitland stone tower, or about 1,700 feet southeasterly of the vessel course, is a detached 12-foot shoal area in normally deep water about 2½ miles northeast of McNair Island, and is marked by a buoy.

North McNair Shoal lies about midway between McNair Island and the Canadian shore below Brockville, on the north side of the channel used by deep-draft vessels. The shoal is a rock ledge 100 feet long by 85 feet wide between the 18-foot contours, with a least depth of 14 feet, and is marked off its south or channel side by a buoy (136).

Charts 14764, 14770.—Morristown, N.Y., is a village situated on the south shore of the St. Lawrence River, 11 miles above Ogdensburg and nearly opposite Brockville, Ont. The landing is in a small bay, the approach to which is clear and deep.

Channels.—A dredged channel leads from the St. Lawrence River to 250 feet below the Northumberland Street highway bridge. In 1964, the controlling depth was 7 feet.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline of the village of Morristown, N.Y., starts on the shoreline 2,600 feet 250° from the tank at Morristown and extends 200 feet 305° to an intake crib in approximately 23 feet of water. The crib is not marked.

Coming out of the course above McNair Island, the vessel course runs 1⅞ miles 223° through the deep water in front of the town of Brockville, Ont., to the turn just below

Skelton Island marked by a light (138) on the southerly side. The turn at Skelton Island is into the channel through the Brockville Narrows.

Thousand Islands.—The stretch of river, between Brockville on the northeast and Cape Vincent on the southwest, is thickly strewn with islands large and small known as the Thousand Islands, with deep water channels between. No attempt is made to mention each island and/or shoal. A chart for ready reference is necessary when attempting to navigate any portion of this section.

Brockville, Ont., is a town situated on the north shore 12 miles above Ogdensburg, on the Canadian National and Canadian Pacific Railways. The water runs deep close to the shoreline and the approaches to the wharves are clear. At the wharves, the water is 8 to 20 feet deep. A light 28 feet above the water marks the southwest corner of the Government wharf.

A Government wharf and Blockhouse Island, a public park now joined to the mainland, form a boat basin whose entrance lies west of the Government wharf. The Government wharf, 467 feet long and extending westward with depths of 12 to 18 feet alongside, is located at the southwesterly end of Blockhouse Island Park; a public wharf, with mooring accommodations over a length of 345 feet and depths ranging from 3 to 10 feet, is located at the northeast end of the park basin.

Sewers.—An outfall sewer pipeline of the Brockville Water Pollution Control Plant commences on the shore 2,200 feet 012° from McNair Island Light (137) and extends 200 feet 155° into about 70 feet of water. The pipeline is not marked.

An outfall sewer pipeline commences on the shore 3,500 feet 254° from McNair Island Light (137) and extends 150 feet 140° into about 30 feet of water. The pipeline is not marked.

Sewer Outfall.—An emergency by-pass sewer of the Brockville Water Pollution Control Plant commences on the shore 3,700 feet 253° from McNair Island Light (137) and extends 700 feet 140° into about 45 feet of water. Mariners are warned to give this area a wide berth and not to anchor their vessels in the vicinity of the sewer pipe which is not marked.

Water Intakes.—A water intake pipeline of the town of Brockville is located about 150 feet west of Victoria Island. A privately maintained buoy in 42 feet of water, and located 1,400 feet 239° from Skelton Island Light (138) marks the outer end of the pipeline intake crib having 35 feet over the crib.

A water intake pipeline of the Eugene F. Phillips Cables (Ltd.), is located about 700 feet west of Victoria Island and extends about 300 feet from shore into about six feet of water. A private buoy in about eight feet of water, and located 2,100 feet 258° from Skelton Island Light (138), marks the outer end of the crib.

Brockville Narrows.—The Narrows is a partially dredged reach about 3 miles long and 425 feet wide through which the ship channel leads, extending from a short distance above Brockville to Lily Bay, Ont. The reach is through the Brock Group, a name given to a cluster of islands and adjacent shoal areas filling the river from bank to bank. The river channel south of the Brock Island group is not suitable for deep draft vessels. Small craft operators are cautioned that many shoal spots of less than 2 feet exist between the New York shore and the main ship channel in this reach.

From the turn at Skelton Island light, the course follows naturally deep water with a shoal marked by a buoy (139) on the southeast side extending about 2,500 feet northeast of Refugee Island. At Refugee Island, the well marked course changes to 226° as far as Stovin Island where the change is to 222°.

Charts 14765, 14770.—Upstream of Stovin Island, the channel passes into deeper water and a wider channel. The designated wider channel is marked off Hillcrest Point, Ont., with a buoy, while a small shoal off the east edge of the channel is also marked with a buoy. A light (147) is on the south side of the course on a small shoal about opposite Lily Bay and about 3,000 feet downstream of Cole Ferry Shoal marked by a lighted buoy (147a). The turn above Cole Ferry Shoal is on the De Watteville Island Range of lights located on the Canadian shore. The front light, at an elevation of 31 feet, is shown from a white tower with a red roof, situated on the south end of De Watteville Island. The rear light is exhibited at an elevation of 74 feet from a red skeleton tower on Hillcrest Point, 1,150 feet 036° 55′ from the front light.

The De Watteville Island Range carries between Cole Ferry and Cole Shoals. A 13 foot shoal southeast of Cole Shoal, is marked by a light (150) on the northwest side of the channel. A light (151) marks the channelward edge of shoal water off Oak Point, New York, further upstream.

Charts 14765, 14771.—At Whaleback Shoal, the course changes to 194° for about 2½ miles, passing west of a buoy (153) and east of Bay State Shoal light (156) and continuing on between various markers to the turn between light (163) on the mainland, and lighted buoy (162) off Blind Bay, New York. A tri-color range light showing red from bearing 186° to 193°, white from 193° to 195° and green from 195° to 202°, is in operation on this course.

A natural depth of water buoyed channel leads from the turn on the De Watteville Ranges at buoy (153), roughly follows the Canadian shore along the north side of Grenadier Island; joining the Canadian Middle Channel at the westerly end of Grenadier Island.

Anchorage Area.—An anchorage area is located in the river area north and west of the turn around Whaleback Shoal. The north and west limits of the area are marked with buoys. The south limit is marked with a buoy just northeast of light (156).

Oak Point, N.Y., a landing and small summer resort about 18 miles above Ogdensburg. No landings are made here by boats drawing more than 6 feet. Near the landing there are small islands and shoals which make it necessary to use care in approaching the wharf.

Blind Bay, N.Y.—This is a small inlet about 21 miles above Ogdensburg. A sign marks the entrance which is about 825 feet below light (163). There are four aerial cables with limiting vertical clearance of 30 feet over the entrance channel. In May 1977, a reported depth

of 4 feet could be carried on the north side of the bay to a small boat basin. Depths of 3 to 6 feet were reported available in the basin. Marine fuels are available.

The vessel course above Blind Bay is on a bearing of 218° for about 1⅛ miles to **Superior Shoal** and passes southeasterly of the shoals marked by a buoy (164) and northwesterly of Superior Shoal light (165). Superior Shoal is located on the south side of the channel just offshore from **Chippewa Point**, New York.

From the Superior Shoal light (165), the course extends for short distances of about one to three miles on changing headings and passes southwest across the northwest side of **Chippewa Bay, New York** and **Oak Island** at the southwesterly end of the Bay, and southeasterly of **Grenadier** Island, Ont. The course is 2⅜ miles 216° from Superior Shoal between **Jorstadt Island** with a light (168) on the south side of the island, and a buoy (167) on the southeast channel edge to the **Haskell Shoal, Ont.**, turn, Haskell Shoal buoy (173) being on the southeast side of the channel; the course change has a buoy (172) on the westerly side and extends about 2 miles 209°, passing southeast of **Empire Shoal** buoy (176) to the turn between **Third Brother Island Shoal** on the southeast side of the channel, and Sister Island Shoal light (178) on the northwest side.

Charts 14765, 14772.—The course is now about 1⅜ miles 207° to the turn between **Ironsides Island** light (179) on the southeast side, and **Ironsides Shoal** light (180) on the northwest side of the channel, the turn also being the junction point for departure from the main St. Lawrence River vessel course into the **Canadian Middle Channel (St. Lawrence).**

Charts 14765, 14766, 14772.—Continuing on course for 1⅜ miles 225° to the turn south of **Whiskey Island Shoal, New York,** marked by a light (182), the course is 1⅛ miles 228° passing northwest of the **Excelsior Island Group** and marked on **Excelsior Shoal** with a light (183).

Charts 14765, 14771.—Chippewa Bay, N.Y., is 22 miles above Ogdensburg, and included between **Chippewa Point, Cedar** and **Oak Islands,** and the American shore. There are many small islands and shoals in the bay, which is suitable for navigation by light-draft boats carrying experienced local pilots. There is a landing called **Chippewa Bay**, on the American mainland, suitable for vessels drawing 4 feet. There are no lights or fog signals at the landing. **Atlantis Island** is about ¾ mile westerly from Chippewa Bay landing and northeasterly from Oak Island.

Charts 14765, 14772.—Goose Bay, N.Y., on the south side of the St. Lawrence River bout 30 miles above Ogdensburg and about 3½ miles below Alexandria Bay, is about 2 miles in length and ¾ mile in width. The water is very shoal, the bottom being mud with rock shoals.

Middle Channel (St. Lawrence), Grenadier Island, Ont. to Howe Island, Ont.—This channel, having a least width of 300 feet and swept to 17½ feet depth by the Canadian Government, extends through the Thousand Islands on the Canadian side of the International Boundary from Grenadier Island upstream to the wide water between Wolfe and Howe Islands; it is outlined by numerous buoys and beacons.

Speed Limit.—For all transiting vessels in excess of 40 feet in length, Canadian waters of and adjacent to the Canadian Middle Channel have been designated a maximum speed over the bottom area of 11 m.p.h. (9.5 knots) upbound and downbound, unless otherwise indicated through Seaway Notices.

NOTE:—The Canadian Middle Channel is defined as the Channel which extends from the Main Ship Channel, abreast Ironsides Island, passing southward of Grenadier Island through the Raft Narrows and Fiddlers Elbow, and on to the open water between Wolfe and Howe Islands.

Charts 14766, 14772.—The **International Rift,** between Wellesley Island, N.Y., and Hill Island, Ont., is bridged by a 90-foot arch with a vertical clearance of 19.3 feet at the center and 16.3 feet at the piers. The crossing over the Canadian waters consists of a continuous truss of two 300-foot spans from **Hill Island** to **Constance Island,** a 348-foot arch span from Constance Island to **Georgina Island,** and a suspension bridge of 750-foot span and vertical clearance of 120 feet from Georgina Island to the Canadian mainland.

Charts 14766, 14772.—From Grendier Island westward, the Canadian Middle Channel through the **Raft Narrows** is followed, midway between the shores. Approximately 1,500 feet above the Thousand Islands bridge, two channels pass **Wood Island,** one to the north for upbound vessels and one to the south for downbound vessels; thence midchannel is kept between the lights on Wallace Island and Ash Island, past **Lyndoch Island Light** southwesterly to a point south of the small island group southwest of **Dumfounder Island,** then westerly to a point off the north extreme of **The Punts,** and then southwesterly past **Leek (Thwartway)** and **Bass Islands (St. Lawrence)** into the open waters between Wolfe and Howe Islands.

Rockport, Ont., is situated on the north shore of the river on the Canadian middle channel, 12 miles east of Gananoque. The old Government wharf, about 420 feet southeast of the spire and only used by pleasure craft, has a 60-foot face and 20 feet reported alongside in May 1977. The L-shaped Customs Dock, with an 85-foot southwest face and a 42-foot southeast face, had 4 to 23 feet alongside the former and 23 feet alongside the latter, reported in May 1977. A summer station of the Canadian Customs is at the inshore end of the dock. Small-craft services are available. A submarine cable extends across the Canadian Middle Channel from the point of land about ¼ mile upstream from Rockport southerly to the nearest point of **Club Island.**

Ivy Lea, Ont., formerly known as **Lansdowne Landing,** is located 8 miles east of Gananoque, and has a public wharf extending into the river some 80 feet with 6 feet of water along its face. Services, including gas, and a ramp are available at this facility.

Charts 14767, 14774.—Gananoque, Ont., is an important manufacturing town on the north shore of the St. Lawrence River, 18 miles east of Kingston, Ont., on the Canadian National Railway. In 1958 a Government wharf at the foot of Clarence Street, 470 feet long, composed of cribs and spans, was completed and a depth of 10 feet provided by dredging near the landing head. A second Government

wharf in front of the Canadian National Railway property has mooring facilities over a distance of 815 feet and a general depth of water of 12 feet. A third Government wharf at the foot of Charles Street extends into the river 105 feet and has a landing head 85 feet long. The water depth at the landing head is 11 feet. A channel from the St. Lawrence River is buoyed and affords a depth of 7 feet. The **Gananoque River** has been dredged for about ¼ mile upstream to the highway bridge. There are numerous factories along the dredged portion. A swing bridge spans the river at its mouth. The stream is about 150 feet wide, with old wooden wharves along the banks.

Charts 14768, 14802.—Kingston, Ontario.—This is the chief city of Frontenac County, situated at the division of the St. Lawrence River from Lake Ontario, and at the mouth of **Cataraqui River,** or the southern entrance to the Rideau Canal. It is a terminus of the Canadian National and Canadian Pacific Railways.

Improvement Works.—The main channel coming in from Lake Ontario to the southwest, passes to the northward of **Penitentiary and Myles Shoals,** each marked by a buoy. In May 1977, the reported controlling depth in the main channel was 16 feet.

The harbor is deep, spacious and sheltered. Wharves extend along the city front, with 27 feet reported in May 1977. Grain elevators and docks of the Canada Steamship Lines are situated on the waterfront. The Public Wharf at the foot of Brock Street extends 355 feet into the river with depths of 17 feet on the north and south faces and 20 feet on the east face reported in May 1977.

The channel into the Inner Harbor, past the bascule bridge of the **LaSalle Causeway** which crosses the Cataraqui River, had a reported controlling depth of 16 feet in May 1977. A basin in the Inner Harbor extending about 1,200 feet east and west along the north side of the causeway, with width of 400 to 600 feet, had a reported controlling depth of 19 feet in May 1977. A wharf on the east side of the basin extends 230 feet from the shore and has a frontage of 454 feet. Dredging was done to a depth of 12 feet in the approach to and along the central 220 feet of the face of the wharf, and to a depth of 10 feet at each end of the front face. **Anglin Bay,** on the west side of the Inner Harbor, had controlling depths of 7 to 13 feet in May 1976.

Bridge Hours.—The La Salle Causeway lift bridge having a horizontal clearance of 125 feet and a vertical clearance of three feet in closed position, will be raised as follows:

Pleasure Craft.—Bridge raised on signal 7:30 a.m. to 7:30 p.m. every half hour except 8:00 a.m., 12:30 p.m., 3:45 p.m. to 4:30 p.m. and 4:45 p.m. to 5:30 p.m. Bridge raised on signal only 7:30 p.m. to 7:30 a.m. (Signal 3 long and 1 short blasts).

Commercial and Official Craft.—Bridge opened on signal at all times.

NOTE.—Exception will be made during severe weather conditions when vessels requiring shelter in the Inner Harbour will be admitted as necessary.

NOTE: Times given will conform with daylight saving time when effective.

Dry Dock.—The Canadian Dredge & Dry Dock Co.'s dry dock in the inner bay, northwest of the causeway, has a length of 196 feet on blocks, width of 40 feet at bottom, 50 feet at top, and 42.5 feet at gate, and depth of 14 feet on sill.

Aids to Navigation.—A tricolored sector light, visible from the Cataraqui River entrance, is on the east side of the river at **Barriefield.** The main channel, marked by buoys, enters the river northwestward of Carruthers Shoal. Another channel, known locally as East Channel, marked by buoys, enters the river between Point Frederick and Carruthers Shoal.

Radio Facility.—A marine radio station at Kingston (Call sign VBH) is operated continuously during the navigation season.

Magnetic disturbances.—Caution.—The normal variation of the compass (1969) for the water area adjacent to Kingston Harbour, is about 11¼° west. Due to a magnetic anomaly the variation close southwest of Carruthers Shoal is as much as 30° west, and abreast the Kingston Penitentiary it is 18° east. A short distance west of the Ontario Hospital the variation is again normal. Midway between Point Frederick and Garden Island, the amount of west variation is 20°. At Simcoe Island, it is 5° west.

Extreme caution should therefore be exercised by mariners approaching or leaving Kingston Harbour in thick weather when using a magnetic compass.

Water Supply Intakes.—A disused water intake pipeline of the Kingston Waterworks commences on the shoreline at a point 8,000 feet 255° from the Penitentiary stack and extends about 2,450 feet 159° into about 63 feet of water. The pipeline is not marked.

An intake pipe of the Kingston Public Utilities extends about 1,000 feet 175° from the southwest corner of the Public Utilities (old Frontenac Coal and Wood Co.'s) wharf on the river front of Kingston with a large sign at the shore end. In 1970, a new intake pipeline was laid approximately 100 feet west of the pipeline extending from the southwest corner of the Public Utilities Wharf. This pipeline extends 2,600 feet 171° and is marked at the outer end by a buoy. Vessels should not anchor in the vicinity.

Rideau Canal or Rideau Navigation.—Connects the Ottawa River at the City of Ottawa with the eastern end of Lake Ontario at Kingston.

Length of navigation waters, 123½ miles.

Number of locks going from Ottawa to Kingston, 34 ascending and 14 descending.

Total lockage, 273 feet rise and 164 feet fall at normal levels.

Dimension of locks, 134 feet (available length 112 ft.) by 33 feet.

Depth of water on sills varies from 5 feet 9 inches on centerline of chamber to 3 feet at sides; normal navigable depth through canal reaches, 5.5 feet, minimum 5 feet.

Breadth of canal reaches bottom, 60 feet.

Breadth of canal at water surface, 80 feet.

Minimum vertical bridge clearance, 22.0 feet on Cataraqui River. (Fixed highway bridge 200 feet north of Basket Island, about 4 miles north of Kingston.) Maximum speed limit is 6 mph.

Canal vessel permits are required for passage through the Rideau Waterway locks. Information on tolls with respect to the vessel permits are promulgated in Canadian Notices to Mariners.

The summit level of the Rideau system is at upper Lake Rideau. From the summit, the route toward Ottawa follows the Rideau River, and that toward Kingston the Cataraqui River.

The **Tay Branch** of the Rideau Canal affords communication via the **Tay River** between Beveridges Bay on Lake Rideau and the town of Perth.

Length of canal, 6.12 miles.

Number of locks, 2.

Dimensions of locks, 134 feet (available length 112 feet) by 33 feet.

Total rise, 25 feet.

Depth of water on sills varies from 5 feet 9 inches on centerline of chamber to 3 feet at sides; normal navigable depth through canal reaches, 5.5 feet, minimum 5 feet.

Breadth of canal at water surface, 80 feet.

Breadth of canal at bottom, 40 feet in rock, 60 feet in clay.

Minimum vertical clearance, about 5 feet, at Beckwith Street Bridge, Perth.

Maximum speed limit 6 m.p.h.

Boat operators proposing to use the canal may contact the Superintendent, Parks Canada, 25 William Street West, Smiths Falls, Ontario K7A 1N2 Canada, for information.

Canal Regulations.—Canal regulations state that all vessels navigating the Dept. of Indian Affairs and Northern Development canals shall keep a copy of the Canal Regulations booklet on board at all times. It is available from the Rideau Canal Office.

Charts 14765, 14772, 14766. At a point west of the buoy (185), marking the south edge of the main vessel course passing the **Excelsior Group**, the course turns for ⅞ mile 217° to a point southeast of the light (186) on the southeast shore of **Deer Island.** Shoal water southeast of the channel is marked by a light (187) on a small island about 1,600 feet southeast of Deer Island.

Charts 14766, 14772.—The channel through the Upper, or **American Narrows**, which separates **Wellesley Island** from the U.S. mainland, has a minimum width of 450 feet, is generally deep and is well marked by lights and buoys.

The course changes just southeast of the light (186) on Deer Island, and carries 1⅛ miles 219° to the next turn at **Sunken Rock**, passing the downstream end of Wellesley Island and starting around the southeast side of the same island. Northwest of the isolated 3-foot shoal called **Sunken Rock**, and marked by a light (189), the course changes for one mile 214°, passing northwest of the village of Alexandria Bay, N.Y., and **Frontenac Shoal** light (192) on the northwest, to **Pullman Shoal** on the northwest side of the channel marked with a light (194). Just east of Pullman Shoal the course changes for about one mile to 219° on the Point Vivian Leading Light, passing **Cherry Island** light (195) on the southeast as well as a light (197) located approximately 600 feet northeast of **Comfort Island**, and Comfort Island, to the next turn between a light (199) on the southeast side and a light (200) marking the shallows off **Seven Isles** on the northwest side.

Westminster Park, N.Y., is a summer resort on the lower end of Wellesley Island, opposite Alexandria Bay. There formerly was a length of about 200 feet of wharves at the two landings for the park, with depths from 2 to 10 feet, but the superstructures have deteriorated and all that remains are the substructures below water.

Alexandria Bay, N.Y., is a village and a famous summer resort, situated about 33 miles above Ogdensburg and 27 miles below Cape Vincent. The wharves along the river front are easily approached from the channel. **Broadway Shoal** with 15 feet of water, about 600 feet offshore and marked by a buoy, must be avoided in making these wharves. There are small bays on both sides of the village, affording anchorage for boats drawing from 6 to 11 feet of water. Marine fuel, at dockside pumps, and service are available.

Potable Water Intake.—See **42 U.S.C. 264**, published in Certain Laws, preceding, and **21 C.F.R. § 1250.93** of Rules and Regulations, preceeding. A potable water intake crib of the village of Alexandria Bay, N.Y., is located 1,820 feet 289° from the water tank at Alexandria Bay. The crib is in about 78 feet of water with 75 feet over the intake and is not marked.

Outfall Pipeline.—An outfall pipeline for the village of Alexandria Bay extends for 1,000 feet thru the center of the yacht club basin located 4,000 feet downstream of Otter Creek and extends 155 feet into the St. Lawrence River. It is unmarked.

Coast Guard Station.—A Coast Guard station is located on Wellesley Island about ¾ mile upstream of Alexandria Bay.

The station monitors VHF-FM chanel 16 (156.80 MHz) and operates on VHF-FM channels 22 (157.10 MHz) and 12 (156.60 MHz).

Wreck.—The 640-foot Canadian M/V **Roy A. Jodrey** sank November 30, 1974. The submerged wreck is located 50 feet 132° from the Alexandria Bay Coast Guard Station. It is not a hazard to navigation.

Coming out of the turn just downstream of Seven Isles, the course is now 2¼ miles 235° passing shoal water on the south side of the channel marked by a light (203) about 1,000 feet downstream of **Point Vivian, N.Y.** A 4-foot shoal area on the south side of the channel midway between Point Vivian and St. Lawrence Park is marked with a buoy (205) while the north side of the channel at this point is marked by a light (204).

Charts 14766, 14773.—Proceeding upstream on the 235° bearing, St. Lawrence Park, N.Y., is on the southeast side of the channel, with Swan Bay on the southwest side of the Park and a light (206) directly opposite, just offshore of Wellesley Island with Brown Bay to the southwest of the

light. Just above the Swan Bay-Brown Bay area, a small island located close to the south side of the channel is marked by a light (207) and the course changes to 231° and carries for 2¾ miles passing under The Thousand Islands Bridge.

Radio Facility.—At the bridge, Seaway Vessel Traffic Control Station WAG, voice call "Seaway Clayton," operates on VHF-FM channels 16 (156.80 MHz) and 13 (156.65 MHz).

Charts 14766, 14773.—On the south side of the main vessel course about 1,500 feet above the bridge, the upper limit of a shoal area bordering the channel is marked by a light (209) while a shoal on the north side is marked by buoy (208). About ⅞ mile above the Thousand Islands Bridge, a light (210) on the north side of the channel marks the south side of Wellesley Island. **Niagara Shoal**, 1½ miles above the bridge, on the southerly side of the channel is marked by a buoy (211). Approximately ⅜ of a mile downstream of light (214), a buoy (212), marks the southern extremity of shallow water on the north side of the channel. Opposite the upper end of Wellesley Island, the Upper Narrows opens out again above the shallow water on the south marked by a buoy (213) and **Granite State Shoal** on the north marked by a light (214) and **Rock Island Reef** about 1,800 feet further up on the south side marked by a buoy (215). After passing Rock Island Reef light, the course changes for 2½ miles to 239° passing south of the buoy (216) on the shoal along the northwest side of the channel.

Fineview, N.Y., is a small settlement and summer resort on the south end of Wellesley Island near Granite State Shoal Light. The dock is only suitable for skiffs as there are many rocks off the end. The reported depth alongside was less than 2 feet in May 1977.

Thousand Island Park, N.Y., is a summer resort at the upper end of Wellesley Island, about 6 miles above Alexandria Bay and 4 miles below Clayton. The approach from the river channel is narrow and bristling with rocks. A depth of 10 feet was reported alongside the landing in May 1977. There is a light on the front of the wharf house.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of the Rules and Regulations, preceding. A potable water intake crib of the Thousand Island State Park is located 2,450 feet 207° from the standpipe north of the resort of Wellesley Island, N.Y. The crib is in about 8 feet of water and is not marked.

Outfall Pipeline.—An outfall pipeline for the town of Orleans is located 1,700 feet 255° from standpipe and extends 1,500 feet 195° in about 7 feet of water. It is unmarked.

The course above Wellesley Island is through a wide natural channel of generally deep water with some minimum project depths of 27 feet on the channel line and lesser depth shoals off the channel.

An 18-foot shoal to the south is marked with a buoy (217), and a 22-foot shoal to the north of the channel is marked with a buoy (218) to the north of **Round Island** and **Little Round Island.**

Charts 14766, 14774.—Just below **North Colborne Island**, marked by a light (219) on its westerly end, the course swings for 1⅛ miles to 228° and continues between a buoy (221) marking the northerly edge of a shoal extending about 400 feet off the west end of North Colborne Island, and **Chapman Shoal** light (222).

This course changes about northwest of **Washington Island**, on the south, and continues for 8 miles 246° passing to the southerly edge of a shoal area which extends about 4,000 feet downstream from Calumet Island, marked with a buoy (224), and to the north of the Village of Clayton, N.Y. **Grindstone Island, N.Y.**, lies generally to the north of Clayton.

Washington Island Causeway, N.Y.—The Washington Island Causeway extends 1,300 feet between the foot of Garden Street in the village of Clayton, N.Y., and the southerly tip of Washington Island. The main navigational opening is about 250 feet from the island terminus and has been bridged with a pile cluster at the center of the opening forming a draw on either side. Each draw has a horizontal clearance of 33 feet and a vertical clearance of 6 feet.

Clayton, N.Y., is a village situated on the St. Lawrence River about 17½ miles below its head. The deep water of the river extends to within a short distance of the wharves, at which the depths vary from 8 to 24 feet. A lighted buoy about 700 feet west-southwest of Washington Island marks a shoal along the main river channel approaching Clayton. A buoy marks the west end of submerged cribs located 150 feet north of Rice's Marina.

Marine fuel, at dockside pumps, and service are available.

Charts 14766, 14774, 14767.—A short distance above Clayton, the course goes between a buoy (225) marking the north side of an 18 foot shoal on the south side of the channel, and **Calumet Shoal** light (226) to the southwest of **Calumet Island** on the north side of the channel.

Bartlett Point light (227) is located in shallow water just off the north end of the point on the south shore; about 0.9 mile upstream from Clayton, N.Y.

A 16-foot shoal to the northwest is marked by a buoy (228).

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R § 1250.93 of Rules and Regulations, preceding. A potable water intake of the village of Clayton, N.Y., extends about 400 feet 000° from a point just west of Bartlett Point Light to an intake crib in deep water. There is a depth of 50 feet of water over the crib and it is not marked.

Charts 14767, 14774, 14802.—About 3 miles upstream from Bartlett Point, the International Boundary passes between the westerly end of Grindstone Island and the easterly end of Wolfe Island, Ont., and follows along the south side of Wolfe Island.

Between Grindstone Island and Hickory Island there is a naturally deep unmarked passage leading to the Canadian Middle Channel. Numerous islands, rocks, and shoals line both sides of the cross-over channel.

Wolfe Island Cut, between Hickory (Francis) and Wolfe Islands, and near **Quebec Head** at the extreme easterly end of Wolfe Island was dredged to 23 feet in 1966 with a

width of 450 feet, enabling boats to pass into the Canadian Middle Channel on the north side of Wolfe Island and on to Kingston, Ontario further west, or to Gananoque, Ont., to the northeast. This passage is marked by six buoys and a light exhibited from a white square tower-like building on Quebec Head. Several buoys west of the buoyed cut mark some of the many cribs in this area.

Charts 14767, 14774, 14802.—Wolfe Island, Ont., is a large island of irregular outline, situated directly in the broad entrance to the St. Lawrence River; it is about 6 miles wide at its head or Lake Ontario end, from which it extends, with diminishing width, into the river a distance of about 18 miles. Its shores are much indented and generally characterized by off-lying shoals.

Charts 14767, 14802.—The upper part of the 246° course beyond Bartlett Point passes to the north and west of **Linda Island** light (231) and continues to the next turn just north of a shoal area marked with a buoy (233) located about one mile westerly of Linda Island. The new course upstream passing buoy (234) on the south side and **Carleton Island, N.Y.,** on the north side, continues for 4¼ miles 263° with Linda Island light directly astern and a directional light on **Bayfield Island** straight ahead. The directional light shows equal interval flashes with a white light visible through 003° on the vessel course, a red light to the north visible through a 007° sector, and a green light on the south visible through a 007° sector. **Irvine Point** Range Lights, on Wolfe Island mark the sailing course between Hinckley Flats Shoal on the west and Carleton Island on the east. The range bears 013°20′; the front range light, 35 feet above the river, and the rear range light, 70 feet above the river, are mounted on skeleton towers 2,560 feet apart.

Charts 14767, 14768, 14802.—The southerly course is now 193½° for 3¼ miles passing east of a buoy (236) on the west side of the course, located on a shoal off the east side of Bayfield Island, and buoy (237), marking the northwesterly edge of the shoal off Carleton Island. The easterly side of the channel on the westerly side of Carleton Island is marked with a buoy (239) at the edge of the dredged shoal. The west side of the channel further upstream is marked at the northwest dredged edge of **Hinckley Flats Shoal** with a buoy (238) and at the midpoint of the Hinckley Flats Shoal with a buoy (240). Here the course changes to 213°, marked by a steering light on the southwest tip of Carleton Island, and passes through deep water to the next turn at a buoy (242). A buoy (241) marks the west end of **Feather Bed Shoal** on the east side of the channel.

Cape Vincent Harbor, N.Y.—This harbor is situated on the St. Lawrence River about 2½ miles below Lake Ontario, and has a wharf frontage of about 1½ miles.

Channels.—A dredged channel leads along the city-front on the St. Lawrence River. The channel is protected by a 1,380-foot-long breakwater which parallels the shore. The Federal project depth is 16 feet in the western part of the channel and 20 feet in the eastern part.

Deteriorated Breakwater.—In May 1977, it was reported that the downstream 600 feet of the breakwater at Cape Vincent, N.Y. had deteriorated and was submerged.

The mooring posts on each side of the breakwater, used for layover from weather, may only be used with adequate ships fenders because of metal bars exposed by the deterioration.

Aids to Navigation.—Lights marks each end of the breakwater.

Harbor Facilities.—There is deep water to within a short distance of the wharves which can accommodate vessels drawing up to 10 feet of water. Fuel and dockage for small craft are available in the harbor.

Ferry service is available from a point on shore opposite the westerly end of the breakwater, extending to Alexandria Point on Wolfe Island.

U.S. Coast Guard.—A submarine cable extends from the Coast Guard light attendant station northeasterly to to westerly end of the breakwater.

Submarine Crossings.—Two submarine cables extend from the mainland, one from Cape Vincent and another from a point about 3,900 feet west of the West Breakwater Light to Alexandria Point on Wolfe Island.

Potable Water Intake.—See **42 U.S.C. 264**, published in Certain Laws, preceding, and **21 C.F.R. § 1250.93** of Rules and Regulations, preceding. A potable water intake pipeline of the village of Cape Vincent, N.Y., starts from a point on the shoreline 1,840 feet 226° from the West Breakwater Light and extends 450 feet 305° to about 12 feet of water. The intake end of the pipeline is not marked.

Navigation Regulations.—See **33 C.F.R. § 162.190**, and **33 C.F.R. § 207.610** of Rules and Regulations, preceding.

Charts 14768, 14802.—Point Alexandria is at the eastern end of **Hornes Point,** to the south of **Hinckley Point** at the southeast end of Wolfe Island. A light, 30 feet above the water, on a white circular tower with a red top, is on the east end of the ferry pier for the ferry from Cape Vincent, N.Y. South Side light is exhibited at a height of 47 feet 1¾ miles southwestward of the point. A shoal area above Alexandria Point, on the southeast side of Wolfe Island, is marked at the outermost edge by a buoy (244), 7,300 feet 345° from Tibbetts Point. The head of Lake Ontario shore of the island is marked by **Bear Point,** the most southerly projection, with a spit extending out about ⅝ mile, marked by a buoy; **Big Sandy Bay,** with deep water to within less than a half mile of the shore, is inclosed between Bear and Long Points; by **Long Point,** (St. Lawrence) with shoals continuing 1¼ miles from its extremity and marked by a buoy at the outer end; **Reeds Bay,** with shoals about ¾ mile in offshore extent and a very shallow head, is between Long and Bells Points; by Bells Point, with a bank ½ mile in extent; and by Horseshoe Island, small and just off the northwesterly point.

Charts 14768, 14802.—Above Cape Vincent, the main vessel course through the river continues for 3¾ miles 234°, between the New York shore to the south, and the Wolfe Island, Ont., shore to the north until the Tibbetts Point, N.Y., light is east 1¾ miles 090°. Tibbetts Point Traffic Lighted Buoy, showing a white light with a characteristic of Morse Code Letter "A", is located 9,240 feet 270° from Tibbetts Point Light. At this point, the descriptions are pertinent to Lake Ontario and are noted under that heading.

5. LAKE ONTARIO

Depths and vertical clearances under aerial crossings and bridges herein given are referred to Low Water Datum, which for Lake Ontario is an elevation 242.8 feet above mean water level at Pointe-au-Pere (Father Point), Quebec, on International Great Lakes Datum (1955).

DIMENSIONS, ETC.

Length, steamer track, Burlington Bay Light to head of St. Lawrence River (Tibbetts Point) miles	180
Length, steamer track, Port Dalhousie to head of St. Lawrence River (Tibbetts Point) miles	160
Length (right line), west end of Burlington Bay to Sackets Harbor miles	193
Breadth (right line), about longitude 77°35′ miles	53
Depth, maximum recorded by NOS feet	802

Areas in square miles:	*United States*	*Canada*	*Total*
Water surface of lake*	3,560	3,990	7,550
Entire drainage basin*	18,700	16,100	34,800

*Including Niagara River and St. Lawrence River above Iroquois Dam.

GENERAL DESCRIPTION

Physical Description.—Lake Ontario is the smallest of the Great Lakes. It is comparatively deep, its maximum depth being 802 feet, and its average depth 283 feet, much in excess of the maximum of Lake Erie. The great depth materially limits the fluctuations of level due to wind, rendering them comparatively small. It is little obstructed by ice, seldom freezing except near land. As a general rule, Lake Ontario is free from outlying shoals or dangers. The only shoals dangerous to navigation are those found in the northeastern section of the lake and those off the mouth of the Niagara River, known as the Niagara Bar. The last-named shoals are in the course of vessels entering and leaving the lower section of the Niagara River, and near the path of vessels plying between the Welland Canal and the lake ports to the east, including the St. Lawrence River.

The interlake commerce of Lake Ontario was formerly limited in comparison with the other Great Lakes by reason of the limited size of vessels that could pass through the old Welland Canal. Navigation from Lake Ontario to Lake Erie and thence to the upper lakes is via the Welland Canal, which has a dredged limiting depth of 27 feet and locks of usable dimensions of 730 feet length and 76 feet width. The traffic from Montreal and the lower St. Lawrence River is limited to vessels of a size that can pass through the locks on the St. Lawrence River, which have governing dimensions of 730 feet length, 76 feet width, and 26 feet depth. See also St. Lawrence River-Permissible Draft, chapter 4, preceding.

The actual usable dimensions in the Welland Canal and the Montreal/Lake Ontario section of the St. Lawrence Seaway controlled areas, are determined by the St. Lawrence Seaway Authority of Canada and the Saint Lawrence Seaway Development Corporation of the U.S. Announcements are made through their publication "The Seaway Handbook" (replaced the "St. Lawrence Seaway Masters' Handbook" in 1964) and supplemental Seaway agency announcements, with regard to authorized clearances at that time.

Movement Control of Vessels.—In 1969 the St. Lawrence Seaway Authority and the Saint Lawrence Seaway Development Corporation jointly expanded their vessel traffic control into Lake Ontario. This traffic control was initiated to provide the following: A more efficient scheduling of vessel traffic transiting the Seaway system, an efficient search and rescue coverage, general marine weather broadcasts, and vessel location information to the Trade and the Public.

All vessels in transit between Tibbetts Point and Port Weller, in the Welland Canal, and other ports in Lake Ontario are required to participate in the Lake Traffic Control.

For vessels in the eastern half of Lake Ontario, the Seaway radio station's voice call is "Seaway Sodus;" for vessels in the western half of Lake Ontario the voice call is "Seaway Newcastle;" for vessels whose destination is the Welland Canal the voice call is "Seaway Welland." Consult the Seaway Handbook for details such as the

assigned frequency to maintain, call-in points and the required message content and times of weather broadcasts.

Anchoring of Vessels.—Cautionary Notice.—When coming to anchor vessels masters are cautioned not to foul submarine cables. Fouling cables may not only result in disrupting utility services to adjacent communities but also expose the mariner to the danger of high voltages carried by certain cables. Mariners are advised to slip the anchor rather than cut the cable if the normal practice of good seamanship fails to clear the fouled anchor. Lost gear or damaged cables should be reported to the authority having jurisdiction over the waterway.

Improvements.—Most of the commercial harbors on the lake have been improved by work at their entrances, including the building of jetties and dredging; in addition, at Oswego a large outer harbor has been formed by the construction of breakwaters.

Vessels and tows coming up the St. Lawrence River, on approaching Lake Ontario, often find that storm conditions render it unsafe for them to venture into the open lake. To provide a place to lay up under such conditions, the United States has constructed a breakwater at Cape Vincent, near the head of the St. Lawrence.

The general result of the improvements provided by the United States Government is to give harbor facilities for vessels drawing up to 26 feet of water. At many of the harbors periodical shoaling takes place, and frequent dredging is required to maintain the channels.

Fluctuations of Water Level.—The average or normal elevation of the lake surface varies irregularly from year to year. During the course of each year, the surface is subject to a consistent seasonal rise and fall, the lowest stages prevailing during the winter months and the highest during the summer months.

In addition to the annual fluctuation, there are also oscillations of irregular amount and duration produced by storms. Some, with periods of a few minutes to a few hours, are the result of squall conditions, the fluctuations being produced by a combination of wind and barometric pressure changes that accompany the squalls. At other times the lake level is affected for somewhat longer periods, such as many hours or a day, by strong winds of sustained speed and direction which drive the surface water forward in greater volume than that carried by the lower return currents, thus raising the elevation on the lee shore and lowering it on the weather shore. Such effects are more pronounced in bays and at extremities of the lake, where the impelled water is concentrated in a restricted space by the converging shores, especially if coupled with a gradually sloping inshore bottom which reduces the depth and checks the reverse flow via lower currents.

Weather Conditions.—The highest wind velocity, as derived from records of the National Weather Service at certain shore stations, is 63 knots (73 miles per hour) from the west at Rochester, N.Y., in January 1950; the shore station values are subject to the condition, that the freeflow of the wind is diminished by land friction. Although there are a limited number of observations on anomometer-equipped vessels while offshore, since 1963 a maximum wind of 50 knots (58 m.p.h.) has been recorded. From the records of the Atmospheric Environment Service of the Canada Department of Environment (formerly Meteorological Branch of the Canadian Ministry of Transport), maximum winds observed at various stations along and near the shoreline are noted below in sequence of station, speed, direction, date. These are sustained speeds over a one-hour period at airport locations (A) but one-minute averages at all other stations, and do not show maximum gusts which may be much higher. The speeds are in knots, with the value in miles-per-hour in brackets: Toronto Int. A 48 (55) SW, Mar. 1959; Toronto Island A. 49 (56) SW, Mar. 1942; Trenton A 56 (65) WSW, Mar. 1964; Main Duck Island 56 (64) W, Oct. 1965; Hamilton Marine Police 41 (47) NE, Dec. 1971; Cobourg 54 (62) W, Dec. 1938.

Magnetic Observations.—With a view to the determination of compass declination (or variation) on Lake Ontario, magnetic observations were made by the Lake Survey in the years of 1913 and 1931, during which observations were made at short distances apart over the entire lake.

Over Lake Ontario, the compass variation does not change uniformly in going east or west, and there are many spots of wide departure from the normal variation—that is, the value predominating in the surrounding region. These irregularities are shown on the National Ocean Survey's general chart No. 14500 and some of them are of particular interest and concern to navigation because of their outlying positions over deep water, on or near the path of vessels proceeding to and from the Welland Canal and Niagara River entrances.

At the northerly entrance to the St. Lawrence River, approaching Kingston, there is a great change in variation along the sailing line from south of Kingston Penitentiary to the Kingston waterfront, the values ranging from 18° E. to 30° W. in a distance of 1¾ miles. In this connection, attention is directed to the account of special observations made by Canadian officials in the neighborhood of Kingston, published in the description of that harbor in this Pilot.

At the southerly entrance to St. Lawrence River, at a point 1½ miles west of Tibbetts Point Light, the variation is 019° west, while at a point on the vessel course 6 miles southwesterly, it is only 007° west, and at a point 6 miles down the St. Lawrence River, it is 011° west. About 2 miles to the northward of East Charity Shoal Light, at a point 3 miles from Pigeon Island Light on a line thence to Tibbetts Point Light, a variation of but 001° west occurs.

Separate Steamer Lanes for Vessels.—The Lake Carriers' Association and the Dominion Marine Association have prescribed, for vessels enrolled in the associations, the following separation of routes for up-bound and down-bound traffic in Lake Ontario:

Downbound vessels from Port Weller to Cape Vincent, from a position one-half mile off Port Weller piers, shall lay a course 048½° for 8.5 miles to pass not more than 1.5 miles off Niagara Bar Buoy; thence 074° for 103 miles to a position not less than 7 miles off Point Petre; thence

069° for 27 miles to a position 3.5 miles off Main Duck Island Light; thence 039° for 12.2 miles to East Charity Shoal Traffic Buoy.

Downbound vessels from Toronto, Port Credit, Clarkson to Cape Vincent, from a position not less than 2.5 miles off Gibraltar Point, shall lay a course 085° for 113.7 miles to a position not less than 7 miles off Point Petre; thence recommended downbound courses to East Charity Shoal Traffic Buoy.

Downbound vessels from Port Weller to Toronto, Western entrance, from a position one-half mile off Port Weller piers, shall lay a course 314° for 4 miles; thence 342° for 23.7 miles to Toronto Approach Buoy.

Downbound vessels from Port Weller to Hamilton, from a position one-half mile off Port Weller piers, shall lay a course 314° for 4 miles; thence 273° for 25 miles to Burlington Approach Buoy.

Upbound vessels from Cape Vincent to Port Weller, from East Charity Shoal Traffic Buoy, shall lay a course 240° for 14.5 miles to a position one-half mile off Psyche Shoal Buoy; thence 249° for 22.5 miles to a position not more than 3 miles off Point Petre; thence 254° for 102 miles to a position not less than 5.5 miles off Niagara Bar Buoy; thence 211½° for 11.25 miles to a position one-half mile off Port Weller piers.

Upbound vessels from Cape Vincent to Toronto, Port Credit, and Carkson, from a position not more than 3 miles off Point Petre, shall lay a course 263° for 113.25 miles to a position not more than 1.5 miles off Gibraltar Point; thence to destination.

Upbound vessels from Toronto Western entrance, to Port Weller, from the Toronto Approach Buoy, shall lay a course 158° for 27.25 miles to a position one-half mile off Port Weller piers.

Upbound vessels from Hamilton to Port Weller, from a position one-half mile off Burlington piers, shall lay a course 098° for 28.7 miles to a position one-half mile off Port Weller piers.

It is understood that masters may exercise discretion in departing from these courses when ice and weather conditions are such as to warrant it.

The recommended courses are designated on the general chart No. 14800, Lake Ontario.

DETAILED DESCRIPTIONS OF COAST LINE, HARBORS, ISLANDS, AND REEFS

Section I.—Easterly Shore from Tibbetts Point, Head of St. Lawrence River, to Oswego, N.Y.

Chart 14802.—The coast between Tibbetts Point and Point Peninsula, N.Y., the points being about 11 miles apart on a straight line, is decidedly irregular, being characterized by numerous bays and outlying islands and shoals.

Tibbetts Point is on the southerly side of the main ship channel leading from the St. Lawrence River to Lake Ontario and 3 miles southwesterly from Cape Vincent, N.Y. Tibbetts Point Light, 69 feet above the water, is shown from a 59-foot white conical tower on the point; a radiobeacon is at the light. Reefs extend off about 1,000 feet around the point. A rock shoal about 1,600 feet long north and south, lies with its northerly end about ¾ mile 252° from Tibbetts Point Light. The least depth on the shoal is 18 feet, near its center and a lighted buoy marks the westerly side of the 18-foot shoal.

Wilson Point and Bay.—Wilson Point is about one mile southeasterly from Tibbetts Point, and between the two, Fuller Bay extends inshore about ½ mile. A rocky spit with but 11 feet near its outer end and shoaler water inside extends about 3,500 feet southwesterly from the end of Wilson Point. Wilson Bay is a rectangular-shaped indentation about ⅞ mile long and ½ mile across, with a good depth of water, opening between Wilson Point on the north and a broad peninsula to the south terminating in Dablon Point. The deep water at the entrance to the bay is contracted by the spit extending from Wilson Point and by a shallow bank reaching 5,000 feet westward from Dablon Point, with a depth of 11 feet at the outer end and a 4-foot spot about 3,500 feet out.

Mud Bay is a narrow, shallow inlet about 1⅝ miles long, to eastward of Dablon Point and with Baird Point on its southerly side.

Grenadier and Fox Islands.—**Grenadier Island**, 2¼ miles long northeast and southwest and 1⅜ miles in maximum width, lies ⅞ mile southwest of Baird Point. **Fox Island**, east of Grenadier Island, is of irregular outline, about ¾ mile across at its south end and quite narrow at its north end. Between it's northwesterly face having a length of about 1½ miles, and Grenadier Island, is a shallow passage about ⅝ mile wide, affording about 8 feet draft. Both islands are separated from the shore by an expanse of shallow water, with mud bottom, the northwesterly limit of which is defined by a line from Baird Point passing 80 feet off the northwesterly tangent of Grenadier Island. The outermost or westerly extension of the bank is at a point about ¾ mile southwestward of the westerly point of Grenadier Island, and the southerly limit is indicated by a line thence to the mainland point northwest of Point Peninsula. From that point, shoal water extends southwestward about ¾ mile, with the 12-foot contour about ⅜ mile out.

Allan Otty Shoal is a narrow ridge running about ½ mile east and west, with 13 feet depth near its east end and a least depth of 11 feet at its center, which is 2½ miles northeasterly from East Charity Shoal Light and 4¾ miles southwesterly from Tibbetts Point Light. A lighted buoy is moored on the southeasterly side of the shoal.

Charity, East Charity, and South Charity Shoals form a group of outlying obstructions in the approach from the south channel of the St. Lawrence River and are situated from 5 to 6 miles westward of Grenadier Island.

Charity Shoal, the most northerly, is a narrow rocky shoal ¾ mile long in an east and west direction and about 1,000 feet in greatest width, with least depth of

about one foot near its west end. A buoy is moored on the westerly side of the shoal, abreast of the shoalest spot and about 5,500 feet 286° from East Charity Shoal Light.

East Charity Shoal is about ⅝ mile to southeastward of Charity Shoal, and is marked by a light. The shoal extends about 700 feet north of the light. The passage between Charity and East Charity Shoals is rendered unsafe by South Charity Shoal, a narrow ridge about ⅝ mile long, having a minimum depth of about 11½ feet at a point about one mile southwest from East Charity Shoal Light. The southwest extremity of South Charity Shoal is marked by a buoy in about 32 feet of water. About midway on a line between South Charity Shoal and Main Duck Island, a detached 28-foot shoal spot is marked with a buoy.

East Charity Shoal Traffic Lighted Buoy lies in about 140 feet of water approximately, 7,600 feet 138° from East Charity Shoal Light. Vessels bound from and to the south channel of the St. Lawrence River should pass close on this buoy and well to the eastward and southward of East Charity Shoal Light.

Charts 14802, 14811.—Point Peninsula is a large and almost detached body of land extending 6 miles in a northeast and southwest direction and about 3 miles in maximum width at about the middle of its length, where its northwesterly projection joins a broad point extending about 3 miles southerly from the mainland. Along its westerly or lake frontage side and around the southerly end, shoals attain an extent of ¾ mile or less. The southeasterly side is generally more than 30 feet deep except for a shoal about 3 miles long and ½ mile wide having depths of 22 to 28 feet. Between its southeasterly face, and the opposite mainland shore to the east terminating in **Pillar Point,** is a deep channel not less than ¾ mile wide, and extending in a general northeast direction, giving access to Guffin and Chaumont Bays. A lighted buoy located about 1 mile off the southerly tip of Point Peninsula, marks the southeasterly side of the shoal off the southwest end of Point Peninsula.

The distance from Point Peninsula southerly to Stony Point is about 8 miles, but irregular recessions of the shore, to northward and eastward within the line between the points, form a group of large and deep bays, including Chaumont and Guffin Bays on the north and Black River Bay and Henderson Bay on the south. To westward outside of the line of the points above mentioned, lie Stony and Galloo Islands, the main vessel courses from the St. Lawrence River to the southward passing westerly of these islands.

Chaumont Bay is separated from Lake Ontario by Point Peninsula and the adjoining mainland point, and is about 20 miles by deep water from Tibbetts Point or about 40 miles northeasterly of Oswego. It is a large and well protected area, with good anchorage in mud and 18 to 30 feet of water to within ⅜ mile of shore, except for shoals in the southwesterly end and also extending 1¼ miles from the north shore between the villages of Three Mile Bay and Chaumont.

Three Mile Bay, N.Y., is a village situated at the north end of a small bay of the same name, the latter being in the north part of Chaumont Bay. In May 1977, the reported controlling depth through the bay to the village was 3 feet.

Chaumont, N.Y.—This village is situated at the upper end of Chaumont Bay. There are two small bays formed by **Independence Point** extending from the mainland between the bays. They are both arms of Chaumont Bay, leading to the village, and there are landings in each which will accommodate boats drawing 4 feet of water.

Aids to Navigation.—Chaumont Harbor Light is located just in from the end of Independence Point which separates the two small bays, and on the porthand side of the channel leading to the docks in the easterly bay. **Johnson Shoal,** with 2 feet of least depth over boulders, is on the northwesterly side of the approach and is marked on its southeasterly side by a buoy located 1⅛ miles 237¾° from the above light. Buoys mark the limits of deep water in the harbor and approaches.

Harbor Facilities.—The **Chaumont River** enters the westerly bay arm at the north end of the village. A highway bridge with 63-foot clear opening and a 20.8 foot vertical clearance, crosses the river about 0.8 mile above the mouth. A limiting clear opening of 50 feet also exists between the piers of a former railroad bridge 0.1 mile farther upstream.

There are several stone quarries at Chaumont.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A water intake pipeline commences on the shore at a point 325 feet 080° from Chaumont Harbor Light, and extends 500 feet 187° to an intake with 7 feet of water over it. The intake is not marked.

Guffin Bay is to the eastward of Chaumont Bay, from which it is separated by **Point Salubrious** and Cherry Island. There is good water within the bay except for about ½ mile at its head, where **Guffin Creek** enters. The deep portion affords good anchorage in 24 to 36 feet with mud bottom.

Cherry Island, lying to the southwestward in the extension of Point Salubrious and separated therefrom by a passage about ½ mile wide and 15 to 19 feet deep, is 1⅛ miles long from northeast to southwest and about ¼ mile in maximum width, with clean shores. A light is located on the southwesterly end of the island.

Black River Bay opens about 3 miles southeasterly from the channel into Chaumont and Guffin Bays, its entrance being marked by **Everleigh Point** on the north side and Sackets Harbor Light (on **Horse Island**) on the south side. The bay averages a little more than a mile in width and is about 5½ miles long, extending northeasterly. The water is deep through the bay and close to the shores except for a very shallow expanse filling the upper 1½ miles. **Black River** enters at the head of the bay, and a draft about 3 feet can be carried over the shallow expanse to between the submerged ruins of breakwaters extending from the shore about ¾ mile into the river and up to the Village of Dexter.

Sackets Harbor, N.Y.—This harbor is located in the southwest section of Black River Bay, about 22 miles from Tibbetts Point by water, or about 41 miles by water

northeasterly from Oswego. The harbor, about 7 acres in extent, is protected on the north side by **Navy Point.** In 1976, the controlling depth in the entrance east of Navy Point was 9 feet. In 1977, the harbor basin had a reported controlling depth of 9 feet except for shoaling to 2 feet in the west end. Good anchorage is available with sand, mud, gravel, and rock bottom.

Aids to Navigation.—Sackets Harbor Light, mounted 57 feet above water on a gray skeleton tower, is on the north side of Horse Island on the south side of the entrance to Black River Bay. Navy Point Light, mounted 25 feet above water on a white column, is located on the northeast end of Navy Point.

A submarine cable extends from the foot of Bayard Street in Sackets Harbor, about 800 feet northeasterly, curving to the southwest around Navy Point and passing north of Stony Island to the northeasterly end of Galloo Island. A mooring crib about midway between Horse Island and Sackets Harbor serves as an oil unloading terminal, with about 22 feet of water reported alongside in May 1977.

Coast Guard Station.—Sackets Harbor Coast Guard Station, seasonally operated, is on the southerly side of the harbor about 800 feet south of Navy Point Light. The station maintains radio guard during daylight hours, but usually on weekends and holidays only.

Harbor Facilities.—Small-craft facilities, including a marine hoist, are available in the harbor.

Henderson Bay, immediately southwestward of Black River Bay and about 35 miles in a northeasterly direction from Oswego, is a broad recession whose lakeward limits are indicated in a southeasterly line by Horse Island, Bass and Gull Islands, and the irregular and partly submerged projection of land nearly 2 miles long, terminating in Six Town Point, at the southwestern entrance to the bay. The extreme extent of the bay from northeast to southwest, parallel with the local trend to the shore, is about 7 miles, and its width at right angles to the shore line averages about 2 miles. Shallow water reaches about ¾ mile to southwestward from Horse Island, and a shoal border from 1 to 1½ wide, continues southward along the easterly bay shore to **Campbell Point,** a distance of about 2½ miles from Horse Island. A shoal with only 2 feet of water over it is found about ⅝ mile west of Campbell Point.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. An intake pipeline extends about 3,300 feet off Boulton's Beach, 4,000 feet southeast of Sackets Harbor Light, into Henderson Bay to an intake crib in 24 feet of water and having 13 feet of water over the crib. The crib and pipeline are not marked.

Bass (or Snake) Island is situated 1½ miles southwest of Horse Island, and **Gull (or Mud Block) Island** is ⅞ mile southwesterly from **Bass Island.** Both islands are small in size and are situated on a very shallow bank about ⅝ mile in maximum width, which extends ¼ mile northeasterly from Bass Island and nearly ½ mile southwesterly from Gull Island. The deep channel between the banks off Horse and Bass Islands is about ⅝ mile wide. A spit extends 1¼ miles northeasterly from **Six Town Point,** with a least depth of one foot located ⅞ mile from the point, there being about ⅜ mile width of deep water between its outer portion and Gull Island on a northeasterly-southwesterly course. **Lime Barrel Shoal** buoy, located 3⅜ mile 230½° from Sackets Harbor Light, marks an entrance for pleasure craft into Henderson Bay between the buoy and Six Town Point. Least depths across the spit are 11–13 feet.

Aside from the shoals above mentioned, the water in Henderson Bay has depths of 20 to 40 feet close in to the shore, bottom mainly mud and sand, and good anchorage may be had. There are several landings in the bay, the principal one being at Henderson Harbor. The others are small summer-resort landings accommodating only light-draft boats.

Henderson Harbor is a small summer resort situated on the northeast side of a small inlet called Henderson Harbor, the latter being at the extreme southerly part of Henderson Bay. The harbor is about ¾ mile long and ½ mile wide, and has deep water as far up as the village wharves, which will accommodate vessels drawing from 5 to 10 feet of water. In May 1977 the reported controlling depth to marinas in the south end of the harbor was 4 feet. Fuel, marine supplies and repair facilities are available in the summer.

Anchorage Regulations.—See 33 CFR § 110.1 and § 110.87 of Rules and Regulations, preceding.

Whites Bay, with good depths, and **Snow Shoe Bay,** small and shallow, are indentations in the westerly shore of Henderson Bay, and are northwest of Henderson Harbor. A channel for small craft is maintained by private interests across the narrow peninsula extending northeasterly of Stony Point and connects Snow Shoe Bay with Lake Ontario. A fixed bridge across the channel offers a boat 30 feet clear width, 12 feet vertical clearance, and depths of about 3 feet are available.

Chart 14802.—Stony Point.—The lake shore of the Stony Point headland extending west of Henderson Bay and trending southwesterly to Stony Point Light, is bold and deep-to. Stony Point Light is on the western extremity of the point and about 28 miles northeasterly of Oswego.

Stony Island, N.Y. lies about 2¼ miles to northwestward off the Stony Point headland above mentioned; it is about 4 miles in extreme length from northeast to southwest and about 1¼ miles in greatest width. The channel between the mainland and the island is broad and deep and is occasionally used by tows going to and from the St. Lawrence River. Extending about 2¼ miles southwesterly from Stony Island is a rocky shoal with prevailing depths of 6 and 7 feet, on the northwesterly side of which, detached about ⅜ mile from the nearest point of Stony Island, is situated **Calf Island.** Near the extremity of the shoal, on the 18-foot contour and 1½ miles southwest from the southwest end of Calf Island, is Calf Island Spit buoy. A small rock shoal having a least depth of about 13 feet is located about one mile south of Calf Island Spit buoy. It is nearly on the sailing course between Rochester and Sackets Harbor. The other shores

of Stony Island are clean, the greatest extent of shallow water being about 2,500 feet at the northeasterly end. Off this point, a lighted buoy is moored in 33 feet of water, as an aid for the passage between it and Point Penninsula. On the westerly side and one mile from the northeasterly end is **Dutch John Bay**, a small bight of deep water, from the head of which a narrow strip of water extends southwesterly almost through the length of the island.

West of Stony and Calf Islands, **Little Galloo Island** is situated about halfway between the southwesterly ends of Stony and Galloo Islands on a bank one mile long and ½ mile wide, with broad and deep channels to either side.

Galloo Island, N.Y., about 2⅜ miles westerly of Stony Island is 4¼ miles long northeast and southwest with a maximum width of 1¼ miles. On the southeasterly side of the northeasterly end of Galloo Island there is a shelter here for small craft in **Gill Harbor**, a small bay inclosed by a gravel spit across which a channel has been dredged. Soundings taken in 1961 indicated a controlling depth of 7 feet in the entrance channel and a bottom width of about 50 feet abreast of the spit.

On the southwesterly point of Galloo Island is a light with a diaphragm fog horn sounding continuously. Reefs extend ⅜ to ½ mile off around the northeasterly and southwesterly ends of the island, the two sides being bold.

Near the northeasterly end of the island, an area known locally as North Pond, has a depth of 3 feet. The entrance is through a narrow channel along a crib pier at the easterly end of the pond. Soundings taken in 1976 indicated a controlling channel depth of 2 feet in the entrance.

Galloo Shoal, a rocky patch about ½ mile long and half as wide, with 3 feet least water on it, lies 1⅛ miles westerly from Galloo Island Light; it is marked off its southwest end by a buoy moored in 30 feet of water about 7,600 feet 285½° from Galloo Island Light. Vessels bound to and from the St. Lawrence River should pass to westward of the buoy, although there is a deep passage about ⅞ mile wide between the shoal and Galloo Island.

Obstruction.—A snag is located 5,000 feet 326° from Galloo Island Light. There is a depth of 16 feet over the snag and it is not marked.

Wreck.—The submerged wreck of a barge is located about 7,500 feet 354° from Galloo Island Light. The wreck is not marked.

From Stony Point the coast has a trend generally southerly for about 22 miles, and thence westerly for about 7 miles to Nine Mile Point (about 9 miles northeast of Oswego), the broad and open formation in the bend east of Nine Mile Point being called Mexico Bay.

About 4½ miles southeasterly of Stony Point a bank extends ⅞ mile from the shore, on which, about ⅝ mile out, there is a shoal with only one foot of water, called **Drowned Island**; the intervening shore from Stony Point consists of a series of irregular indentations, with a rocky bank extending off an average distance of ½ mile.

Chart 14803.—Below Drowned Island, the lake shore proper presents a regular front with deep water from ⅞ to one mile out, southerly to **Selkirk** at the mouth of the **Salmon River** and about 20 miles from Stony Point. The Salmon River has depths of 3 to 6 feet, however a reappearing sand bar at the entrance limits draft to about 2 feet. In the preceding stretch, several shallow ponds, into which empty numerous creeks, are practically cut off from the lake by narrow ridges of shore. One of these, North Pond, is situated about 13 miles south of Stony Point.

North Pond, N.Y.—This pond is one of the largest bodies of water in the reach of the eastern end of Lake Ontario and is separated from the lake by a long, narrow neck of land. The narrow, continually shifting entrance channel, privately marked, with a depth of 2 feet in 1976, had in May 1977 a reported controlling depth of 3 feet. Local knowledge is advised.

The pond is about 3½ miles long and about 2 miles wide, being generally from 6 to 13 feet deep in the central area and less than 6 feet within 1,000 feet of the shore and over several small shoals on the north, east and south sides.

Sandy Pond Village is located at the southerly end of the pond where some marine facilities are available.

In **Mexico Bay**, from Selkirk to **Nine Mile Point**, there is rock bottom and deep water to within one mile of the shore, becoming deep-to within ¼ mile of Nine Mile Point. The headland west of Nine Mile Point is deep-to, and thence southwesterly to Oswego the shallow water no where exceeds ¾ mile in offshore extent. The **Little Salmon River**, on which about one mile inland is the town of Texas, enters the southeastern part of the bay.

Water Intake and Outfall.—A water intake tunnel and a water discharge tunnel were completed in 1973 at the site of the New York State Power Authority's new James A. FitzPatrick Nuclear Power Plant at Nine Mile Point, town of Scriba about 7½ miles northeasterly of Oswego Harbor, N.Y. The site is adjacent to and east of the Niagara Mohawk Corp. Nine Mile Point Nuclear Station. The intake tunnel commences at the north wall of the station and extends 250 feet 000° where it then turns and extends 910 feet 018°30′ to an intake structure in 20 feet of water. The least depth over the intake is 10 feet. The discharge tunnel begins at the north wall of the station and extends 1,107 feet 018°30′ to a point from where it extends 310 feet 009° to a point where two diffuser lines begin. The diffuser lines extend 387 feet 099° and 387 feet 279° respectively. There is a least depth over the diffusers of 18 feet.

Water Intake.—A water intake is located at the Niagara Mohawk Power Corp., Nine Mile Point Nuclear Station, in the town of Scriba, N.Y., about 6½ miles northeast of Oswego. The pipeline commences at a point on the shoreline 410 feet 339° from the stack at the nuclear station and extends to a point 1,350 feet 343° from the stack to a crib in 23 feet of water. The least depth over the intake crib is 15 feet and it is not marked.

Outfall Pipeline.—The outfall pipeline of the Niagara Mohawk Power Corp., Nine Mile Point Nuclear Station commences at the shoreline 420 feet 326° from the stack at the nuclear station and extends to a point 770 feet 329° from the stack to a crib. There is a least depth of 10 feet over the crib and it is not marked.

Sewer Outfall.—A 24-inch sewer outfall pipeline of the city of Oswego commences in the vicinity of East Eleventh

Street and extends 1,020 feet lakeward of the shoreline. There is a swept depth of 12 feet over the outfall diffuser. The outlet is not marked.

Charts 14803, 14813, 14786.—Oswego Harbor, N.Y.—This harbor is located on the south shore of the lake about 15 miles from its east end and about 45 miles southerly from Tibbetts Point at the head of the St. Lawrence River. The harbor is the terminus of the Oswego Canal of the New York State Barge Canal System. The harbor comprises an outer breakwater harbor of refuge, and an inner terminal harbor in the Oswego River. Having regard to its location and to the fact that most of the very severe storms are from the west and northwest, with a fetch the entire length of the lake, the outer harbor is of value as a refuge to vessels passing this locality.

Channels.—A dredged approach channel leads eastward from Lake Ontario southward of a detached breakwater and between converging breakwaters into the outer harbor of refuge. From the outer harbor, the inner harbor extends up the Oswego River for 0.5 mile along the Oswego piers. Another channel, protected by an extension of the west breakwater, extends southwestward from the outer harbor along the shore to a turning basin.

In May 1978, the controlling depths were 27 feet at midchannel in the approach channel, thence 24 feet in the channel through the outer harbor, thence 24 feet for 0.3 mile in the river channel, thence 22 feet to the head of the project at Seneca Street. The outer harbor west of the entrance channel had depths of 20 feet except for shoaling along the west edge. The outer harbor east of the entrance channel was not being maintained. The channel to the turning basin had a controlling depth of 21 feet at midchannel with 20 feet in the turning basin.

Mooring vessels to the breakwaters, and anchoring in the outer harbor where it will interfere with navigation, are prohibited.

Aids to Navigation.—Outer lighted buoy is located 2,230 feet 321° from West Pierhead Light, and marks the north side of the lake approach to the harbor entrance.

Oswego Harbor Detached Breakwater West End Light, 30 feet above the water, is located 1,150 feet 013° from Oswego Harbor West Pierhead Light. Oswego Harbor Detached Breakwater East End Light, 30 feet above the water, is located 750 feet 024° from Oswego Harbor East Breakwater Light.

Oswego East Breakwater Light is located on the pierhead at the outer end of the east breakwater. Oswego West Pierhead Light is located on the pierhead at the outer end of the west breakwater; an air diaphragm foghorn and a radio-beacon are operated at this station.

The junction of the outer harbor and the inner harbor is marked by a lighted buoy on the west side and an unlighted buoy on the east side.

The outer harbor west channel is marked on the northerly edge at the entrance by a light; the southerly edge is marked near the entrance, and at about the midpoint along the channel line.

Harbor Facilities.—The Port of Oswego Authority operates a modern well equipped terminal with adequate storage and handling facilities on the east side of the Oswego River at its lower end. Dockside depths are generally comparable to the Federal project depths.

The Port of Oswego Authority terminal wharf on the west side of the Oswego River is 1,000 feet long and 150 feet wide and extends from the northerly end of West First Street out to the harbor line in the outer harbor. In 1976, there was available a channel 21 feet deep and 70 feet wide on the east side and a channel 19 feet deep and 80 feet wide on the west side of the wharf, which is equipped with a large freight house and a grain elevator with capacity of 1 million bushels. For vessels docking at the elevator, the channel edge on the east side is marked by two buoys, and the channel edge west of the face is marked by a buoy.

The Port of Oswego Authority coal dock is about 800 feet west of the Port of Oswego Authority terminal wharf. On the west side of the coal dock, is an available depth of 17 feet for a length of about 700 feet.

Barge-Canal and Terminals.—The State of New York has dredged a channel in the easterly side of the river, 14 feet deep and 190 feet wide, at the upper end of the Government improvement at Seneca Street to 150 feet wide at West Bridge Street which is also the lake end entrance to the 45-foot wide Barge Canal Lock No. 8 of the Oswego Canal described in connection with the New York State Barge Canal System. The State has also constructed a terminal along this channel from the north line of Seneca Street to the north line of Bridge Street. A lighted buoy marks the west edge of the State dredged channel at a point about 1,000 feet north of Bridge Street Bridge which is the upstream end of the U.S. project area in the river.

Lake to Barge Canal Clearances.—The vertical clearance of the Bridge Street Bridge is 26 feet; this is at normal pool level, New York State Barge Canal System datum. The staff gauge on the lower bullnose at Lock 0–8 that is visible to boaters coming in from the lake is set on Barge Canal datum.

Coast Guard Station.—Oswego Coast Guard Station is on the south side of a basin about 0.7 mile southward of West Pierhead Light.

National Weather Service Warning Display Station.—Signals are displayed from a steel tower on the bank 60 feet above the lake on the east side of the mouth of the Oswego River at old Fort Ontario.

Submerged Pipeline.—A reactivated (1973) submerged pipeline is located opposite the Hammermill Paper Co., about one mile east of the entrance to the Oswego River. The pipeline commences at a point on the shoreline 5,650 feet 094° from West Pierhead Light, and extends 350 feet 337° into Lake Ontario. The pipeline is not marked.

Water Intakes.—A water intake is located at the west end of the west breakwater. The pipeline commences at a point on the shoreline 6,130 feet 219° from West Pierhead Light, and extends 540 feet 326°, passing under the shore arm of the west breakwater to an intake crib in about 18 feet of water. There is a depth of 13 feet of water over the crib and it is marked with a buoy.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules

and Regulations, preceding. A potable water intake tunnel of the city of Oswego commences at the shoreline 7,200 feet 222° from West Pierhead Light, and extends 5,850 feet 321° into the lake to a crib in about 54 feet of water. There is a depth of 40 feet of water over the crib and it is not marked.

Outfall Pipeline.—The Oswego outfall pipeline of Onondaga County commences at the shoreline 10,200 feet 230° from West Pierhead Light, and extends 1,150 feet 348° into the lake to an outfall structure in about 24 feet of water. There is a depth of 24 feet over the outfall structure.

Water Intake.—A water intake tunnel commences from a point on shore 6,500 feet 221° from the west pierhead light and extends 760 feet 328° to a crib in 21 feet of water. The crib is marked with a buoy and has 12 feet over.

Outfall Tunnel.—A water outfall tunnel commences from a point on shore 6,340 feet 220° from the west pierhead light and extends 225 feet 000° thence 1,020 feet 338° to a crib in 25 feet of water. The crib is not marked and has 14 feet of water over.

Submerged Cable.—A submerged cable commences at a point on the shoreline at the east side of the west breakwater shore arm, and extends along the inside of the west breakwater to the West Pierhead Light.

Dumping Ground.—A dumping ground is located in more than 60 feet of water about 1½ miles northwest of the West Pierhead Light. It is about ½ mile square in an area between the recommended vessel courses. There is a least depth of 35 feet over the dumping ground which is not marked.

Section II.—Southerly Shore from Oswego to Rochester, N.Y.

Regional charts: Chart 14800, Coast Chart 14803; Coast Chart 14804

Chart 14803.—From Oswego, the coast runs southwesterly for about 7 miles to **West Ninemile Point.** About 3 miles northeasterly of this point are the **Ford Shoals,** consisting of boulders and stony mounds with scant depths, reaching ⅝ mile from shore and marked off the northwesterly edge by a lighted buoy.

Wreckage.—A sunken boiler, 5 by 9 feet, with its northwest corner awash at Low Water Datum, lies in 9 feet of water about 1,800 feet offshore and 2,400 feet southeast of the Ford Shoal buoy.

Except for the sunken boiler, this section of shore is generally bold, with no outlying obstructions. From West Ninemile Point to Little Sodus Bay, a distance of about 6 miles, the coast is hilly and trends about southwesterly; the offshore bank does not exceed ½ miles in width, except abreast of Sabin Point, just easterly of the Little Sodus piers, where the deep water lies about ¾ mile out. Little Sodus Bay lies west of Sabin Point and a small body of water called "The Pond" lies to the east of Sabin Point. There is a channel from Lake Ontario into the Pond running under a fixed bridge, however the Pond is virtually closed to navigation due to its proximity to a bathing beach and the bridge.

Dumping Ground.—About 2½ miles northeasterly of Little Sodus Bay is a dumping ground in more than 50 feet of water. It is about ½ mile square with a least depth of 35 feet. The ground is not marked.

Little Sodus Bay, N.Y.—This bay, 13 miles west of Oswego, extends 2 miles due south from the shore of the lake; its greatest width is ⅝ mile and its least width ¼ mile. Its shores are bold, except in the bights. There is good anchorage in the bay, with clay bottom and depths of 24 to 36 feet.

Channels.—The bay is entered from Lake Ontario through a dredged channel between parallel piers. The inner end of the east pier extends laterally eastward to enclose the bay. In May 1978, the controlling depth was 7½ feet in the eastern half of the entrance channel with the western half shoaled to 4 feet.

Aids to Navigation.—Fair Haven Outer Light is near the outer end of the west pier.

Harbor Facilities.—There is a State Park dock in the northeast corner of the bay, wharves and landings at **Fair Haven** in the southeast corner, and facilities for marine service and gasoline in the southwest corner. During west winds the current across the lake ends of the piers is very strong, and a vessel under insufficient headway is liable to be carried to eastward past the entrance, where the bottom is hardpan, with no holding ground for an anchor.

The coast from Little Sodus Bay to Sodus Bay, N.Y., is of irregular trend, the general direction being southwesterly and the distance about 14 miles; it is characterized by hilly shores and a rock bank extending out a maximum distance of ⅞ mile within the 18-foot contour.

Blind Sodus Bay, cut off from the lake by a narrow strip of land and having a maximum depth of about 21 feet, lies within the point just westerly of Little Sodus Bay.

Charts 14804, 14803.—Port Bay, N.Y.—This body of water is about halfway between Little Sodus and Sodus Bays. An entrance, built by local interests, is located about 1,400 feet west of the northeast corner of the bay and is protected on the west by a short pier and fill. In August 1976, the controlling depth in the channel was 2 feet. Privately maintained lights and buoys mark the entrance to the bay. The entrance is extremely difficult to make in rough weather. Good water is available inside the bay and gasoline is available at dockside.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A water intake pipeline of the village of Wolcott, N.Y., is located about 2,000 feet east of the entrance to Port Bay. The pipeline extends northeasterly about 2,000 feet and terminates in about 12 feet of water. It is not marked.

Caution Area.—Special Use Airspace, as noted in Federal Regulations 14 C.F.R. Part 73 (Federal Aviation Adm., Dept. of Transp.), Special Use Airspace, consists of the area above the surface of the earth as outlined by geographic coordinates and is to be used and controlled for specific purposes in the operation of aircraft. Area R-5203, Oswego, N.Y., beginning at 43°37'00" N., 76°45'00" W.; to 43°24'00" N., 76°45'00" W.; to 43°24'00" N., 78°00'00"

W.; to 43°37′00″ N., 78°00′00″ W.; to the point of beginning may be used for military purposes from the surface to a flight level of 50,000 feet. The using agency is the Commander, 21st Air Div., Niagara Falls International Airport, Niagara Falls, N.Y., and the time of designation is continuous.

Mariners are cautioned to consult each U.S. Coast Guard, Ninth District, Notice to Mariners for additional information, firing schedules and changes.

Chart 14804.—East Bay, at the mouth of **Mudge Creek** and about 4 miles to eastward of the entrance to Sodus Bay is small and shallow and closed to lakeward.

Dumping Ground.—About 2 miles northeast of the entrance to Sodus Bay is a dumping ground in more than 50 feet of water. It is about ½ mile square with a least depth of 35 feet. The ground is not marked.

Charts 14804, 14814.—Sodus Bay, N.Y.—This body of water, also known as **Great Sodus Bay,** is situated 29 miles west of Oswego. The main part of the bay is 2½ miles long, ½ to 1½ miles wide, the shores are bold, and the depths run from 18 to 48 feet at ¼ to ⅜ mile from shore generally. In the shallow northeasterly part of the bay are three islands, namely, **Newark, Eagle** and **LeRoy** Islands (formerly known as **Islay, Arran,** and **Bute** respectively). The westerly or bay sides of the first two are deep-to. The bay has a muddy bottom and affords good holding grounds. Although landlocked from Lake Ontario, except for a maintained entrance channel, it is the most capacious and secure anchorage along the New York shore. There is an arm nearly 2 miles long and ½ mile wide in the southeast section of the bay, that affords a controlling draft of 15 feet for an overall distance of 3½ miles from the entrance to the bay into the southeast arm.

There is a low sand spit, **Sand Point,** from 350 to 650 feet wide, extending about 3,300 feet easterly from the west side of the bay at Sodus Point. Its easterly end is ½ mile southeasterly from the inner end of the east pier. The small bight between the north side of Sand Point and the sand bar west of the entrance has depths of only 1 to 4 feet, but at the extremity of the point the water deepens rapidly to 30 feet and over.

Channels.—A dredged channel extends from deep water in Lake Ontario between parallel piers to the bay. The inner end of the east pier extends laterally eastward to Charles Point to enclose the bay. In May 1978, the mid-channel controlling depth was 16 from deep water in the lake except for a shoal with depths of 9 to 15 feet extending from the west channel limit to the channel centerline just north of the west pier.

Aids to Navigation.—Sodus Outer Light is on the outer end of the west pier; a marker radiobeacon is operated at this station.

Sodus Bay East Pier Light 1 is on the outer end of the east pier.

Sodus Bay Light 6 is about midway between the inner end of the piers and Sand Point, and directly ahead when coming in between the piers.

The widened portion of the turn in the bay end of the dredged channel is marked with buoys on the northeast side.

Harbor Facilities.—There are wharves and landings at the village of Sodus Point, N.Y. on the west side of the entrance and approach to the southward of Sand Point. The Penn Central (Pennsylvania Railroad) Co. formerly maintained a channel 19 feet deep and 150 feet wide from deep water in the bay to its former coal trestle southwest of Sand Point. A depth of 19 feet has been obtained along both sides of the trestle (part of trestle removed; remainder remodeled to a smallboat dock) for its outer half and shoals gradually to six feet from the midpoint to shore.

Coast Guard Station.—Sodus Point Coast Guard Station, seasonally operated, is on the west side of the harbor entrance. The station maintains a radio guard during daylight hours, but usually on weekends and holidays only.

Obstructions.—Close to the shore line of the various land areas, and generally within the 6-foot contour in Sodus Bay, there are many obstructions to small boat navigation, including submerged cribs, dock ruins, submerged piles and several ship wrecks.

Submerged Cables.—There is a submerged cable extending from the shore line on Sand Point, northerly to connect the Sodus Bay Light 6 and continuing west and north in line with the west breakwater to connect the lights on the west breakwater.

There are submerged cables extending from the north side of the easterly end of Sand Point, northeasterly to Charles Point; from Charles Point southeasterly to the north end of Newark Island; from the south side of Newark Island, easterly to the northwest part of Eagle Island; from the northeast part of Eagle Island to the south end of LeRoy Island; from the easterly side of Eagle Island easterly to the mainland.

Anchorage Regulations.—See 33 C.F.R. § 110.1 and § 110.86 of Rules and Regulations, preceding.

Chart 14804.—From Sodus Bay the shore line has a generally westerly and slight northerly trend to Pultneyville, about 10¾ miles. The easterly part of this coast is marked by hills, and for about 3 miles westerly of Sodus Point, shoals extend to a distance of about ⅝ mile. Elsewhere the deep water is less than ⅜ mile offshore. Fairbanks Point is a projection about 2 miles eastward of Pultneyville.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The Sodus Point Village waterworks potable water intake crib with 4 feet of water over it, is located in 8 feet of water 6,580 feet 261° from Sodus Outer Light. It is not marked.

The potable water intake line of the Village of Sodus, N.Y., located about 4.5 miles west of the entrance to Sodus Bay, extends about 1,100 feet into the lake to an intake crib with a least depth of 12 feet over it.

Pultneyville, N.Y.—This harbor comprises Salmon Creek and a cove at its mouth, sheltered by a point of land on the west, but exposed to the north and east. There is no traffic except by small recreational craft.

The entrance is between two submerged jetties and is marked by private seasonal buoys and ranges. A marina is in the cove. In May 1977, the controlling depth was reported to be 5 feet in the entrance, with 3 to 5 feet available in the cove and 1½ to 5 feet alongside the marina berths.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A submerged water intake pipe of the town of Williamson, N.Y. extends approximately 2,000 feet lakeward in a northerly direction from a point immediately westerly of the mouth of Salmon Creek, terminating in an intake with a least depth of 15 feet over it. It is not marked.

From Pultneyville the direction of the shore continues west for 6½ miles to **Smoky Point**, thence westerly for about 6 miles to **Ninemile Point**, and thence southwesterly to Irondequoit Bay, a further distance of about 5 miles. The hydrography along this shore is regular and no shoals exist beyond a limit of half a mile.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The town of Ontario Center, N.Y. water intake line, located about 5 miles west of Pultneyville, extends about 1,000 feet into the lake into about 15 feet of water. There is a least depth of 11 feet over the intake crib which is not marked.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline of the Rochester Gas & Electric Corp., R. E. Ginna Nuclear Powerplant, is located about 6½ miles west of Pultneyville, N.Y. The pipeline commences at a point on the shoreline 600 feet 085° from Smoky Point Lighted Tower and extends 2,600 feet 358° to a crib in about 30 feet of water. The least depth over the intake crib is 15 feet and it is not marked.

Sewer Outfall.—A submerged outfall pipeline of the City of Webster, N.Y. starts from the shore just west of Ninemile Point, or approximately 8¼ miles 083° from Rochester Harbor Light, and extends 3,700 feet into Lake Ontario to about 24 feet of water. There is a least depth of 14 feet over the outfall. It is not marked.

Irondequoit Bay is situated about midway between the mouth of the Niagara River and the head of the St. Lawrence River, and about 3½ miles easterly from the Genesee River entrance. It is an irregularly shaped body of water, has hilly shores, and extends inland about 4 miles; it is separated from Lake Ontario by a narrow sand bar about 6,000 feet long and from 200 to 600 feet wide, the crest of which is a few feet above the level of high water in the lake. The water is shallow on both the lake and bay sides of this bar. On the bay side it is shallow for a distance of about 3,500 feet. The distance from deep water in the lake to deep water in the bay is about one mile.

The channel connecting with the lake cuts through the bar about on the axis of the bay. During the summer months this channel is narrow and not more than 1 to 4 feet deep, but during the spring it widens sometimes to 100 feet and deepens to as much as 12 to 15 feet.

Bridges.—There are two fixed bridges across the natural channel between the bay and Lake Ontario in the northwest section of the bay. The lower is a railroad bridge with clear width of 101.4 feet and clear height of 8.2 feet, and the upper is a highway bridge with clear width of 18.6 feet and clear height of 6.5 feet.

A fixed highway bridge having nine spans over the Bay and a clear height of 44½ feet above the bay, extends across the bay generally between Inspiration Point and Massaug Bay about 1½ miles south of the outlet to Lake Ontario.

Chart 14804, 14815.—In the 3½ miles of coast extending in a northwesterly direction from Irondequoit Bay to the mouth of the Genesee River, the maximum extent of the shore-line shoals is about ½ mile. A rock shoal in about 4 feet of water with a least depth of ½ foot over it, is located approximately 3,940 feet 145° from Rochester Harbor East Pier Light. The shoal is marked on the lakeward side by an unlighted buoy.

Submerged Crib.—A submerged crib with a least depth of one foot over lies about 14,060 feet, 127° from Rochester Harbor East Pier Light. The crib is located about 1,100 feet off shore in about 10 feet of water and is not marked.

Sewer Outfall.—The shore terminus of a 120-inch sewer outfall is 9,600 feet easterly of the Rochester Harbor East Pier. The outfall extends 17,864 feet 027°37′00″.

Outfall Pipeline.—The Rochester sewer outlet pipe, located about 1.9 miles southeasterly from Rochester harbor, extends into Lake Ontario about 7,000 feet 021° from shore and terminates at a crib in about 44 feet of water with a least depth of 24 feet over it. It is not marked.

Dumping Ground.—About 1½ miles northeasterly of Rochester Harbor Light is a dumping ground in more than 40 feet of water. It is about ½ mile square with a least depth of 35 feet. The ground is not marked.

Wreck.—There is a submerged wreck in the lake area east of the east pier. The wreck is about 350 feet from the shore on a line of Summerville Dr., extended, and is in about three feet of water and unmarked.

Rochester Harbor, N.Y.—The harbor is at the mouth of the **Genesee River**, 56 miles westerly from Oswego Harbor, and about 7 miles north of the main business district of the city of Rochester. The river is navigable for a distance of about 6 miles above the mouth. The first of a group of dams is located about 7 miles upstream from Lake Ontario. There is no navigable connection between the lower portion of the Genesee River and the New York State Barge Canal which connects with the river about 11 miles upstream from the lake. There is a fall in the surface elevation of the river of more than 260 feet between the Rochester Terminal of the New York State Barge Canal System, and the head of navigation of the lower portions of the river below the dams.

Channels.—The river is entered from Lake Ontario through a dredged channel between two piers, and leads upstream for 2.6 miles above the mouth. There are two turning basins, one just inside the mouth and the other 2 miles above the mouth on the west side of the channel.

In 1974–1977, the controlling depth was 20 feet in the approach channel, thence in 1977, 20 feet at midchannel be-

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tween the piers, thence 19 feet in the lower turning basin except for shoaling to 7 feet at the east edge, thence 17 feet in the upper turning basin with depths decreasing to 7 feet at the west limit and shoaling to bare in the northwest part of the basin, thence in 1976–1977, 10 feet to the upstream limit of the Federal project.

Structures Across the Genesee River

No.	Location and name	Kind	Miles above Rochester Harbor Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Turning basin		.61						Project depth, 23 feet.
2	Con Rail bridge	Railroad	.88	132.1	128.6		10.4		Swing. See note 1.
2A	Submerged cable		.88						
3	Submerged pipelines		.92						Approx. depth 35½ feet. (4 ea. 6″ dia.) (1 ea. 24″ dia.)
4	Submerged pipeline		1.17						Approx. depth 36 feet. (20″ dia.)
5	Submerged cables		1.18						Approx. depth 26 feet. (3 cables)
6	Stutson Street bridge	Highway	1.21			138.0	24.2		Bascule. See note 2.
7	Submerged cable		1.24						Approx. depth 30 feet.
8	Turning basin		2.28						
9	Aerial Cables		2.75				141.0		
9A	Submerged cable		2.84						
	Federal Project Limit		3.08						
	Maintained Channel Limit.		3.83						
10	Submerged outfall pipeline.	Sewer	4.95						Approx. depth 15 feet. (48″ dia.)
10A	Submerged intake pipeline.		4.96						
11	Submerged pipeline		5.09						Approx. depth 12 feet. (36″ dia.)
12	Submerged pipelines		5.17						Approx. depth 20 feet. (2 ea. 18″ dia.) (1 ea. 20″ dia.)
13	Ridge Road bridge	Highway	5.53			300.0	160.5		Fixed arch.
14	Driving Park bridge	do	6.44						Do.
15	Dam		6.53						

Signal for Opening Draws, 1 long, 1 short (— –). Bridge answers with 4 short blasts when draw can not be opened.

NOTE 1.—Red lights are displayed, one at each end of each abutment, one on each side of pivot pier below center line of bridge, and one on each end of center protection pier; three compound red-and-green lights on top of draw span, at center and each end, show red when bridge is closed and green when open. From December 16 to March 31, inclusive, at least 12 hours advance notice is required for opening this bridge. During the remainder of the year the draw will be opened promptly for vessels unable to pass under the closed bridge.

NOTE. 2.—Red lights are displayed, one each on upstream and downstream sides of each abutment; lights on upstream and downstream sides of each lifting end, swinging with lift, show red when bridge is closed and green when open.

Mooring is allowed on the lakeside of the piers only.

Aids to Navigation.—Rochester Harbor Light is located near the outer end of the west pier. A fog diaphragm horn at this light sounds as required. The antenna lead-in of a radiobeacon operated at this station, is located 2,760 feet 202° from the light. East Pier Light is located near the outer end of the east pier. The upper turning basin is marked with buoys.

Harbor Facilities.—The City of Rochester-Port of Rochester has a passenger and freight terminal on the channel and turning basin between Beach Avenue and the ConRail railway bridge. It consists of a concrete wharf 1,275 feet long, with suitable warehouses and unloading facilities. In May 1977, 19 feet was reported alongside.

The Naval Militia has dredged a berthing area immediately downstream from the lower turning basin and adjacent to the east channel limit.

In the area from the mouth of the river to the Stutson Street bridge, a distance of about one mile, many commercial facilities including a variety of small craft services, are available.

Coast Guard Station.—Rochester Coast Guard Station is located on the east side of the harbor entrance.

National Weather Service Warning Display Station.—Signals are displayed from a flag pole at the Coast Guard station, on the east side of the mouth of the Genesee River.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding, and 33 C.F.R. § 117.709 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.185 and § 207.600 of Rules and Regulations, preceding.

Section III.—Southerly Shore from Rochester, N.Y., to Niagara River below Niagara Falls

Regional charts: Chart 14800, Coast Chart 14804; Coast Chart 14805; Coast Chart 14806; Chart 14816; Coast Chart 14822

Charts 14804, 14805, 14815.—Good anchorage is available and a good lee in westerly winds is found in the area between the mouth of the Genesee River and Braddock Point, about 7 miles northwest. Adequate depths are found within one mile offshore. The land here is low and the shoreline consists in large part of bars inclosing a series of shallow ponds or enlarged outlets of creeks.

Water Level Gage Intake.—A water level gage of the National Ocean Survey is located on the shoreline opposite the Monroe County Water Authority. An intake pipeline from the gage house commences on the shoreline at a point 7,380 feet 285° from Rochester Harbor Light, and extends 1,130 feet 035°. The end of the pipeline has a depth of 7 feet of water over it and it is not marked.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The Monroe County Water Authority intake pipes, located about 1.4 miles northwesterly from Rochester Harbor, extend into Lake Ontario about 4,000 feet from shore and terminate at 2 intake cribs, 100 feet apart, with a least depth of 21 feet over them. They are not marked.

Water Intake.—The Rochester Gas and Electric Corp.'s intake pipe, located 900 feet west of the above-described intake pipes, terminates in a crib having a depth of 21 feet over it. It is not marked.

Chart 14804.—Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The Eastman Kodak Co.'s 42 inch water intake pipes, located about 2.3 miles northwesterly from Rochester Harbor, extend into Lake Ontario about 7,800 feet from shore and terminate at 2 intake cribs, 700 feet apart, with a least depth of 26 feet over the easterly crib and 36 feet over the westerly crib. These cribs are not marked.

The Monroe County Water Authority potable water intake pipes, located about 600 feet westerly of the Eastman Kodak Co.'s intake pipes, extend about 8,091 feet into the lake terminating in a crib having a depth of 39.6 feet over it.

Construction Operations.—An 84-inch sewer outfall pipeline of the Northwest Quadrant Pure Waters District No. 1 is being constructed at a point about 8½ miles west of Rochester Harbor, N.Y. The pipeline will extend 4,640 feet lakeward of the existing shoreline to a diffuser with 27 feet over the diffuser.

Chart 14805.—Braddock Bay, N.Y.—Braddock Bay is located just southeast of Braddock Point. It is a body of water about one mile long and separated from Lake Ontario by long necks of land extending from the southeast and from the northwest with an entrance between. Braddock Bay Entrance East Light, 20 feet above the lake, mounted on a white column, marks the southeast side of the entrance. Braddock Bay Entrance West Light, 20 feet above the lake and mounted on a white column, marks the west side of the entrance. The lights are located about 3½ miles 127°30′ from Braddock Point Light. A small-boat basin is in the southeast corner of the bay. In May 1977, the controlling depth across the entrance bar was reported to be 2 feet, with 4 to 5 feet available alongside the piers in the basin.

Outfall Pipeline.—An outfall pipeline commences from a point on shore 6,400 feet 120° from Braddock Point Light and extends 4,640 feet 015°22′ to a diffuser. There is a depth of 30 feet over the diffuser and it is unmarked.

Braddock Point Light (so-called) is located on Bogus Point, which is about 2¾ miles northwesterly from Braddock Point; the shallow border in this distance extends about 1 mile offshore.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The Village of Hilton waterworks intake pipeline is located about 1⅜ miles west of Braddock Point Light. The pipeline commences at a point on the shoreline 7,200 feet 268° from Braddock Point Light, and extends 1,200 feet 007° to the intake. There is a depth of 13 feet of water over the intake itself. There is no marker on the structure.

West of Braddock Point Light, at a distance of 2 miles, a boulder bank extends about ¾ mile from the shore with rocks just below the water surface near its outer edge. Northeasterly about ⅜ mile from the outer end of this bank and one mile offshore, a **wreck** is shown on the charts, lying northwesterly 1⅞ miles from Braddock Point Light.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The Brockport, N.Y. potable waterworks intake is located 8 miles west of Braddock Point Light. The pipeline extends 2,600 feet 000° to a crib in about 23 feet of water. There is a depth of 18 feet over the crib and it is not marked.

The coast to **Devils Nose**, a small bold knob 11 miles westerly of Braddock Point Light, is clear at ½ mile offshore except for a somewhat greater extension of the bank about ¾ mile to eastward of Devils Nose, with a 7-foot spot ⅜ mile from shore. The 11-mile stretch of shore from Devils Nose westerly to Oak Orchard has no offlying obstructions beyond a limit of ⅜ mile until within 2 miles of the latter place, where the rocky bank attains a maximum extent of ¾ mile and on which there is an 8-foot spot, ½ mile from the shore and 1¼ miles east of the piers.

Oak Orchard, N.Y.—The harbor is at the mouth of **Oak Orchard Creek.** The approach to the creek from Lake Ontario is through two dredged channels which lead around either end of a detached breakwater, join, and lead southward between two jetties through the mouth of the creek to a harbor basin with its upper end about 0.2 mile above the mouth. In 1976, the controlling depths were 5½ feet in the west approach channel and 5 feet in the east approach channel, thence in 1977, 9 feet at midchannel in the jetty channel with 8 feet in the basin except for shoaling along the edges.

Marine facilities for small craft are available at several locations in the creek.

Aids to Navigation.—The detached breakwater has lights on the center, east and west ends. The jetties are marked by lights on their outer ends.

Bridges.—Twin fixed highway bridges about 0.8 mile south of the detached breakwater have a vertical clearance of 54 feet. A fixed highway bridge about 1.7 miles south of the detached breakwater has a vertical clearance of 8 feet.

Caution.—In May 1977 it was reported that there have been several groundings on the detached breakwater when entering at night. Local knowledge is advised.

From Oak Orchard to Thirty Mile Point, a distance of 15 miles, the coast continues its westerly trend and is bordered by rocky and stony shoals to from ¼ to ⅝ mile off; the greatest extent being between points 2¾ and 3¾ miles east of Thirty Mile Point, where depths of 6 to 8 feet exist ½ mile from the shore.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The Village of Albion potable water intake pipe, located about 1 mile west of the mouth of Oak Orchard Creek, extends into Lake Ontario about 1,750 feet from shore and terminates at an intake crib with a least depth of 14 feet over it. The crib is not marked.

The potable water intake pipe of the village of Lyndonville, N.Y., located about 10 miles west of Oak Orchard Harbor, extends into Lake Ontario about 530 feet from shore and terminates at an intake crib with a least depth of 6 feet over it. It is not marked.

Charts 14806, 14805.—Thirty Mile Point Light on **Thirty Mile Point,** stands close to the water's edge on a slightly projecting point about 30 miles to eastward of the mouth of the Niagara River. A radio mast is located 50 feet southwest of Thirty Mile Point Light.

Chart 14806.—From Thirty Mile Point the coast trends southwesterly for about 12 miles to Olcott, thence about 6⅛ miles to Wilson, and continues southwesterly for about 12¼ miles to the mouth of the Niagara River. For a little more than 14 miles westerly from Thirty Mile Point, there is deep water to within ¼ mile of the shore, but about 2¼ miles westward of Olcott the offshore bank attains an extent of ⅝ mile and this character practically continues to the vicinity of the mouth of the Niagara River.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The village of Barker, N.Y., potable water intake pipeline located 3½ miles west of Thirty Mile Point Light, extends 600 feet 000° into the lake, with a least depth of 6 feet over the crib. It is not marked.

Caution Areas.—There are two caution areas in United States waters in the section of shore line from Rochester, N.Y. to the International Boundary: (1) In the United States waters, an area extending nearly the entire length of the section and having a maximum width of about 10 miles, located adjacent to the International Boundary is used for aerial gunnery, bombing, and rocket training operations; (2) In United States waters, an area just west of Wilson, N.Y. and extending about 5 miles off shore, extensive bombing training will be conducted. Mariners are advised to consult Local Notices to Mariners for the latest information on schedule of operations, limits of the areas, and instructions.

Dumping Ground.—About 1½ miles north of Olcott, N.Y. is a dumping ground in more than 70 feet of water. It is about ½ mile square with a least depth of 35 feet. The ground is not marked.

Olcott Harbor, N.Y.—This village is located at the mouth of **Eighteenmile Creek.**

Channels.—The creek is entered from Lake Ontario through a dredged channel between two piers. In 1974–1976, the controlling depth was 8½ feet in the dredged channel. The channel is unstable however, due to the deposit of mud carried by Eighteenmile Creek and the drifting of sand from the west. A rock ledge across the entrance channel 500 feet lakeward of the piers has a least depth of 10 feet.

Aids to Navigation.—Olcott Light is located near the outer end of the west pier.

Harbor Facilities.—The Olcott Yacht Club is located on the west side of the harbor at the inner end of the

west pier. About 1,300 feet upstream of the shore end of the east pier, the New York State Route 18 bridge crosses Eighteenmile Creek, and about ¾ mile further upstream is the next bridge. Most small craft facilities including hoists are available in the harbor.

Aerial Cable.—A telephone aerial cable crosses Eighteenmile Creek 750 feet north of the Route 18 bridge. Vertical clearance under the cable is 56 feet.

Bridge.—The New York State Route 18 highway bridge was completed in 1970. This bridge has a horizontal clearance of 123½ feet and a vertical clearance of 52.1 feet at Low Water Datum.

Water Intake.—An abandoned water intake pipeline is located just west of the entrance to Olcott Harbor. The pipeline commences on the shore at a point 2,100 feet 255° from Olcott Light, and extends 650 feet 000° to a crib in about 11 feet of water. There is a depth of 7 feet of water over the crib and it is not marked. This facility is being used by the National Ocean Survey as a water level gaging station and mariners should not anchor or deposit refuse in the vicinity of the pipeline or the intake.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The village of Wilson, N.Y., (abandoned) potable water intake pipeline commences at a point on the shore 2,500 feet 095° from Wilson Harbor Pierhead Light, and extends 400 feet 345° to a crib in about 3 feet of water. It is not marked.

Charts 14806, 14822.—Wilson Harbor, N.Y.—This harbor is located in the mouth of **East Branch Twelvemile Creek**, distant by water 67 miles westerly from Rochester Harbor and 12 miles easterly from the mouth of the Niagara River. The widened mouth of the creek forms Tuscarora Bay which is about 2 feet deep in its natural depth, and provides good anchorage for shallow draft vessels.

Channels.—The entrance to the harbor from Lake Ontario is through a dredged channel that leads between parallel piers and thence upstream for 0.8 mile through Tuscarora Bay. In 1977, the controlling depth was 6 feet in the entrance channel and the channel through Tuscarora Bay.

Aids to Navigation.—Wilson Harbor Pierhead Light 2 is located 30 feet above the lake, on a red skeleton steel tower on the outer end of the west pier. A number of daybeacons outline both sides of the channel in Tuscarora Bay.

Harbor Facilities.—There are several yacht clubs, and other marine service facilities in the bay proper including a pump-out facility and a mobile hoist for small craft.

Submerged Pipelines.—A pipeline extends from a point on the shore 850 feet 144° from Wilson Harbor Pierhead Light, 680 feet 346° into about 5 feet of water. Two pipelines cross the bay, one at the public dock and another about 1,800 feet upstream of the public dock. They are not marked.

Aerial Cables.—Aerial cables with clearances of 76 feet and 75 feet across the bay about 1,000 feet and 3,200 feet, respectively, upstream of the public dock.

Obstruction.—A submerged rock about one foot below the water surface is marked by a buoy located 25 feet lakeward of the rock in 7 feet of water, 18,900 feet 249½° from Wilson Harbor Pierhead Light.

Charts 14806, 14822, 14816.—Shoals off Niagara River.—The area off the mouth of the Niagara River has extensive shoals within a radius of about 3 miles. In this area, from the east side of the mouth of the river, a bank extends off over ¾ mile inside the 18-foot contour; it is marked at its northwesterly extremity by a lighted bell buoy (1) located about 1 mile 315½° from Fort Niagara Light. Fort Niagara Light is on the high east bank of the river, ¼ mile from the mouth. Rumsey Shoal, with 17 feet least depth, lies farther out about due north and about 1¾ miles from the light. Also in the area, Niagara Bar lies northerly and northwesterly of the mouth of the river and must be avoided by vessels bound to and from the Welland Canal and points to the eastward. Niagara Bar has outlying spots of 12 and 13 feet and spots closer to shore west of the river mouth as shoal as 8 feet. Niagara Bar lighted buoy is located 3⅞ miles 352½° from Fort Niagara Light. A gong buoy (4), one mile south of the lighted buoy and about 2.9 miles 350° from Fort Niagara Light, marks the most easterly extremity of the 18-foot contour of the shoal area. From this extremity, the bar extends southwesterly across the alinement marked by the Niagara River entrance range lights to the shore. Commercial sand and gravel dredging is conducted intermittently in the area and the depths are subject to change.

Niagara River Below Niagara Falls.—The lower Niagara River is navigable from its mouth, in Lake Ontario, to Lewiston (at the foot of the Lower rapids), a distance of 7 miles and has an unobstructed channel from 1,500 to 2,000 feet wide and 30 to 70 feet deep.

The entrance into the lower river is between the land points in New York State and the Province of Ontario occupied respectively by Fort Niagara, N.Y. on the east, and Fort Mississauga, Ont. on the west.

The International Boundary Between the U.S. and Canada follows a general middle of the river course through the lower Niagara River.

Fort Niagara, N.Y.—Fort Niagara Light (43°15.7′N., 79°03.6′ W.), 91 feet above the water, is shown from a 65-foot gray octagonal tower, upper part yellow, at Fort Niagara.

Coast Guard Station.—Niagara Coast Guard Station is located on the east side of the Niagara River entrance. The Coast Guard wharf is about 150 feet long, with an available depth of 14 feet reported in May 1977.

Niagara-on-the-Lake, Ontario, located on the west side of the mouth of the river opposite Fort Niagara, N.Y., is 32 miles southeasterly from Toronto and 7½ miles northeasterly from Port Weller.

The Niagara River entrance range lights are located at Niagara-on-the-Lake and consist of two fixed red lights, bearing 149° 30′ across Niagara Bar. The front light tower stands near the southeast corner of the former Canada Steamship Lines wharf. The back tower stands on the shore, 690 feet 149°30′ from the front light.

At the prevailing stages during the navigation season,

a draft of 13 feet may be carried into the river by closely following the range. An alternative course for entering may be had by heading in on the bearing, 187°, passing the gong buoy close-to on the starboard hand and the lighted bell buoy close-to on the port hand, then swinging for the river when the range comes on.

Fort Mississauga Light is exhibited 30 feet above water on a white circular tower with a red top, established under the ramparts of Fort Mississauga at Niagara-on-the-Lake.

Harbor Facilities.—A Canadian Federal Government Customs Wharf is located at Niagara-on-the-Lake. The wharf extends approximately 20 feet into the Niagara River and has a 53-foot long front face parallel to the shoreline. The area in front of the wharf has been dredged to 11 feet but due to shoaling this depth is not necessarily available at all times.

Small craft facilities, including fuels and services are also available.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is located at Niagara-on-the-Lake.

Youngstown, N.Y., located about one mile above the mouth of the river, has small docks and boat works for pleasure craft with storage facilities, marine supplies and gasoline as well as dockage for transient boaters at the Fort Niagara Yacht Club.

Anchorage Regulations.—See 33 C.F.R. § 110.1 and § 110.85 of Rules and Regulations, preceding.

Water Intake.—There is a water intake on the east side of the Niagara River above Youngstown. The intake pipeline commences at a point on the shore 13,100 feet 183° from the tank in Youngstown, and extends 350 feet 294° to an intake crib in more than 30 feet of water. There is a depth of 24 feet over the intake crib and it is not marked.

A second intake pipeline is located about 250 feet south of the pipeline noted above. The intake pipeline commences at a point 13,300 feet 183° from the tank in Youngstown, and extends 300 feet 268° to an intake in more than 30 feet of water. There is a depth of 24 feet over the intake crib and it is not marked.

Submerged Pipeline.—A submerged pipeline commences on the shore at a point 17,400 feet 178° from the tank in Youngstown, and extends 1,800 feet 242° to the Ontario shore. It is not marked.

Water Intake.—There is a water intake on the east side of the river just upstream of the submerged pipeline noted above. The intake pipeline commences at a point 17,800 feet 178° from the tank in Youngstown, and extends 400 feet 273° to an intake crib in more than 30 feet of water. There is a depth of 27 feet over the intake and it is not marked

Canadian Anchorage Area.—An anchorage area is located on the west side of the Niagara River, 2 miles above the mouth, off St. Catharines Boat Club. It is marked by private buoys on the outer limits.

Lewiston, N.Y., is at the head of the navigable portion of the lower Niagara River, about 7 miles above the mouth. It has connection by bus with Fort Niagara to the north and Niagara Falls to the south. The Village Dock has a 250-face with depths of 12 feet reported alongside in May 1977. The dock is in poor condition.

Queenston, Ontario, is about opposite Lewiston. The D. G. Bawtinheimer, Ltd. Dock is a 300-foot wharf with depths of 12 feet reported alongside in May 1977.

The lower Niagara River reach upstream from the Lewiston, N.Y.—Queenston, Ont. area, is considered not navigable because of a heavy rapids section extending more than 4 miles. Above the rapids section, the river extends for about 2 miles further upstream to the upstream end of the lower Niagara River, passing west of the base of the American Falls to the base of the Horseshoe Falls.

In this reach of the river, there are 4 bridges and 2 aerial cables.

Section IV—Canadian Harbors Around the Lake Ontario Shore from the Niagara River to the Head of the St. Lawrence River

Regional charts: Chart 14800; Coast Chart 14806, Coast Chart 14822.

Charts of Canadian waters are prepared by the Canadian Hydrographic Service, Department of the Environment, Ottawa, Canada

Charts 14806, 14822.—From the Niagara River, which marks the International boundary, the Canadian Coast extends westerly for about 2¾ miles, from which point the direction is southwesterly for about 11½ miles, to 3½ miles beyond Port Dalhousie. From the turn west of the Niagara River, there is deep water within ¾ mile of the shore to the area of the breakwaters at the entrance to the Welland Canal, a distance of about 7½ miles from the Niagara River, where the offshore bank attains an extent of 1¼ miles, again decreasing towards and in the bight beyond Port Dalhousie. Port Weller, the Lake Ontario terminus of the Welland Ship Canal, is about 3 miles east of Port Dalhousie. From the bight beyond Port Dalhousie to Burlington Bay at the west end of the lake, a distance of about 25 miles northwesterly, the shoal border is from 1 to 1¼ miles wide.

Caution Area.—Niagara-on-the-Lake—Small Arms Range.—A Canadian Land Forces Exercise Area is located just west of the mouth of the Lower Niagara River. The firing area extends over Lake Ontario within the following coordinates: 43°16′07″ N., 79°07′08″ W.; 43°16′25″ N., 79°06′42″ W.; 43°16′03″ N., 79°06′12″ W.; 43°15′37″ N., 79°05′51″ W.; 43°15′33″ N., 79°06′12″ W.; 43°15′45″ N., 79°06′39″ W. This area is only in use intermittently and the period of use will be announced by local Ministry of Transport "Marine Radio Broadcast" and may also be advertised in local newspapers.

Aids to Navigation.—The master of any radiotelephone-equipped vessel approaching Port Weller harbor from Lake Ontario shall telephone radio station VDX22 (Sea-

way Welland) on frequency 156.8 MHz when his vessel approaches the black and white vertical striped reporting buoy, equipped with radar reflectors and showing a flashing white light, 2½ miles 006° (true) from Port Weller Outer Light, and inform the Traffic Controller as to his destination. Frequency 156.8 MHz shall be used for calling and safety purposes only, and for all further conversation, frequency 156.7 MHz shall be used.

Masters of vessels equipped with radio telephone shall, unless otherwise instructed, guard channel 14 (156.7 MHz) from calling-in-point 15 to calling-in-point 16, and vice versa.

Prohibited Anchorage Area.—His Excellency the Governor General in Council, on the recommendation of the Minister of Transport, pursuant to subsection (4) of section 645 of the Canada Shipping Act, is pleased hereby [Canada Gazette, Part II, Volume 99 (page 484) dated April 14, 1965, No. 7] to make the annexed Welland Canal Entrances Anchorage Regulations.

Welland Canal Entrances Anchorage Regulations

1. These Regulations may be cited as the Welland Canal Entrances Anchorage Regulations.

2. In these Regulations,

(a) "Minister" means the Minister of Transport; and

(b) "prohibited waters" mean the waters of Lake Ontario and Lake Erie, in the Province of Ontario described as follows:

(i) Lake Ontario: beginning at a point north of the Port Wellar Entrance to the Welland Canal located at Lat. 43°14′40″ N., Long. 79°13′40″ W., as shown on Canadian Hydrographic Chart 2000*, THENCE in a 090° direction one statute mile approximately to a position located at Lat. 43°14′40″ N., Long. 79°12′28″ W., THENCE in a 009° direction three statute miles approximately to a position located at Lat. 43°17′16″ N., Long. 79°11′50″ W., THENCE in a 270° direction two statute miles approximately to a position located at Lat. 43°17′16″ N., Long. 79°14′15″ W., THENCE in a 171° direction three statute miles approximately to the point of beginning, and

(ii) (See Lake Erie—Port Colborne.)

3. No person shall anchor a vessel within the prohibited waters unless authorized by the Minister.

4. (1) Every person who contravenes or fails to comply with these Regulations is guilty of an offence and is liable on summary conviction to a fine not exceeding five hundred dollars.

(2) The owner, charterer, hirer, master, operator or person in charge of a vessel that is anchored contrary to these Regulations shall be deemed to have contravened these Regulations unless, in any prosecution therefor, he establishes that the contravention took place without his knowledge or consent or that he exercised all due diligence to prevent it.

Anchorage Area.—In order that vessels entering or leaving Port Weller may not be obstructed by vessels which are anchored awaiting permission to transit the Canal, or for other causes, a triangular shaped Anchorage Area west of the breakwaters has been defined within a line joining the following positions: (a) Lat. 43°14′24″ N., Long. 79°14′30″ W.: (b) Lat. 43°14′48″ N., Long. 79°18′54″ W.; (c) Lat. 43°12′00″ N., Long. 79°18′54″ W. Vessels which have to anchor for any reason off Port Weller are requested to do so in the above defined area and in no case to anchor northwards of a line joining positions (a) and (b).

Pilotage Regulations.—See 46 U.S.C. 216–216i published in Certain Laws, preceding, and 46 C.F.R. § 401 (in part) of Rules and Regulations, preceding.

Pilot Dispatch Offices.—The St. Lawrence River and Lake Ontario, in Great Lakes Pilotage Authority, are serviced by the following dispatch offices:

Great Lakes Pilotage Authority, Ltd.
P.O. Box 95
Cornwall, Ontario, Canada
613–933–2991
Great Lakes Pilotage Authority, Ltd.
P.O. Box 2008, Station B
St. Catherines, Ontario, Canada
416–934–2921

For vessels requiring pilotage service, the nearest pilot dispatch office is notified 12 hours ahead with a follow-up confirmation 4 hours in advance.

Port Weller, Ontario.—This harbor is the Lake Ontario terminus of the Welland Canal and is situated about 7½ miles west of the mouth of the Niagara River.

Improvement Works.—The harbor consists of two parallel breakwaters of earthwork and reinforced concrete cribwork, built about 1,200 feet apart, except at the north end where they converge to form an entrance 400 feet wide. Between the breakwaters, the channel has been dredged to a depth of 27 feet over a width of 800 feet. The limits of the dredged area are marked by buoys.

On each side of the harbor entrance there is a concrete pier 600 feet long, including the pierhead at its outer end. The centerline of the entrance bears due south, as does that of the harbor for a distance of 7,000 feet from the entrance pierhead, at which distance the centerline deflects about 15° to the east so as to coincide with the alinement of Lock 1, situated 2,500 feet farther on.

Small craft accommodation is located on the east side of the entrance to the Welland Canal. Facilities include fuel and a repair shop. Protection is provided by a 400-foot long rubble mound breakwater, with light on the outer end.

Aids to Navigation.—Port Weller Outer Light is shown on the outer end of the west breakwater at the entrance; a fog horn sounds as required; a radiobeacon is operated 200 feet from the outer end. A light also marks the outer end of the east breakwater at the harbour entrance. Range lights for entering the harbour are located at the southerly end of the Port Weller Harbour, bearing in line with the center of the outer piers; the front light is located about 7,810 feet 178°10′ from the Outer Light

*Also Chart 2063.

and the rear light (yellow sector preferred channel) is located 2,975 feet 180° from the front light.

Welland Canal, Ontario.—This canal was constructed in the years 1913 to 1932 to supersede the former third canal which restricted the size of vessels passing between Lake Ontario and the upper lakes. It crosses the Niagara peninsula generally in a north-south direction between Port Weller on Lake Ontario and Port Colborne on Lake Erie, and is under the jurisdiction of the St. Lawrence Seaway Authority of Canada.

Welland By-pass Channel.—The new 8½ mile Welland By-pass channel between Ramey's Bend and Port Robinson is completed and was opened for navigation at the beginning of the 1973 season.

The canal is 27 miles long, with prism having generally a width of about 200 feet at the bottom except the new Welland By-pass which generally has a width of about 350 feet at the bottom; the present controlling depth is 27 feet with a permissible draft of 26 feet. There are 8 locks, comprising 7 lift locks located in the northerly one-third of the total length at and below Thorold, and one guard lock about 1½ miles north of the Port Colborne entrance. The lifts vary from 43.7 to 47.9, aggregating 327 feet total lift. The depth over the lock sills is 30 feet and the dimensions, with lengths between inner gates, are as follows: Lock No. 1 at Port Weller, 865 feet by 80 feet; Locks Nos. 2 to 7, inclusive, 859 feet by 80 feet; and guard lock No. 8 at Port Colborne, 1,380 feet by 80 feet, but the recommended usable lengths are determined by gate fenders, breast walls, and stop signs. Every vessel that does not exceed 730 feet in overall length and 75 feet 6 inches in extreme breadth, including permanent fenders, may transit during the navigation season. Locks Nos. 4, 5, and 6 are twin locks in flight, overcoming the steep rise between Merritton and Thorold known as the Niagara escarpment, and permitting uninterrupted passage upbound and downbound traffic.

The canal is crossed by 12 bridges, 4 of which are railway bridges and the remainder highway bridges. Two road tunnels cross under the canal, one at Thorold south of Lock 7 and one at the By-pass channel north of Mile 18. A road-rail tunnel also crosses under the By-pass channel south of Mile 20. The overhead clearance above the normal water surface is 120 feet and is governed by vertical lift bridges. The maximum height of mast permissible on ships transiting the canal is 117 feet; however, authentic information on height of masts over 110 feet must be furnished the Officer-in-Charge before the vessel enters the canal. The horizontal clearance is governed by width in the locks. All locks, movable bridges, and other structures are electrically operated, and the entire canal zone is electrically lighted.

NOTE. Mariners are cautioned to obtain copies of the following pamphlets: (a) Seaway Handbook, (b) Canadian Hydrographic Chart 2042, Welland Canal, (c) Notices to Shipping, (d) Information for vessel transit, the St. Lawrence Seaway. It is mandatory that masters of vessels on the canal be in possession of and familiar with the contents of these publications.

The Seaway Handbook can be obtained from Information Canada, Ottawa (Price $7.50 Canadian funds); the navigation chart from the Canadian Hydrographic Service, Department of the Environment, Ottawa; and the Notices to Shipping and vessel transit information booklet from the lockmaster at Lock 1 or Lock 8.

Every vessel must be pre-cleared by its representative with the Authority before transiting the Seaway. Preclearance shall be arranged through the St. Lawrence Seaway Authority Headquarters in Cornwall, Ontario. Pleasure craft of less than 350 tons do not require preclearance. No pleasure craft of less than 20 feet in overall length, or one ton in weight, is permitted to transit the canal.

Tolls.—For schedule of lockage charges on the Welland Canal, see the St. Lawrence Seaway Tariff of Tolls.

Welland Canal Regulations

A—Vessels Provided With Radio Transmissions: The Traffic Superintendent at Seaway Welland, is in control of navigation throughout the Welland Canal, and dispatching of vessels will be subject to his instructions supplemented by instructions transmitted by lockmasters.

Whenever an approaching vessel arrives at CIP (Calling-In-Point) 15 or CIP 16 it must call Seaway Welland on Channel 14, 156.7 MHz. It shall inform the traffic controller thereof of its destination. The traffic controller will then obtain the particulars required before transit is permitted and will give the necessary dispatch information to the vessel. The Traffic Controller is kept fully informed, by land line communication and closed circuit television of the position of all vessels as they pass bridges or leave the locks. Any vessel tied up at a wharf within canal boundaries must get clearance from the traffic controller before casting off.

Masters of vessels equipped with radio-telephone are to maintain the radio-telephone system available for receiving calls from Seaway Welland for the whole period from when the vessel comes within a range of 3 miles of the entrance of the canal until the vessel clears the canal.

The following channels have been assigned to this station for controlling movement of vessels in the Welland Canal and its approaches:

Seaway Welland (FM) (50 watts) Welland Canal radiotelephone located at the Vessel Traffic Control Centre at the Western Region H.Q. in St. Catharines near Lock 4, is licensed for controlling movement of vessels in the Welland Canal and its approaches on the following channels:

156.7 MHz—For communication with ships.

156.8 MHz—For calling and distress purposes only.

This station is continuously attended during the navigation season.

C—Fog conditions: Information regarding fog conditions between Thorold and Port Colborne may be obtained by calling Seaway Welland on the radiotelephone.

F—Velocity of Current in Canal: Due to the flow of water for power purposes, there is an average velocity of about one mile per hour between Lock 8 and the Hydro-Electric Power Commission intake north of Bridge 11. A cross current towards the west exists 500 feet south

of Bridge 11 and also at the entrance to the former Third Welland Canal channel north of Bridge 11. Masters of vessels are accordingly warned to guard against being drawn over to the west at these locations.

G—Handling Vessel Lines in Locking: When locking, vessels shall be moored at the west wall of Locks 1 and 8, at the east walls of Locks 2, 3, and 7 and at the center wall of Locks 4, 5 and 6.

NOTE.—Navigation lights governing the approach and entry of vessels in a lock is contained in the booklet "Information for Vessel Transit," dated 1971.

H—Speed of Vessels: The maximum speed of vessels in the Welland Canal is as follows:

For all vessels, 7 miles per hour over the bottom, except Port Weller Harbour from Lock 1 to outer piers and the Welland By-Pass Channel from Port Robinson (bridge 12) to Rameys Bend maximum speed 9 miles per hour (7.8 knots) over the bottom.

I—Passing Moored Vessels: The attention of masters of all vessels in the Welland Canal is called to Regulation 28 (3) of the Seaway Handbook, respecting the passing at slow speed any vessels moored to a wharf, pier, bank, etc. Regulation 28 (3) also applies to the harbors of Port Colborne, Port Weller and Port Dalhousie. The observance of this Rule is vitally important when passing an oil tanker discharging or taking on cargo.

Port Dalhousie, Ontario.—This town was formerly the Lake Ontario terminus of the Welland Canal. The town of Port Dalhousie has been combined with the city of St. Catharines. In the approach to the harbor, a cut, the sides of which are nearly in alinement with the entrance piers, has been dredged to a depth of 18 feet for a distance of about 1,500 feet north of the outer end of the east pier.

The entrance to the harbor is between two parallel piers, 200 feet apart. The east pier, 2,300 feet long, extends out 1,500 feet from the shore, 250 feet beyond the outer end of the west pier. The channel between the piers is about 75 feet wide and is reported to have a depth of 19 feet with least depths of 10 and 12 feet adjacent the channel, near the east and west piers, respectively. A range of lights 1,500 feet apart on a bearing of 177°, are located as follows: The front range light, visible but only on the azimuth of the range, is at the outer end of the east pier; and the rear range main light is located on shore near the inner end of the east pier.

Chart 14800.—Caution Area.—Grimsby Small Arms Range.—A Canadian Land Forces Exercise Area is located at **Fifty Mile Point,** about 20 miles west of Port Weller and about 3.4 miles northwest of **Grimsby, Ontario,** and extends 9,500 feet lakeward from 43°12′56″ N., 79°37′14″ W. through an arc of 018° from 021° through 039°. This area is only in use intermittently and the period of use will be announced by local Ministry of Transport "Marine Radio Broadcasts" and may also be advertised in local newspapers.

Submerged Pipelines.—A submerged pipeline commences on the shoreline 15,600 feet 156° from the outer end of the south pier of Burlington Canal and extends 2,700 feet 055½° to an intake crib in about 30 feet of water. It is not marked.

A submerged pipeline commences on the shoreline 15,800 feet 156° from the outer end of the south pier of Burlington Canal and extends 2,500 feet 057½° to an intake crib in about 32 feet of water. It is not marked.

A submerged pipeline commences on the shoreline 16,600 feet 155½° from the outer end of the south pier of Burlington Canal and extends 2,000 feet 057½° to an intake crib in about 32 feet of water. It is not marked.

Hamilton Harbour, Ontario.—A naturally land-locked bay and harbor, approximately 4½ miles long and 3 miles wide, situated at the extreme west end of Lake Ontario and separated from it by a narrow neck of sand varying in width from 250 to 1,000 feet, through which the Burlington Canal is cut. (Hamilton Harbor is also known as Burlington Bay.) Hamilton Beach is south of the canal and Burlington Beach is north of the canal.

The city of Hamilton, Ontario, is located on the southerly side of Hamilton Harbour. The only entrance to the harbor is through Burlington Canal. Copies of the By-laws for the control of the harbour at Hamilton, may be obtained on application to the Port Director, Hamilton Harbour Commissioners, Hamilton, Ontario.

Vessels entering, leaving, or changing berth within Hamilton Harbour will proceed with utmost caution, having due regard for other vessels moving in the harbour.

The Hamilton Harbour Master's office operates a communications centre as a twenty-four hour operation (as of Sep. 1972) daily during the navigation season for emergency, safety, and operational requirements. Ships entering Hamilton Harbour may contact the Hamilton Harbour Master's Office for information by radiotelephone, Hamilton call sign XJF-496, on frequencies 2182 kHz or 156.8 MHz—Safety and Calling, and 2003 kHz or 156.6 MHz—Working, and 156.7 MHz—Alternate Working.

Improvement Works.—The Burlington Canal, dredged from the lake to the bay, is about 1 mile long and is protected for about 2,700 feet of its midlength by two parallel piers. It is 300 feet wide throughout. The canal has been dredged to least depth of 30 feet throughout its length, with the exception of 30-foot wide berms left along each pier facewall.

In 1973, a controlling depth of 29 feet was indicated on the chart.

A new combined highway and railway vertical lift bridge crosses the canal near its centre. Clearance with bridge closed is 10 feet and clearance with the bridge fully raised is 120 feet. Red and green navigational lights are located on either side of the bridge at mid-channel and on both the lake and harbour ends of the South pier. Control of the signal lights on the outer or lake side of the bridge is independent of those on the inner or harbour side so as to allow passage through the channel in only one direction at a time. White clearance lights have been installed on North and South piers di-

rectly under the new bridge to define the limits of the canal.

In addition to the above signal lights, flashing blue navigation lights have been installed on the South pier on each side of the new bridge for the control of pleasure craft.

As well as the combined highway-railway lift bridge, there is also the Burlington Bay Skyway, a high-level bridge with a vertical clearance of 120 feet, which spans the canal about 300 feet further westward.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is located at Hamilton Harbour.

Aids to Navigation.—A fairway buoy is moored in Lake Ontario 1 mile 053° from the light on the outer end of the south pier.

A light, a tyfon foghorn, a sequenced radiobeacon and a ship calibrating radiobeacon are located on the outer end of the south pier. There is a light on the east end of the north pier.

The main light, on the south tower of the railway bridge is 1,500 feet 234° from the front light on the easterly end of the south pier.

On the inner end of the south pier, 1,500 feet from the main light, a light is shown as a guide to the canal from the bay. There is a light on the west end of the north pier.

Vessels requiring entry to and passage through the channel shall be governed by the following regulations:

Regulations Respecting Navigation in the Burlington Canal.

1. These Regulations may be cited as the Burlington Canal Regulations.

2. In these Regulations,

(a) "bridge" means the lift bridge over the canal; and

(b) "canal" means the Burlington Canal between Lake Ontario and Hamilton Harbour.

3. No vessel shall move in the canal at a speed greater than,

(a) If the vessel is not over two hundred and sixty feet in length, eight miles per hour; or

(b) If the vessel is over two hundred and sixty feet in length, the lowest speed at which the vessel can be navigated safely.

4. (1) No vessel shall, while moving within one half mile of the canal towards the canal, pass another vessel going in the same direction.

(2) Subsection (1) does not apply in respect of vessels less than fifty feet in length.

5. Where a vessel requires the bridge to be opened, a request shall be made to the bridgemaster by radiotelephone or, if such communication is not possible, the vessel shall sound three long blasts on the whistle or horn.

6. (1) No vessel fifty feet or more in length shall enter the canal, except in an emergency, until the signal light on the bridge shows green in the direction of the vessel.

(2) Where a vessel fifty feet or more in length enters the canal while the signal light does not show green in its direction, it shall moor at the north wall of the canal and shall not proceed until the signal light shows green in its direction.

7. (1) No vessel less than fifty feet in length shall move nearer than three hundred feet from the bridge unless the bridge is opened or until a flashing blue light is shown in its direction.

(2) Where a vessel less than fifty feet in length enters the canal while the bridge is not opened and while the flashing blue light is not shown in its direction, it shall wait at the side of the canal to its starboard.

8. No vessel shall be operated under sail in the canal.

9. Every person who violates any provision of these Regulations, or who is in charge of a vessel that is operated in contravention of these Regulations, is guilty of an offense and is liable on summary conviction to a fine not exceeding five hundred dollars.

Burlington Canal Bridge Radiotelephone Station, call sign XL146 on frequencies 2182 kHz or 156.6 MHz safety and calling, and 2003 kHz or 156.8 MHz working and 156.7 MHz—alternate working, is operated by the Department of Public Works for communication with radio telephone equipped vessels passing through the Burlington Canal Bridge. Vessels approaching and desiring to pass through the bridge from the lake side shall obtain a clearance by radio-telephone at not less than 5 miles from the bridge. Vessels on the harbor side of the bridge shall obtain a clearance by radiotelephone before leaving their dock. In both cases, vessels could be governed by the bridge traffic lights as soon as they approach within visual distance.

Harbor Facilities: Proceeding around the harbor there are many facilities including: The Hamilton Harbour Commissioner's Pier 24, situated at the foot of Strathearne Avenue on the east side of the slip. The outer end of the Pier measures 1,060 feet slipside and 1,042 feet along the north face and contains a 200- by 800-foot transit shed and eight loading ramps which are operated by Canadian Steamship Lines. The inner section of the pier is 1,300 feet long. Both sections have railway service.

The Hamilton Harbour Commissioners' Pier 23, situated at the foot of Strathearne Avenue, was completed in 1960. The outer section is approx. 1,238 feet long by 226 feet wide and the inner section is 1,140 feet long by 136 feet wide. The depth available along both sections of the dock face is 27 feet. Canada Steamship Lines have relocated their Hamilton operation in a new Commission-owned terminal constructed in 1966–67 on the east side of this slip at the outer end of Pier 24. The 27-foot channel leading to this slip is marked with buoys on the north and south sides.

The Dominion Foundries & Steel, Limited, has Pier 21, 1,265 feet long, equipped with two traveling bridge unloaders. An approach channel 3,000 feet long, 26 feet deep, and decreasing in width from 480 feet to 200 feet, leads to a slip 200 feet wide, and 25 feet deep, extending the length of the wharf face which is approxi-

mately 860 feet long. There is a turning basin 24 feet deep and having a turning radius of 800 feet on the east side of the approach channel near its inner end.

Ottawa Street Slip, 200 feet wide, extends 2,400 feet inward from the northerly end of the Steel Co. of Canada dock which is situated on the westerly side. This dock, formerly owned by Hamilton By-Products Coke Ovens, Ltd., now comprises the site of a new steel rolling mill. On the east side of the inner end of the slip, Canadian Industries Limited has a wharf 800 feet long, equipped with sulphur unloader, railway siding and oil pipelines. Siltation has reduced the depth in the slip to 15 feet. The inner approach channel which extends 1,400 feet bayward from the slip, has a present least depth of 17 feet and the outer approach which extends a further 1,600 feet into the bay has a least depth of 18 feet.

On the west side of the approach channel, a portion of the bay has been diked and reclaimed by the Steel Co. of Canada Ltd. Filling has also been undertaken on the east side of the approach channel by Dominion Foundries and Steel, Limited.

The Steel Company has two wharves, Ore Wharf No. 3, 1,600 feet long consisting of three sunken vessels. There are no unloading facilities at this dock and it is used exclusively for self-unloaders. Ore wharf No. 2 Southwest of ore wharf No. 1 is completed for a length of 1,753 feet and is equipped with two travelling bridge unloaders; the channel 400 feet wide adjoining its face wall has a depth of 26 feet.

Construction Operations.—A major land reclamation project is in progress on the port of Hamilton waterfront, in the area eastsoutheastward of Pier 16. Queries concerning the availability of berths in the development area should be directed to the Harbour Master. (See latest edition of Canadian Hydrographic Chart 2067.)

The International Harvester Co., Ltd., has a wharf about 700 feet long, with storage shed. A channel 240 feet wide adjoining the wharf face and an approach channel had a controlling depth of 15 feet as shown by a survey in December 1941. The Twine Mill wharf, about 400 feet to the westward, is 700 feet long; the adjacent channel is 350 feet wide and 1,900 feet long, extending about 900 feet westerly from the west end of the wharf, and has a depth of 24 feet except for a strip 20 feet wide adjoining the wharf face with depth of 18 feet.

The Hamilton Harbour Commissioners' Pier 14, completed in 1959, is situated between Wentworth Street slip and the International Harvester Company Twine Mill wharf. The westerly face is 1,263 feet long, the northerly face 820 feet long, the easterly face 280 feet long. A depth of 27 feet is available over a width of 150 feet along the west face, 300 feet along the north face, and 50 feet along the east face.

The former Canada Steamship Lines Wharf is 600 feet long and 258 feet wide. The channels, 175 feet wide along the easterly face, 200 feet wide along the westerly face, have a depth of 22 feet. This is now a Commissioners-owned terminal to be reconstructed.

The Hamilton Harbor Commissioner's Pier 12 is 456 feet wide, measured along the harbor line face, and has a westerly face 1,301 feet long and an easterly face 1,262 feet long. The slips between this wharf and the former Canada Steamship Lines wharf to the east and the Hamilton Harbour Commissioners' Pier 11 to the west are 200 feet wide, and the dredged depth on the north and west sides is 22 feet. In April 1978, the slip between Pier 12 and the former Canada Steamship Lines wharf was being filled in.

The Hamilton Harbour Commissioner's Pier 11 is 1,128 feet long on the harbor line face, with a westerly face, 1,685 feet long and an easterly face 1,300 feet long. The easterly face, with railway siding, abuts on the Emerald Street slip, 200 feet wide, and the westerly face abuts on the Wellington Street slip, 200 feet wide. The depth in front of the outer face of the wharf and in the adjoining slips is 23 feet. For 800 feet along the west side, it has been dredged to 26 feet to accommodate tankers.

Wellington Street Terminal (Pier 10).—The Hamilton Harbour Commissioners' Wellington Street Terminal, situated on the westerly side of Wellington Street slip, consists of an old established structure and a newly constructed extension. The overall length of the easterly face of the wharf is 1,683 feet and the width, measured along the harbor headline, is 718 feet. The easterly face of the wharf is equipped with a railway siding and warehouses. The depths available in the berths adjacent to the wharf extension are 27 feet. The berth in Wellington Street slip, adjacent to the older 1,065 foot section of the wharf is 23 feet deep. Included in the new work is a breakwater arm extending 588 feet along the harbor headline from the northwest corner of the wharf extension. The wharf fronting H.M.C.S. "STAR" which adjoins the old Catharine Street Wharf at its inner limit, extends 880 feet easterly to Wellington Street Wharf, is 22 feet deep, excepting a strip about 20 feet wide which is 12 feet deep immediately fronting the H.M.C.S. "STAR" wharf.

Centennial Dock (Pier 8).—The Catharine Street wharf has been greatly enlarged and with the new section has been designated the "Centennial Dock" by the Hamilton Harbour Commissioners.

The new structure extends northerly from the older dock approximately 70 feet making the total length of the east face 504 feet, and then northwesterly along the harbour headline 1,686 feet. It returns 600 feet southerly. A slag berm starts at the end of this southerly extension and runs easterly 500 feet, thence 320 feet southeasterly, where it meets the shoreline east of the Harbour Police Basin. A new warehouse 180 feet wide by 600 feet long has been erected at the easterly end of the new dock. There is a least depth of 27 feet alongside the wharf extension and the original section.

A pipeline well has been constructed at the northwest corner of the dock extension where three cross country oil pipelines enter the harbour.

Posted on Pier No. 8 and readable from east through north to west are two signs floodlighted at night and reading as follows: "Danger—underwater Oil Pipelines—Anchorage Prohibited".

All areas adjacent to the slag berm have been dredged to 27 feet to within 60 feet of the berms.

James Street Wharf of the Harbour Commissioners, which is 435 feet long, has a channel 100 feet wide and 16 feet deep on its east side and a depth of 6 feet on its west side.

La Salle Park Wharf on the north side of Burlington Bay, 170 feet wide and 322 feet long, is the property of the Hamilton Parks Board and under its jurisdiction.

Canada Centre for Inland Waters.—Burlington Beach Wharf (Pier 29).—The Hamilton Harbour Commissioners' Burlington Beach Wharf, situated in Hamilton Harbour immediately north of Burlington Canal, was completed in 1961 and was acquired in 1967 by the Federal government as the site of the Canada Centre for Inland Waters. Seaway depth berthage is provided along the south face wall which is 1,018 feet in length and the westerly face 646 feet in length. The Federal Department of the Environment, commenced construction of a water pollution research centre for the Great Lakes on this wharf in 1967.

A detached breakwater constructed in 1969 and extending 1,700 feet 333° true, is marked with a light at each end. The breakwater is located 350 feet southwest of the westerly dock face of the Canada Centre and north of the Burlington Canal.

Desjardins Canal connects the extreme western end of Burlington Bay with **Dundas.** Five fixed bridges, about 34 feet high in the clear, cross the canal at its easterly end. The canal is now used only by small boats having minimum draft because of heavy silting. The depth of the canal was reported to be 4 feet in 1973, width 40 feet, and length 4 miles.

Caution.—Power boats are restricted west of the east entrance to the Desjardins Canal. Authority of Hamilton Harbour Commissioners.

Oakville Refinery Wharf.—The Shell Oil Company of Canada, Limited, during 1963 completed construction of a wharf on Lake Ontario adjacent to their new refinery approximately 1½ miles west of Bronte. The structure consists of a causeway 541 feet in length, an approach 1,131 feet in length with reinforced concrete superstructure and steel sheet pile cellular foundations, and a cellular type wharf approximately 463 feet in length. There is a least depth of 25 feet on both sides of the wharf. The structure is used solely for the shipment of liquid materials.

Intake Pipeline.—A water intake pipe, marked by a buoy at the outer end, extends about 1,500 feet into the lake, about 1¼ miles south-southwestward of Bronte Harbour, close northward of the Shell Oil Company pier structure.

Bronte, Ontario.—Bronte, formerly a village, now part of the town of Oakville, has a fishing boat harbor, located about 8 miles northeasterly, from Burlington entrance channel. The harbor, an artificial one, has been formed by dredging between two piers which confine the channel of Bronte Creek at its mouth. The north pier, which parallels the bank of the creek, is approximately 910 feet long, and the south pier, constructed to enclose a triangular section of the entrance channel, is about 700 feet long. Both piers are constructed of steel sheet piling with concrete copings. The inner harbor is 320 feet long with widths of 60 feet to 145 feet. It was dredged in 1973, to a depth of 5 feet. The outer harbour and approach channel is some 1,500 feet long with widths of 60 feet to 120 feet. In 1977, the controlling depth was 7 feet. The approach channel follows closely along the north breakwater and pier. Bronte light is exhibited 30 feet above high water from a white circular steel tower with red top near the outer end of the north pier.

Water Intake Pipeline.—A water supply line located 100 feet east of the North Pier at Bronte Harbor, extends 870 feet into Lake Ontario with a least depth of 9 feet over the intake. It is not marked.

Outfall Pipeline.—Situated 1½ miles northeast of Bronte is a sewer outfall pipeline which extends 850 feet into Lake Ontario with a least depth over the outlet of 7 feet. It is not marked.

Submarine Pipeline.—A submarine pipeline commences on the shoreline about 1,500 feet 241° from the light on the easterly end of the east pier and extends 1,900 feet 156½°. The outer end of the pipeline is marked with a privately maintained buoy.

Oakville, Ontario.—This town is at the mouth of Oakville Creek, about 3½ miles northeasterly from Bronte and about 18 miles southwest of Toronto. The harbor is formed by piers extending into the lake and by a dredged area in the mouth of the creek.

Improvement Works.—The west pier is 565 feet long. The east breakwater pier, located so as to form a triangular extension to the entrance channel, is about 700 feet long. The minimum width between the piers is about 100 feet. A channel with a depth of 12 feet leads to the Oakville Harbour entrance between the breakwaters. The turning basin inside the breakwater had depths of 6 feet in 1976, and the channel leading into the creek past the second high-level bridge, had depths of from 7 to 14 feet.

Aids to Navigation.—The dredged channel into the harbor is marked by unlighted buoys located about 600 feet southeastward of the entrance.

A light is shown on the south end of the east pier.

Intake and Outfall Pipelines.—Situated 1½ miles northeast of Oakville is the Ford Motor Company's 36-inch diameter water intake pipeline, which extends 2,600 feet into Lake Ontario with a least depth over the crib of 20 feet, and marked with an unlighted buoy.

A 60-inch diameter sewer outfall pipeline extends 600 feet into Lake Ontario with a least depth over the outlet of 3 feet in the same area. The outfall is not marked.

St. Lawrence Cement Co. Wharf.—A causeway 100 feet wide and 1,200 feet long, leads to a wharf 1,500 feet in length, varying in width from 67 feet at the inner end and 200 feet at the outer end, located approximately 5,100 feet southwest of the oil dock at Clarkson. On the western side of the outer end are two conspicuous loading towers, each about 80 feet high. The wharf can berth vessels up to a 27-foot draft.

Outfall Pipeline.—A Township of Toronto sewer outfall pipeline, located ⅛ mile east of the St. Lawrence Cement dock, extends 1,750 feet 135½° into Lake Ontario; least depth over outlet is 23 feet. It is not marked.

Water Supply Pipeline.—The Gulf Oil Company has in-

stalled a 72-inch diameter water intake pipeline at a point 385 feet west of their dock at Clarkson. The pipeline extends 975 feet into Lake Ontario and the depth over the intake is 13 feet. It is marked with an unlighted buoy.

Clarkson Harbor, Ontario.—This harbor is the location of a dock constructed by the Gulf Oil Co., Ltd., on the shore of the lake 4⅝ miles northeast of Oakville.

Improvement Works.—A concrete approach extends from the shore 1,140 feet 132° into the lake, connecting with a concrete dock extending thence 738 feet 158°. In 1968 there was a least depth of 23 feet on the east side of the outer dock, and berths with least depths of 24 and 22 feet on the west side. Bollards are provided for mooring vessels on either side of the dock. The lake bottom in the vicinity is shelving shale rock and the use of anchors is impracticable. A 259-foot concrete smokestack marked at night with fixed red aircraft warning lights forms a prominent landmark.

Aids to Navigation.—Working lights are installed along the entire length of the structure. A range of lights marks the alignment of the outer dock, the front light on the lakeward end, and the rear light 650 feet 338° from the front light. Also, a light is shown on the lakeward end of the dock, and an air fog whistle sounds as required.

Refinery Slip.—At the Regent Refining (Canada) Ltd.'s oil refinery (on the site of the old Port Credit Brick Co.'s plant), about 2,000 feet south of the river mouth, there is a dredge slip and an entrance channel from the lake, protected by a pier extending about 400 feet southeasterly from the shore on its northerly side, and having a depth of about 12 feet.

Three cribs, situated about 2,100 feet southeasterly from the outer end of the pier, form a marine terminal with a berthing of 500 feet, with a depth of 21 feet in the berth alongside. An oil pipeline extends from the pier to the middle crib. Privately maintained lights are exhibited from the cribs. The pipeline is marked by three white floats.

Port Credit, Ontario.—This harbor is at the mouth of the Credit River, about 8½ miles northeasterly from Oakville and about 10 miles southwest of Toronto.

Improvement Works.—The harbor is protected by two stone breakwaters and sunken ship breakwater extension which leave an opening about 60 feet wide to the southwest of the approach channel.

The east breakwater is located 400 feet east of the east facewall and extends from the shore lakeward some 2,300 feet parallel to the east facewall. The extreme south end has a 50-foot leg and an additional 570-foot length of breakwater provided by a sunken lake freighter extending westerly.

The west breakwater commences at the west limit of the wharf and extends south some 400 feet and thence southeast approximately 1,050 feet to a point opposite the ship extension to the east breakwater, thus leaving the 60-foot opening.

The entrance channel to the small boat anchorage at the mouth of the Credit River is located west of the harbor and follows the curved training wall which forms the extreme west limit of the wharf. The channel is approximately 1,300 feet long by 100 feet wide and lies adjacent to the steel sheet pile wall. The depth of the channel is 7 feet.

Aids to Navigation.—Lights at Port Credit are as follows: On the west breakwater, a light is shown 30 feet above high water, from a white circular tower; on the outer end of the east breakwater, a light is shown 30 feet above high water, from a white circular tower; on the bow deck of the ship extension to the east breakwater, a light is shown some 25 feet above high water, from a white circular tower; on the southwest end of the training wall, a light is shown 30 feet above high water, from a white circular tower.

Harbor Facilities.—Existing harbor facilities at Port Credit consist of small boat anchorages which are comprised of floating concrete wharfs secured to the Elizabeth Street Slip Facewall on the east and south.

The east wall is equipped with 8 (inoperative) electrically operated loading ramps which service a warehouse 1,000 feet long by 150 feet wide.

The Elizabeth Street Slip is 226 feet wide by 1,000 feet long and the approach to this slip is by a channel measuring some 1,300 feet long by 300 feet wide.

Water Supply Pipelines.—A black flashing white lighted spar marks the southerly end of the St. Lawrence Starch Company's water intake crib situated approximately 1,000 feet easterly of the entrance to Port Credit Harbor. The least depth over the crib is 22 feet.

A Town of Mississauga water supply pipeline, situated 1.4 miles east of Port Credit, extends 2,500 feet into Lake Ontario with a least depth over the intake of 16 feet.

Lakeview Station.—The Lakeview Generating Station is located about 2 miles northeasterly from Port Credit and about 7½ miles southwest of Toronto. Two structures, with a dredged channel between, extend into the lake perpendicular to the shoreline. The northerly structure is approximately 1,000 feet long and the southerly, a coal dock, is approximately 2,000 feet long. There is a depth of 27 feet in the approach channel and alongside coal wharf.

Aids to Navigation (Private).—Lakeview Light is located on the end of the coal dock. The entrance to the dredged channel is marked by Lakeview North Lighted Buoy and Lakeview South Lighted Buoy. Unlighted buoys on the north side and on the south side, mark the approximate mid-point of the channel proper.

Outfall Pipeline.—A Town of Mississauga 60-inch sewer outfall pipeline, situated ½ mile west of the mouth of Etobicoke Creek, extends 1,800 feet into Lake Ontario with a least depth over the outlet of 12 feet. It is not marked.

Construction Operations.—Beginning at a point approximately 1,500 feet west of the mouth of the Humber River, fill is being placed by the Toronto Harbour Commissioners to form a protective breakwater for a small boat harbour and marine park.

This filling and construction extends westward for approximately 3,500 feet and is about 2,500 feet offshore. Temporary caution lights have been placed on the outer

ends of the fill and are repositioned as the work progresses.

Outfall Pipeline.—A submerged sewer outfall extends 2,600 feet 140° into Humber Bay approximately from a point on the shore line 500 feet southwest of the mouth of the Humber River. The outer end of the sewer outfall is marked with a privately maintained lighted buoy.

Western Breakwater.—From the Humber River, a breakwater composed of timber crib substructure and concrete superstructure parallels the shore at an average distance of 350 feet and extends easterly nearly 4 miles to the west end of the north wall of the Western Channel entrance to Toronto Harbour. The western end of this breakwater is marked by a flashing red light.

Low-powered flashing red and green lights mark five openings in the breakwater west of the western channel entrance. One set of lights with the green on the west side and the red on the east side is at the first opening about 11,500 feet west of the western channel. The other four pairs are similar at the openings located 9,700 feet, 6,700 feet, 1,800 feet, and 200 feet west of the western channel entrance. These lights are for guidance of small craft and should not be confused with other navigation lights.

Ontario Place.—Beginning at a point approximately 5,000 feet west of the west end of the Western Channel Entrance to the Inner Harbour, the south-east corner of a protective breakwater about 1,500 feet in length is marked by a flashing yellow light, 40 feet above high water.

This breakwater, composed of the hulls of three lake-type vessels, protects pavillions, buildings and a small boat marina in Lake Ontario in front of the Canadian National Exhibition Grounds. Two white clearance lights are positioned along this breakwater at 500 feet and 1,000 feet west of the flashing yellow light.

Toronto Harbour, Ontario.—This harbor is on the northwest shore of Lake Ontario, about 35 miles from the west end of the lake. The harbor, formed by a low island (known as Toronto Island) on the south and west sides and by docks and wharves on the north and east sides, is about 2 miles long east and west and about one mile wide north and south. Copies of the By-laws for the control of the harbour at Toronto, may be obtained on application to the Secretary, Toronto Harbour Commissioners, Toronto, Ontario.

Vessels entering, leaving or changing berth within Toronto Harbor will proceed with utmost caution, having due regard for other vessels moving in the harbor.

The Toronto Harbour Commissioners operate a Harbour Communications Centre for emergency, safety and operational requirements. Ships entering Toronto Harbour should contact the Toronto Harbour Master's Office for information by radio-telephone, Toronto call sign XJF-495, on frequency 156.8 MHz—Safety and Calling, and 156.6 MHz—Working, and 156.7 MHz—Alternate Working.

Radio Facility.—A marine radio station at Toronto (call sign VBG) is operated continuously during the navigation season. Extended range ship-shore VHF transmitting and receiving facilities at Fonthill, Ont., and Cobourg, Ont., are remotely controlled from this station.

There are two channel entrances from the lake to the harbor, one at the northwesterly corner and one at the southeasterly corner.

Western Channel Entrance.—This entrance has a north concrete wall 2,235 feet long and a south concrete wall 2,535 feet long parallel and 400 feet apart. The channel has been dredged to a depth of 27 feet in rock for a middle width of 360 feet between the walls and to a depth of 29 feet in the lake approach for a distance of approximately 4,200 feet, where natural deep water is reached. The dredged area flares out on the south side to a maximum width of approximately 970 feet at the outer end. The channel is well marked on its north edge and on the south edge by lighted and unlighted buoys. A cellular concrete wall extends approximately 848 feet lakeward from the west end of the south wall at an angle of 007°30′ south of the bearing of the channel. This structure is part of the retaining wall for the Toronto Island Airport runway.

The approach is marked by two range lights on the south wall. The front light, visible from all directions lakeward, is near the west end of the wall; an electric fog horn at this station, bearing 233°, sounds as required or in case of its failure, a standby hand foghorn is sounded. The rear light is near the east end of the south wall, 2,350 feet 053°30′ from the front light. A lighted bell buoy (No. 15) is located on the prolonged center line of the dredged channel and 200 feet north of the range alinement distant approximately 5,800 feet 236° from the front light, and marks the turning point in the lake approach to the channel.

Ferry Across Western Channel.—A ferry, carrying passengers and vehicles, operates at right angles across this entrance to and from Toronto Island Airport. The ferry slips are located about 550 feet from the east end of the concrete walls.

Inner Harbor Channel.—The Western entrance channel dredging flares easterly into the harbor for a distance of approximately 1,000 feet where it connects with an inner navigation channel 500 feet wide, located parallel to and south of the harbor headwall between limits 300 feet and 800 feet from the wall. This channel extends easterly to a point approximately 1,000 feet west of the York St. slip and then flares out, with the northerly limit being the extension westerly of a line of the headwall along the north side of the harbour between the York St. slip and the easterly end of the harbour, such headwall being also the northerly limit of the channel in this location, all to a depth of 27 feet. Harbor areas south of the main dredged inner harbor channel are designated in various categories of approach to anchorage grounds or anchorage areas.

The entire length of the inner harbor along the north and east sides is extensively developed with a series of wharves and slips. The south and west sides are formed by a series of small islands developed for parks and recreational areas.

Keating Channel.—This channel is the outlet of the Don

River and extends easterly for a distance of 3,700 feet from the northeasterly angle of the harbor and is 120 feet wide. It has a general depth of about 15 feet, but is subject to deposit resulting from freshets in the Don River and requires seasonal dredging.

A bascule bridge with 80-foot span crosses the channel at the line of Cherry Street, about 1,500 feet from the west end of the channel.

Ship Channel and Turning Basin.—From the east side of the harbor near the southeasterly corner, a ship channel 400 feet wide and 6,800 feet long runs easterly through the industrial district, terminating at its eastern end in a turning basin 1,100 feet square. The Leslie Street Slip extends 1,350 feet east from the east face of the turning basin. The south wall of the slip is in line with the south wall of the basin. The slip is 400 feet wide at the entrance, narrowing to 200 feet at the end. The ship channel, and turning basin are dredged to 27 feet, and the Leslie Street slip is dredged to 24 feet.

The entrance to the ship channel is marked by a low powered flashing green light on the northerly side and a low-powered flashing red light on the southerly side.

A bascule bridge with 120-foot span crosses the ship channel at the line of Cherry Street, about 1,500 feet from the west end of the channel. The bridge is marked underneath by a white light on each side of the navigable channel (120 feet wide), and also by a light showing red along the channel when the bridge is closed and green when open. The vessel signal for opening the bridge is one long, one short, and one long blast of the whistle; the bridge whistle sounds the same signal in return before opening and two short blasts before closing, and if not ready to open three short blasts are sounded. Vessels should not attempt passage until the span is fully opened.

On the west side of the bridge a submerged 12-inch water main crosses the channel at a depth of about 33 feet. An 8-inch gas main at a depth of 36 feet is also located on the west side of the bridge. On the east side a telephone submarine cable crosses at a depth of about 34 feet, and a 10-inch oil pipeline at a depth of about 34 feet. Another oil pipeline crosses 3,000 feet east of the bascule bridge at a depth of about 34 feet. Vessels should navigate with caution and not drag anchor at these points.

Main Harbour Channel Entrance (formerly Eastern).—This entrance consists of a buoyed approach channel approximately 1,000 feet wide swept to a depth of 30 feet from the southwest end of the Outer Harbour East Headland for a distance of approximately 6,500 feet in a north northeasterly direction. This approach channel enters a narrower buoyed channel approximately 700 feet wide swept to a depth of 30 feet for approximately 2,000 feet in a north northwesterly direction. This narrower channel is confined by a concrete dockwall on the west side and a steel sheet pile and concrete dockwall for a portion of the east side.

The outer end of the approach channel is marked by a flashing red radar reflector buoy (43°36'38.5'' N, 79°20'48'' W) and a flashing green radar reflector buoy (43°36'51.4'' N, 79°21'00.9'' W). The centreline of the approach channel is marked by a 002°30' lighted range.

Gibraltar Point.—Gibraltar Point is the southwesterly point of Toronto Island. A radiobeacon on the point operates continuously on 290 kHz. A lighted buoy south of the point marks the extent of the shoal water off the point.

Five radio transmitting masts spaced at 400-foot intervals are situated on a line extending south-southeastward from Gibraltar Point. Red aircraft obstruction lights are exhibited from the masts. There is a pier situated 8½ cables northeastward of the above towers. Two buoys, marking the seaward end of water intake pipes, are about 2,000 feet south of Gibraltar Point.

Outer Harbour East Headland.—A breakwater, approximately three miles in length extending southwesterly from the mainland from Coatsworth Cut to and beyond the Eastern Channel Entrance, has been constructed by the Toronto Harbour Commissioners.

The outer end of the headland exhibits a flashing red light 52 feet above the water. A radar transponder beacon (Racon) is at the light. (See Light List for details.) In addition, street lighting extends along the roadway, located on the headland, lights being spaced approximately 300 feet apart and five flashing red lights are located along the lake-side edge of the headland. Truck dumping and hydraulic dredged material continues to be placed on the outer end and the inside of the headland.

Construction Operations.—On the east side of Coatsworth Cut, fill is being placed by the Toronto Harbour Commissioners to form protective breakwaters, extending south into Lake Ontario, for a small boat harbour and marine park. Temporary caution lights have been placed on the outer ends of the fill and are repositioned as the work progresses.

Also, approximately five miles measured north-easterly along the shoreline from Coatsworth Cut, a similar small boat harbour is being constructed in Lake Ontario at the foot of Scarborough Bluffs. Temporary caution lights have also been placed.

Frenchman Bay, Ont., is 18 miles northeast of Toronto. There is a depth of 5 to 12 feet in the harbor, which is reached through a channel cut through a neck of land. Wooden piers 650 feet long and 100 feet apart on either side of the channel are in ruins and only the substructures remain. In 1959, a channel 1,250 feet long and 30 feet wide, located at the entrance between the piers, was dredged to a depth of 5 feet. Soundings completed in 1972 indicated a least depth of 4 feet in the entrance to Frenchman Bay. Several marinas and a yacht club are situated in Frenchman Bay. A tri-colored directional range light showing equal interval green, white, and red sectors, is located on the west end of the east bar to mark the approach to the bay. The white light is visible between 000½° and 003½° and indicates the preferred channel, with red showing to the east and green to the west. The entrance to the bay is marked with a standard buoy while privately maintained buoys lead into the bay.

Pickering Generating Station.—The buildings of the Pickering Generating Station (Nuclear) east of Frenchman Bay at Moore Point are good landmarks. A dome, 225 feet high with red lights, is located close south of the

power station. A microwave tower, 315 feet high, marked with red lights, is situated close north of the power station.

Water Supply Intake.—A submarine pipeline extends lakeward 1,960 feet 163° from a point on shore about 4½ miles southwest of the entrance to Port Whitby. The outer end of the pipeline is marked by a buoy in approximately 30 feet of water.

Whitby Harbour, Ont.—Whitby Harbour lies about 26 miles northeastward of Toronto. The town of Whitby is located about 1½ miles north of the harbour on Lake Ontario.

Improvement Works.—The harbor is formed by a long breakwater closing the westerly part of the natural opening from the lake, and by two piers extending into the lake at the east side, 300 feet apart.

The dredged approach channel extends 1,760 feet lakeward from the south end of the east pier with an outer width of 550 feet narrowing to 230 feet between the piers. The entrance channel and inner harbor have an average width of 317 feet extending into the harbor for about 1,820 feet.

The west pier has an overall length of 688 feet of which the relocated section is 268 feet long and the east pier has an overall length of 647 feet. West protection breakwater, completed in 1960, is a 280-foot rubble mound breakwater extending from the south end of the west pier. This structure has a width at water level of 58 feet and a base width of 118 feet along the west side of the dredged channel.

In September 1977, it was reported that the approach channel was being maintained to 18 feet and the entrance channel and inner harbor to 14 feet.

Aids to Navigation.—The approach to the entrance channel from the lake, is marked with a set of range lights. The front range light is located at the outer end of the east pier. The rear range light is located 658 feet 354° from the front light. The dredged channel into the harbor, including the south limit, is marked by unlighted buoys.

Submerged pipelines.—Two water intake pipelines lead into the lake close eastward of the Whitby Harbour entrance. Buoys mark the seaward ends of the pipelines.

Oshawa, Ont.—The city of Oshawa is situated on Oshawa Creek, and extends about 4 miles inland from the lake, about 31 miles northeast of Toronto, on the Canadian National and Canadian Pacific Railways. Effective April 7, 1961, under the Oshawa Harbour Commissioners Act, the harbour is under the administration and control of the Oshawa Harbour Commissioners, 36½ King Street, East, Oshawa, Ontario. Copies of the By-laws for the control of the harbour at Oshawa, may be obtained on application to the Secretary, Oshawa Harbour Commission, Oshawa.

Improvement Works.—The west pier or landing wharf of Oshawa Harbour extends 1,082 feet into the lake in a southeasterly direction. A protected entrance is formed by a pilework and rubble-mound breakwater 900 feet long, parallel to and 400 feet easterly from the wharf.

Soundings completed in July 1978, indicated a controlling depth of 27 feet in the entrance channel, and it was reported that controlling depths of 18 and 17 feet were being maintained in the northeast and southwest parts of the harbor basin, respectively.

The inner harbour is bounded on the south and west by harbour walls having lengths of 512 feet and 1,126 feet respectively and is partially bounded on the east by a 500-foot pile-supported wharf. This wharf was extended in 1974 an additional 200 feet using steel sheet piling construction. Shoaling occurs annually at the entrance and in the harbour, necessitating periodic dredging to maintain adequate depths.

The Oshawa Fire Dept. maintains a rescue boat on a 24 hour basis.

Aids to Navigation.—On the west pier, there is a range of lights; the front light is at the outer end of the pier and the rear light is 1,050 feet 327°22′ from the front light. A fog whistle signal, sounding as required, is located on the front range tower. A marker radiobeacon on 314 kHz is operated during the navigation season. Unlighted buoys mark the limits of the dredged channel.

Submerged Pipeline.—A water intake pipeline commences from a point on shore about 4,500 feet 250° from Oshawa Harbor and extends 3,400 feet 168°. The outer end is marked by a privately maintained buoy in about 30 feet of water.

A prominent stack and water tower of General Motors of Canada is located 2¼ miles northwest of Oshawa Harbor.

Port Darlington, Ont.—This harbor is about 39 miles northeast of Toronto, on the Canadian National and Canadian Pacific Railways. The town of Bowmanville is directly inland from the port. The harbor consists of a small bay and a channel at the mouth of a small creek.

Improvement Works.—The entrance channel was dredged to a depth of 4 feet in 1950. The channel was formerly protected by an east pier 800 feet long and a west pier 1,180 feet long, parallel and 160 feet apart. These structures have not been maintained and there is not much left of the east pier; however, the west pier has been reconstructed in rubble.

In 1972, a depth of 2 feet was reported in the entrance channel.

A marina known as Port Darlington Boat Basin, is situated about half a mile inland. Facilities include a hoist, repairs, pump-out service and gasoline.

Aids to Navigation.—A light, 36 feet above high water, is mounted on a white circular steel tower with black top on the outer end of the west pier. A buoy is moored in 10 feet depth south of the outer end of the submerged crib on the east side of the channel.

The floodlighted buildings and chimney of St. Marys Cement plant located one half mile west of Port Darlington are good landmarks.

Newcastle, Ontario.—This harbour is 55 miles east of Toronto. A dredged channel from Lake Ontario has a grade depth of 7 feet.

Improvement Works.—New steel pile entrance breakwaters approximately 200 feet long extending out from shore were completed in 1974, to mark the entrance to Graham Creek leading into a new privately owned com-

mercial marina located to the north and west of the harbour entrance. The channel width between the breakwaters at the entrance is 70 feet.

There are no navigational aids.

Port Hope, Ont.—This harbor is a uranium extraction port, no longer used as a coal and merchandise port, on the north shore of the lake and on the Canadian National and Canadian Pacific Railways, 63 miles northeast of Toronto.

Improvement Works.—There is an outer harbor, an inner basin and an east arm into which the **Ganaraska River** empties.

Port Hope Harbor is no longer maintained by dredging. In June 1978, the controlling depth through the entrance was 2 feet; a depth of 2 feet could be carried from the outer harbor into the east arm for about 0.2 mile with shoaling to 1 foot above this point; the channel leading to the inner basin had depths of 8 to 11 feet, with 3 to 7 feet available in the inner basin. The harbor affords excellent shelter for small craft.

Aids to Navigation.—Port Hope Light, shown 28 feet above the water from a white circular tower, marks the outer end of the east breakwater. A range of lights leads into the entrance between the breakwaters. The front range light is shown 32 feet above the water from a white circular tower with a black top on the west breakwater. The rear light is 41 feet above the water on a white steel skeleton tower 467 feet 320°21′ from the front light.

Peter Rock lies about 4,000 feet offshore about 3 miles east of Port Hope. It is marked by a circular steel tower with a red top, from which is shown a light. There is a landing for small boats only. The narrow channel between the main shore and the light is not marked or used.

Cobourg, Ontario.—This Public Harbor is on the north shore of Lake Ontario, about 68 miles northeasterly of Toronto; it is a station of the Canadian National and Canadian Pacific Railways.

Improvement Works.—The harbor is formed by three piers. The east pier is about 2,000 feet long, running southerly from the shore. The center pier is about 800 feet long, with its inner and outer ends respectively 870 and 275 feet west of the east pier. The harbor front between these two piers, 870 feet long, consists of timber cribs with concrete superstructure, and is known as the Esplanade wharf. Projecting from the east pier about 380 feet south of the Esplanade wharf, a short checkwater pier extends 200 feet from the east pier westerly toward the center pier and protects the inner harbor.

The west pier or breakwater, located with its shore end about 1,200 feet west of the east pier, is 2,230 feet long, running first southerly from the shore and then on an angle toward the east breakwater, inclosing the outer harbor and reducing the width of opening between the outer ends of the east and west piers to 325 feet.

The approach to the harbour was dredged in 1965 to a grade depth of 19 feet to a point 420 feet north of the south (outer) end of the east pier. In 1977, the harbor depths were being maintained as follows: 17 feet in the harbor approach to a point 420 feet north of the south end of the east pier; thence 15 feet from this point, providing an approach to the east and center piers. The Canadian National Railway ferry slip on the east side of the center pier was being removed in 1966. A bar forms almost annually at the harbour entrance and shoaling also occurs within the harbour, necessitating periodic dredging to maintain adequate depths.

Aids to Navigation.—A range of lights 85 feet west of the east pierhead and shown from skeleton towers with triangular daymarks attached, leads into the harbor through the middle of the channel dredged through the bar off the pierheads. The front light is on the east pier. The rear light is on ground east of the east pier, 376 feet 007°30′ from the front light.

The outer end of the east pier is marked by a light, and a marker radiobeacon on 288 kHz is operated during the navigation season. A fog horn is sounded as required. A light is located on the west breakwater pier, 20 feet from its outer end.

Caution Area.—Cobourg Small Arms Range.—A Canadian Land Forces Exercise area is located between Cobourg and Lucas Point, Ont., and extends 8,000 feet lakeward from 43°57′45″ N., 78°07′13″ W., through an arc of 020° from 150° to 170°. This area is only in use intermittently and the period of use will be announced by local Ministry of Transport "Marine Radio Broadcasts" and may also be advertised in local newspapers.

Presqu'ile Bay, Ont.—Presqu'ile Bay is about 22 miles east of Cobourg. A dredged channel through this bay to the Murray Canal entrance, has a least depth of 6 to 7 feet.

Presqu'ile Point Light is on the east point of the peninsula at the entrance to the bay. Coming around the north side of the peninsula, Salt Reef Light, shown 34 feet above the water, is located just east of the reef on the south side of the vessel course. The light is mounted on a white circular tower with a red top on a steel circular crib.

At the westerly side of the bay are the Brighton range lights. Light No. 1 and Light No. 2, in alinement 295°05′, mark the dredged and buoyed channel leading in from Presqu'ile Point; when within the bay the course bends to the northeast, heading on Light No. 3, which should be left about 100 feet on the port hand in passing.

Caution.—It should be noted that the buoys in Presqu'ile Bay are placed as in continuation of the channel extending from Kingston through Bay of Quinte and Murray Canal to the open lake outside of Presqu'ile Point, with red buoys to starboard and black buoys to port when passing through, westward bound.

Murray Canal connects Presqu'ile Bay and the Bay of Quinte. It is 5.15 miles long from pierhead to pierhead, or about 7½ miles including the cuts through shoals beyond the pierheads, and is without locks. It is 80 feet wide at the bottom, 124 feet at the water surface, and had 9½ feet depth in 1975. Channels 200 feet wide have been dredged from deep water in the Presqu'ile Bay and Bay of Quinte to the piers which define and protect the ends of the canal. Upon the north piers at either end of the canal, there are lights, one near the end of the pier at the west entrance, and one similarly placed at the east entrance.

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Boats are restricted to 6 miles an hour in passing through the canal. No tolls are collected. There are 3 swing bridges crossing it; on the center of the swings are lights, green when the bridges are open, red when closed. Each bridge is passed to the south of the swing.

Bay of Quinte, Ont.—This is a long, sinuous and comparatively narrow body of water lying between Prince Edward County and **Amherst Island** on the south and the Canadian mainland to the north. Its total length is about 75 miles. The Murray Canal separates Prince Edward County from the mainland, forming an island. At its eastern end, the bay communicates with Lake Ontario by channels lying to the west and east of Amherst Island, the latter leading toward Kingston and the St. Lawrence River. Several rivers flow into the bay from the north.

The Bay of Quinte is buoyed with respect to entrance from the east at Kingston, with red buoys to starboard and black buoys to port when passing through, westward bound.

Entering the bay from the Murray Canal and passing eastward from the east end of the Murray Canal, the controlling depth to Belleville is about 12 feet. The channel is quite irregular and is marked with buoys. The first wharves are at Trenton, on the north shore.

Trenton, Ont.—This town is at the mouth of the Trent River, at the west end of the Bay of Quinte, on the Canadian National and Canadian Pacific Railways.

Improvement Works.—The Government wharf on the west side at the river mouth provides mooring facilities 1,350 feet long with depths ranging from 8 feet to 12 feet. The wharf fronts a park and contains a landing slip for small craft in the east-west face.

The channel in the eastern approach to Trenton, dredged by the Canadian Government, has a depth of 8 feet and a width of 150 feet from a point southeastward of Baker Island to Trenton. The edges of the channel are marked by lighted and unlighted buoys.

Submarine cables and pipelines cross the **Trent River** in the vicinity of the three bridges near the river mouth.

Trent-Severn Waterway (Canal).—This term is applied to a series of navigable rivers and lakes connected by some short canals, forming a continuous system about 240 miles long from Trenton on the Bay of Quinte, Lake Ontario, to **Port Severn** on Georgian Bay, Lake Huron. Limiting draft of the system varies as follows: 8 feet for 90 miles from Lake Ontario to Peterborough; 6 feet for an additional 143 miles between Peterborough and Big Chute. At **Big Chute** the draft is restricted to 6 feet by the capacity of the marine railways with 6 feet for the remaining 8 miles to Georgian Bay. Vessels drawing more than 6 feet must give the Superintendent, Trent Canal, Peterborough, 12 hours advance notice prior to entering the Lake Ontario to Peterborough reach.

Caution.—The limiting drafts given above are the depths to which the various reaches of the waterway are maintained. Mariners are to use their own judgement on whether these channel depths are sufficient for the draft of their boat.

Normal overhead clearance is 22 feet with a least recorded clearance of 15 feet. Of the 240-mile route, only 33¼ miles is artificial canal prism. The total rise from Lake Ontario to the summit level, Balsam Lake, is 598 feet, which is overcome by 33 locks. From Balsam Lake to Georgian Bay the fall is 260 feet, overcome by 9 locks and a marine railway. There is also a branch about 35 miles long in Scugog River and Lake Scugog, with 1 lock having a lift of 7 feet.

Canal Regulations.—Canal regulations and other canal-related information may be obtained from the Superintendent, Parks Canada, Ashburnham Drive, P.O. Box 567, Peterborough, Ontario K9J 6Z6. Copies of canal regulations are also available by mail from Printing and Publishing, Supply and Services Canada, Hull, Quebec, K1A 0S9. Mariners are required to have a copy of the regulations on board at all times. A maximum speed limit of 6 m.p.h. is enforced in all sections of the canal less than 150 feet wide.

From Trenton the route follows the Trent River to Rice Lake, passes through that lake and then follows the Ontonabee River past Peterborough to Lakefield, where it enters the Kawartha chain of lakes. Thence, it passes in succession through Katchiwano, Clear, Stony, Lovesick, Deer Bay, Buckhorn, Chemung, Pigeon, Sturgeon, and Cameron Lakes to Balsam Lake, the summit level, about 160 miles from Trenton. From Balsam Lake an artificial rock cut connects with the raised waters of Grass River and Mitchell Lake. Another rock cut carries navigation into the raised waters of Canal Lake and Talbot River. The Talbot River is canalized for 8 miles, from which point a canal carries navigation for 3½ miles to Lake Simcoe. Passing through Lakes Simcoe and Couchiching, the route then follows the **Severn River**, including Sparrow Lake, to Gloucester Pool and Little Lake, terminating at Port Severn, where a small lock gives outlet into Georgian Bay.

The Scugog branch embraces 8 miles of navigation in Scugog River from the south end of Sturgeon Lake (about 148 miles from Trenton) to Lindsay, where a dam and lock of 7 feet lift give navigation through an additional 8 miles of the river to Lake Scugog and for about 19 miles through the lake to Port Perry.

Water supply to maintain the summit level in the Kawartha chain of lakes, and stream flow in the Otonabee and Trent Rivers for power development, is obtained from a reservoir system embracing 64 lakes to the north of the Kawartha chain.

As all locks from Lake Ontario to Sparrow Lake are 33 feet wide, the beam of vessels navigating this section may not exceed 32 feet 6 inches. The maximum length, however, depends on the vessel's build. Square-built scows are limited to a length of 110 feet but vessels of standard build may be longer. They may be as long as 127 feet if the beam does not exceed 21 feet. Vessels 35 feet longer than these lengths may be accommodated up to the lower entrance to lock 19.

There are a number of branches diverging from the main channel through the lake portion of the canal, but the draft on these is variable. The most important branch is the 35-mile Scugog branch described above. This branch has 4 feet draft up to Lindsay and 4 feet above

that point at normal stages of the river. Normal overhead clearance is limited to 10 feet by the arch bridge south of Lindsay with a least recorded clearance of 8½ feet.

The route is well provided with public-service wharves, lighthouses, and buoys. Numerous bridges cross the waterway, either of swing type or high-level fixed spans with headroom of 22 feet.

Search and Rescue.—A Rescue Coordination Center (RCC) is at the Canadian Forces base at Trenton, Ontario; telephone 392-2811, extension 3870. The Canadian Coast Guard maintains a continuous watch at this center. The RCC is the headquarters of a coordinated network of agencies trained to search for and aid vessels in distress.

All distress situations and requests for assistance in the Trent-Severn Waterway area should be directed to the RCC at Trenton via the nearest Canadian Coast Guard radio station, by telephone or any other available means.

Aircraft Training Float Established.—An aircraft training practice float has been permanently established in the bay northeast of Baker Island and southeast of the Trenton Aerodrome. A light in 44°06′18″ N., 77°31′12″ W., "Mooring Raft", marks the float and will be in operation from 1 May to 31 October of each year.

Proceeding Eastward from Trenton, a channel dredged to 13 feet depth, bearing northeast, passes about 50 feet to southward of **Narrows Shoal** light; thence on through the draw of the Bay of Quinte swing bridge at Belleville.

Bridge.—The Bay of Quinte bridge (Bay bridge) has channels of 73 feet and 70 feet width on the north and south sides, respectively, of the draw span. The vertical clearance of this bridge is 7½ feet in the closed position. The horizontal clearance is 81 feet. A red light shows at each end of the draw span when the bridge is closed. When the draw is open two green lights flanked by two white lights will be seen. Vessels must pass between a green and a white light.

Period of operation.—15 May to 1 November (approximately):

a. Pleasure craft. 7 a.m. to 10 p.m. (on the hour).

b. Commercial craft. 24-hour operation daily.

Belleville, Ont.—This town is on the north shore of the bay, 11 miles east of its western extremity, at the mouth of the **Moira River**, and on the Canadian National and Canadian Pacific Railways. Copies of the By-laws for the control of the harbour at Belleville, may be obtained on application to the Secretary-Treasurer, Belleville Harbour Commissioners, Belleville, Ontario.

Improvement Works.—An entrance channel, 150 feet wide and 13 feet deep, was dredged in 1934 from deep water to the Harbour Commission wharf, the inner 600 feet being gradually widened to a maximum of about 600 feet. The area west of the Harbour Commission wharf, from Schuster's Dock south for 700 feet and extending westerly about 400 feet, was dredged to 13 feet in 1951–53. The area along the west face of Schuster's Dock northerly for a distance of 750 feet from the southwest corner of the dock and for an average width of about 200 feet was dredged to 9.2 feet in 1951–53. An area 400 feet by 400 feet being within the L of the Harbour Commission wharves had a depth of 10 feet in 1964. A channel, 100 feet wide and 13 feet deep, was dredged in 1944 from the above-mentioned basin northeasterly along the Harbour Commission's marginal wharf and extending about 100 feet beyond its easterly corner.

Aids to Navigation.—Belleville Light is on the roof of the Harbour Commission warehouse. A lighted buoy is located 1,350 feet 143½° from the Belleville wharf light. A series of unlighted buoys mark the channel, generally, into the wharves and indicate more than 10 feet of water.

Harbor Facilities.—The Harbour Commission wharves comprise a marginal wharf, 620 feet in length, adjoining an L-shaped wharf, with approach measuring 30 feet by 560 feet and the headblock, 75 feet by 200 feet. A warehouse located on the headblock of the Harbour Commission wharf measures 45 feet by 154 feet. Between the Harbour Commission wharves and the mouth of the Moira River to the west, lies Victoria Park, an island now joined to the mainland by a causeway. The Government wharf located in a sheltered bay on the easterly side of Victoria Park is of timber crib construction, L-shaped, with an approach measuring 14 feet by 60 feet and a headblock measuring 14 feet by 112 feet. There are depths of 5 to 6 feet along the easterly face of the outer block.

Wreck.—Opposite Belleville, submerged wreckage with about 2 feet of water over it is reported to lie close to the edge of the channel about 800 feet east of Cow Island.

Just east of Belleville there is about 15 feet depth in the channel. Four miles east of Belleville, on the south shore, is **Massasauga Point.** Directly northeasterly on the north shore, is **Point Anne,** with the ruins of a wharf and slip on the point. Abreast of Point Anne is the **Minnie Blakely Shoal,** with about 2 feet depth, marked by a lighted buoy. East of Minnie Blakely Shoal, the waterway opens up into Big Bay.

A slip, 90 feet wide and 200 feet long, formerly used for loading cement and discharging gypsum, is on the northwesterly side of **Big Bay,** about 1 mile northeast of Point Anne. In 1968, there was a least depth of 14 feet in the slip. A buoy about 2,200 feet south of the slip marks the southwest end of a 6-foot shoal.

North Port, Ont.—This village is on the south shore of **Big Island.** North Port Shoal is marked by a lighted buoy on its north edge.

Telegraph Narrows.—A dredged channel through Telegraph Narrows to the north of Telegraph Island Light, for use of boats plying between Belleville and Deseronto, is about 2,100 feet long, running approximately east and west. Telegraph Narrows Range Lights, leading north of Telegraph Island, are located on the south shore to the west of Peterson Wharf. The front light, 62 feet above the water on a pyramidal steel skeleton tower, is on the shoreline. The rear light, 76 feet above the water on a steel skeleton tower is 1,986 feet 082°30′ from the front light, and to the south of Peterson Wharf.

Bridge.—In 1968, a high level bridge was completed from a point in 44°10′21″ N., 77°05′13″ W., in a 000° direction to the opposite shore. The north caisson is marked with a flashing red light and the south caisson

with a flashing green light. The bridge has a vertical clearance of 90 feet under the main span, with a usable width of 150 feet.

Telegraph Narrows East Light, 28 feet above water, with a diamond daymark, is located approximately 4,050 feet 085° from Telegraph Island Light. During 1937 this channel was swept and obstructions removed to a depth of 13 feet and width of 200 feet. During November 1949, a 200-foot wide 600-foot long section of the dredged channel extending westerly from a point 500 feet west of Telegraph Island Light was sounded and swept. Large boulders were removed throughout the area and a controlling depth of 12.8 feet obtained. The channel limits are marked by lights and buoys. Telegraph Island Light is on the north side of Telegraph Island. The dredged channel through Telegraph Narrows is just over one mile in length, and has a least depth of 11 feet.

Deseronto, Ont.—This town is on the north shore of the bay about 15 miles east of Belleville. There is one wharf in poor repair. There is a new marina at Deseronto, with excellent facilities and wharfage for small craft, operating since 1964. The bottom here is rock.

Approximately 600 feet off the southeast side of the port, a channel for small boats between old sunken cribs is marked by buoys on the west and east sides.

From Deseronto a 120° turn is made into the Long Reach, going almost south on a comparatively straight course, with deep water to Picton. A lighted buoy is moored in about 14 feet of water at the turning point of the channel opposite Deseronto, at a point about 1,300 feet northeast of the east extremity of Foresters Island.

Napanee is situated on the Canadian National Railway, 22 miles east of Belleville; it is about 5 miles upstream on **Napanee River**, which enters the Bay of Quinte just east of Deseronto. There is no bar at the mouth of the Napanee River. The course upstream is crooked and the channel narrow. As a result of dredging at bends and through shoals in the river, a channel having a limiting width of 75 feet and affording draft of about 6 feet has been provided from the Bay of Quinte upstream to a point 1,000 feet above the Napanee fixed bridge at Centre Street. Numerous buoys have been placed to mark the edges of the channel at bends and where shoals exist. No lights are maintained. The dredged channel has not been maintained and silting had reduced the available depths in 1964. In 1968 the Napanee River Channel was reported to have a minimum depth of 6 feet.

Hay Bay, about 6 miles south of Deseronto, extends northeasterly from the Bay of Quinte, and is approximately 10 miles long and ½ to 1½ miles wide. The approach is through deep water of the Bay of Quinte. The depth of water in Hay Bay varies from more than 18 feet near the entrance, to 3 to 6 feet at the northeasterly end. At the entrance to the south is **Thompson Point**. Hay Bay has been sparsely sounded and mariners should exercise caution in those areas where no soundings are shown on the chart.

Picton, Ont.—This town is at the south end of the arm of the Bay of Quinte called Picton Bay. The approach is through this arm or bay, which is about 3 miles long, and in width varying from 300 feet at the south end to 2,000 feet approximately near the north end. There is good water all along until it shoals to 12 feet at **Chimney Point**, about ¼ mile from the wharves. No attempt is made to run here in foggy weather. A channel 300 feet wide has been dredged into the harbour, and its edges indicated by suitable buoys. The harbour has been dredged to a depth of 12 feet. Picton Bay Marina is located at the upper end of Picton Harbour. The marina wharf is 180 feet long, with about 4 feet of water alongside. Gasoline and repairs are available at the wharf. The Government wharf, northward of Picton Bay Marina wharf, on the west side of the harbour, has a total frontage of 259 feet, with a depth of 9 feet. The club house and wharf at the Prince Edward Yacht Club, adjoin the north section of the Government wharf. Across the harbour from the Government wharf is located the wharf and facilities of the Prince Edward Cruising Club. The T-shaped wharf is reported to be 200 feet long, with 6 feet of water alongside the seaward face, and 4 feet of water alongside the inner face. Some silting has taken place in the harbour and approaches and a vessel drawing less than 10 feet may, with caution, proceed into the Government wharf.

Adolphus Reach is the reach of the Bay of Quinte between the northeasterly projection of Prince Edward County and the Canadian mainland. The water in this reach is of good depth. **Glen Island** is at the south side of the entrance to **Carnachan Bay (Bass Cove)**; the channel is not buoyed. A buoy marks the south side of the shoal off the west end of Glen Island. South of Glen Island, a lighted buoy marks the northerly edge of Whaleback Shoal and a light, 30 feet above the water, is located on a white mast at the outer end of Glenora wharf on the south side of the reach opposite Youngs Point. To the northeast, on the south side of the reach opposite **Lyons (Bass) Island**, a lighted buoy marks the northerly limit of Keith Shoal. A light, 26 feet above the water, is located on Allison Wharf, on the northerly side of the reach between Allens Point and Cole Point.

Prinyer Cove, at the east end of Adolphus Reach, on the south shore, affords excellent shelter for vessels, as the depth of water through the "Big Gap" at the entrance is good; there is capacity for any number of vessels. A landing berth in front of the Cressy Canning Co.'s wharf had a depth of 13 feet in 1939.

Charts 14802, 14800.—Indian (formerly Pleasant) Point Light is located on the northeasterly point of **Indian** (formerly **Pleasant**) **Point** and marks the Upper Gap entrance to the Bay of Quinte, between Adolphus Reach and North Channel. An unlighted buoy marks the east end of a shoal about 4,300 feet northeasterly from Indian (formerly Pleasant) Point Light. In the Upper Gap, easterly of Indian (formerly Pleasant) Point, a lighted buoy marks the easterly edge of shoal water on a detached shoal having a least depth of 16 feet and a lighted buoy marks the westerly end of the shoal water southwesterly from **Bluff Point** on Amherst Island. Pig Point is on the westerly

point of Amherst Island and is marked with a light 30 feet above the water. A detached shoal about 2½ miles south of Bluff Point on the east side of the approach to Upper Gap is marked by a lighted buoy. The entrance channel to the fishermen's shelter at Pleasant Point has been deepened to 6 feet.

North Channel is the easterly part of the Bay of Quinte, inclosed between Amherst Island and the main shore; it has a good depth of water throughout.

Canada Cement chimney, 631 feet high, located 1½ miles west of Bath, Ont. provides a good landmark on the north shore of the North Channel.

The Lennox Generating Plant chimney, 679 feet high, located 4½ miles west of Bath, Ont. provides a good landmark along the north shore of the North Channel.

On the north shore of the North Channel is **Bath**, having two dilapidated piers 100 feet long and 200 feet apart, with about 11 feet depth at the easterly one and in a channel entering the mouth of the creek; also a dock 100 feet wide and 150 feet long, with 11 feet depth at the outer end, is located about halfway between the piers and the creek mentioned. Bath Point buoy marks the southwesterly edge of the shoal extending from **Bath Point just east of Bath. At Millhaven** on the north shore of North Channel, and 1½ miles east of Bath, a wharf extends out 96 feet, with 8 feet of water at the landing face. The outer end of the Canadian Liquifuels, Ltd. dock, the outer end of which is formed by three caissons joined by catwalks, with a depth of 36 feet alongside, located 1½ miles easterly of Millhaven is marked by a light and an air whistle fog signal. There is a ferry service between Millhaven and Stella which is on Amherst Island. There is a light and an air whistle fog signal on the north end of the wharf at Stella. The southerly tip of Nicholsons Point is marked by a light, shown from a white circular steel tower with a red top.

Collins Bay is on the mainland north of the Brother Islands and 7 miles west of Kingston. The depth of water varies from 40.0 feet at the entrance of the bay to 4.0 feet at its northeasterly end. A timber crib wharf 96 feet long and 16 feet wide, connected to shore by a 180-foot stone fill, is located on the north shore of Collins Bay about 700 feet east of a concrete bridge over Collins Creek. There is about 8 feet of water on all sides of the wharf. A buoy, located on the westerly side of the bay about 500 feet off shore, marks the outer end of an old partly submerged wharf.

Amherst Island, Ont., is a large island in the extreme northeastern part of Lake Ontario, separated from the Canadian mainland by that portion of the Bay of Quinte known as North Channel.

On the Amherst Island shore is **Emerald**, with a pier having 10 feet of water. **Berdans Shoal**, with about 3 feet least depth over rock, extends ⅜ mile from the shore to eastward of Emerald. Kerr Point Shoal, about awash, and marked by a light mounted 33 feet above the water on a circular white steel tower, lies with its outer edge ⅜ mile from shore about ½ mile westerly from Kerr Point of Amherst Island.

Stella has a public wharf consisting of a landing head 88 feet long and an approach 111 feet long, with about 5 feet of water on its west side.

At the northeasterly end of the island, shoals extend to the northeastward nearly 2 miles, **Salmon Island** being close to the easterly edge and the Brother Islands at the northerly edge. There is a light on **Centre Brother Island** and mariners should pass to northward of the light, as to southward a very shallow area, called **Amherst Bar**, connects the islands with the northeasterly end of Amherst Island. An unlighted buoy is located at the northeast end of the shoal, approximately 3,800 feet 293° from the northeast end of Salmon Island. A lighted buoy is located 450 feet 054° from the northeast end of Salmon Island.

A government wharf on the south side of Amherst Island, on the west side of **Emeric Point**, has a 4½-foot depth of water along the north face. **Big Bar Shoal**, with 8½ feet least depth, gravel bottom is 2½ miles south of Nut Island, the latter lying within the shallow bay in the south shore.

Chart 14800.—Lake Frontage of Prince Edward County, Ont.—Prince Edward County was naturally a large peninsula, now separated from the mainland by the Murray Canal. Its shores are indented with many bays. It is in the northeastern portion of Lake Ontario, and lies generally between the open lake and the Bay of Quinte. The south or Lake Ontario shore is decidedly irregular, marked by numerous indentations and by points with dangerous off-lying shoals.

Unexploded Ordnance.—Submerged unexploded ordnance was confirmed to exist in 1971 within a radius of 1½ miles from a point in 43°59′45″ N., 77°35′30″ W., covering generally the area of Dobbs Bank, Bald Head Island and Weller Bay. Extreme caution should be exercised when operating in this area.

Scotch Bonnet Light is located on **Scotch Bonnet Island**, a small island one mile southwest of **Nicholson Island** and about 10½ miles southeasterly of Presqu'ile Point Light. The light is in the westerly approach to Wellington Bay.

Wellington, Ont.—This village is on the north shore of **Wellington Bay**, and 11 miles by rail southwest of Picton. The harbor has an east pier of close piling 400 feet long and sheet piling 225 feet long, 200 feet of close piling on the west side of the harbor basin, and entrance pier of round piles and stone filling 1,000 feet long, and a timber-crib wharf 310 feet long. The Government wharf, 232 feet long, extends to a depth of 5 feet. The entrance to the harbor is filled in and is navigable only by small boats. In 1961, the channel leading to the wharves had silted leaving a reported depth of one foot.

Athol Bay, 9 miles southwest of Picton, is immediately southeastward of Wellington Bay, from which it is separated by **West** (formerly **Owen**) **Point**; the bay has deep water, but affords little protection from the full force of storms. **Salmon** (formerly **Wicked**) **Point**, the southeasterly entrance point of the bay, is rendered dangerous by a reef extending into the lake nearly 2 miles in a southwesterly direction.

The community of Salmon Point, Ont., is about 2 miles easterly of Salmon (formerly Wicked) Point. At Salmon

(formerly Wicked) Point, there is a government breakwater 12 feet wide and 315 feet long with a depth of 3 feet alongside in 1958, giving protection to small craft.

Point Petre, about 4 miles southeasterly of Salmon (formerly Wicked) Point, forms the southern extremity of Prince Edward County. The point is shoal to about ½ mile off, and there is no landing for boats. Point Petre Light is on the most southerly point of the land. A fog horn and a radiobeacon are operated at the light station.

Prince Edward Point is the southerly of two points at the eastern extremity of Long Point. Prince Edward Point Light is on the extremity of the point, called Prince Edward Point. Opening just north of Point Traverse is a small bay of about 2 acres called Long Point Harbour, which has been improved by dredging a channel and a turning basin in 1963 to a depth of 5½ feet; this provides a small shelter harbor for the locality. In September 1969, there was reported to be only 3½ feet in the entrance channel. The Government wharf in this harbour is of timber crib construction, 18 feet by 60 feet, and located at the inner end of the harbor. In 1972, there was a 3-foot depth alongside. Off the point and nearly connected with it by shoals are the two False Ducks Islands, described below.

Prince Edward Bay is a deep indentation on the eastern side of Prince Edward County, to the northward of Long Point. The entrance to this bay and the waters within are deep and the anchorage is good; it is much used as a harbor of refuge, particularly in the fall. At **Port Milford,** in the southwestern recess of the bay, a channel and a turning basin have been dredged to a depth of 11 feet at Collier's and the Canadian Canners' wharves. At Waupoos, behind **Waupoos Island,** an entrance channel and a turning basin in front of the Waupoos Canning Factory's wharf have been dredged to a depth of 9 feet. There is also a Government breakwater 108 feet long to afford shelter to small craft having maximum drafts of 6 feet. A similar structure is located on the northerly side of Waupoos Island opposite.

Charts 14800, 14802.—False Ducks Islands, Ont., comprise **Swetman** and **Timber Islands,** off Prince Edward Point. Swetman Island is situated about 2½ miles east of Prince Edward Point, and on its east point is False Ducks Light; a fog horn sounds as required. There is landing for small boats only. Along the north shore there is excellent depth of water. **False Ducks Bank,** varying from just awash, as is Duckling Reef, to under 6 feet, is very shallow and rocky, extending from the island over 2 miles to the westward and southwestward, and there is a limiting depth of 12 feet between it and the offshore bank at Prince Edward Point. **Traverse Shoal,** a detached bank with about 7 feet least depth, lies with its northerly end southeasterly 1 mile from Prince Edward Point, and extends thence southerly about ¾ mile. Timber Island is small and lies 1⅜ miles northeast of Point Traverse and about the same distance northwest of Swetman Island. There is deep water all around the island except on a shoal at the southwest end, but no lights or landings. The passage between Prince Edward Point and the islands is marked by buoys.

Submerged Cable.—A submarine power cable commences at a point on Long Point in 43°56′42″ N., 76°53′09″ W., and extends 6,000 feet 071°, thence 4,000 feet 099° thence 5,000 feet 109°, thence 076° to Swetman Island.

William Shoal, Ont., with 12 feet least depth and marked by a buoy on its southwest end, lies with its north end 1½ miles 129° 15′ from False Ducks Light, and extends thence about one mile to the southwest. **Harris Shoal,** with 15 feet least depth, bears 2 miles southeasterly from False Ducks Light, and **Psyche Shoal,** with 19 feet least depth and marked by a lighted bell buoy, is ¾ miles farther on the same line. Main Duck Island Lighted Buoy is located 11,000 feet 242° from Main Duck Island Light to mark the most westerly edge of the shoal area extending west from Main Duck Island.

Main Duck Island, Ont., is 11 miles east of Prince Edward Point and about 8 miles west of Galloo Island, N.Y. The water is deep along the north shore and shallow to about ¾ mile off along the south shore and at the west end. A channel 6 feet deep has been dredged to Cole's wharf, and a channel 6 feet deep thence to the inner harbor. On the west extremity of the island is Main Duck Island Light, a fog horn sounds as required, and a radiobeacon is operated at the light station. The southeast edge of the shoal area off Main Duck Island is marked with a buoy outside the 30-foot contour.

Yorkshire Island, Ont., about 50 acres in size, lies off the east end of Main Duck Island, about 1,240 feet distant. The passage between is shoal.

Charts 14768, 14802.—Pigeon Island, Ont., is a small island with quite extensive shoals, about 4 miles from Long Point at the head of Wolfe Island, in the wide water just off the entrance to the St. Lawrence River and near the route of vessels going from Oswego to Kingston. There is a light on the island.

Simcoe Island, Ont., is situated in the entrance to the St. Lawrence River, just off the northwest corner of Wolfe Island; it is 3½ miles long from southwest to northeast and from ½ to 1 mile wide. On its southwest end is **Nine Mile Point** marked with a light; a fog horn sounds as required. The southeasterly face of the island is deep-to, and between this face and the shore of **Horseshoe** and Wolfe Islands, opposite, is a narrow passage of deep water called **Boat (Bateau) Channel,** which, however, terminates at its northeasterly end in the shoal water connecting Wolfe Island and the northeasterly end of Simcoe Island. On the southerly side of Simcoe Island, about one mile from the northeastern end, is a marshy indentation and a small island off shore thereof. An entrance channel, dredged to 7 feet, leads past the westerly end of the island into a small basin containing the wharf of Belyea Bros. Also on the south shore of the island, about ⅝ mile from the easterly tip, is a municipal wharf extending into Bateau Channel about 90 feet from shore, having a frontage of 65 feet with available depth of 10 feet. A cable ferry is operated in this area between Simcoe Island and Wolfe Island.

From **Four Mile Point,** the limestone bluff at the northwest corner of Simcoe Island, a broad shallow bank ex-

tends to the northwestward 1¼ miles, marked by a buoy off its northwesterly side. **Snake Island** is situated near the northwest corner of the bank, and an old pier marked by a buoy, is located about 2,800 feet northwest of Four Mile Point; there is an available depth of about 13 feet across the inner portion of the bank, within about ½ mile off the point. **Middle Ground** is a shoal with 13 feet least water, located 1¾ miles north of Nine Mile Point Light and about 1⅝ miles westerly from Four Mile Point.

Melville Shoal, situated about ⅝ mile westward of the Middle Ground and about midway between the northerly ends of Simcoe and Amherst Islands, is a rocky bank with dimensions of 1¼ miles northeast and southwest and maximum width of about ½ mile, and awash at chart datum. It is now recommended that vessels drawing over 24 feet use the deep water channel west of Melville Shoal when entering or leaving Kingston Harbor. This channel has recently been marked with lighted buoys.

Submarine Pipeline.—A submarine pipeline was constructed in 1968 commencing at a point on the shore in 44°12′29½″ N., 76°32′59½″ W. The pipeline extends 1,850 feet 172° and is not marked.

Carruthers Point Range Lights at Cataraqui Bay, about 3 miles west of Kingston, lead in from Lake Ontario to the north channel approaching Kingston and the head of the St. Lawrence River. The front light is on the southwest extremity of **Carruthers Point** (the westerly entrance point of Cataraqui Bay). The rear light is in the window of the elevator, 4,500 feet 046°10′ from the front light.

Water Supply Intakes.—A buoy placed in 85 feet of water about 2,100 feet south of Carruthers Point Front Range Light, marks the vicinity of the cribs on the outer end of the intake pipes of the Canadian Industries, Ltd. The intake pipes extend into the lake from the south extreme of Carruthers Point about 1,950 feet on bearings of 177°30′ and 165°. A large sign marks the shore end, and vessels should not anchor in the vicinity of the pipes.

A submerged pipeline extends south 1,550 feet from a point about ⅝ mile west of Carruthers Point Front Range Light. The intake crib is marked by a buoy.

Cataraqui Bay.—At the entrance of Cataraqui Bay, west of Kingston Harbor, a rubblemound breakwater 2,560 feet long and rising 8 feet above water surface, with a lighted buoy at its outer end, provides protection to vessels at the Kingston Grain Elevator Co. Ltd. elevator. In August 1978, an obstruction was reported in the entrance to the bay in about 44°12.7′N., 76°31.9′W. In 1961 the slip on the westerly side of the elevator, 250 feet in width, was dredged to 20 feet and the slip on the easterly side of the elevator, 300 feet in width, was dredged to 25 feet with corresponding depths in the approaches.

The James Richardson wharf, which lies approximately 600 feet easterly of the Kingston Grain Elevator Co. Ltd. wharf, was dredged in 1960 along its westerly side to 19 feet for a length of 600 feet with varying widths.

At **Portsmouth**, a cribwork wharf 685 feet long is located on the west side of the shallow bay west of Portsmouth Penitentiary. The wharf was extended 400 feet 135° and a light established at its outer end in 1975. On the eastern side of this bay is a wharf 315 feet in length with a depth of 16 feet alongside. This wharf cannot be used without permission of penitentiary authorities.

Penitentiary Shoal, an isolated shoal with a least depth of 10 feet, is located about ½ mile south of the mainland abreast of Portsmouth Penitentiary. It is marked on the northerly side by a lighted buoy.

The area to the east of Penitentiary Shoal and the islands generally in the eastern end of Lake Ontario, is described under the heading of the St. Lawrence River.

6. LAKE ERIE

Depths and vertical clearances under aerial crossings and bridges herein given are referred to Low Water Datum, which for Lake Erie is an elevation 568.6 feet above mean water level at Pointe-au-Pere (Father Point), Quebec, on International Great Lakes Datum (1955).

DIMENSIONS, ETC.

Length, steamer track, Detroit River Lighthouse to Buffalo ---------- miles--	236
Length (right line), clear of Point Pelee and Long Point ---------- miles--	241
Breadth (right line), Ashtabula to Port Talbot ---------- miles--	57
Depth, maximum recorded by NOS -------- feet--	210

Areas in square miles:	*United States*	*Canada*	*Total*
Water surface of lake -----	4, 980	4, 930	9, 910
Entire drainage basin ----	23. 000	9, 650	32, 650

GENERAL DESCRIPTION

Physical Description.—Lake Erie is the most southerly as well as the most shallow of the five Great Lakes. It forms a waterway between Lake Ontario, via the Welland Canal, and the Connecting Channels from Lake Erie to Lake Huron. The flow of water in the lake is generally from the Detroit River outlet at the westerly end of the lake, in a northeasterly direction to the main outflow channel through the Niagara River.

The distance from Buffalo at the easterly end of the lake to Toledo at the westerly end is 241 miles while the greatest width is about 57 miles.

The maximum depth in Lake Erie is 210 feet at a point just southeast of Long Point, Ontario and with an average depth of 62 feet over the entire lake. Generally, the deepest part of the lake is at the eastern end, while the island region at the westerly end is the most shallow.

During the winter, the ice forms very heavy along the shore line and extends some distance into the lake. In addition, the westerly end, or island region, is often quite solidly iced over except for vessel channels through the ice provided by repeated passages.

An extensive waterborne commerce activity is carried out between the various ports on the lake as well as to and from the other lakes.

Movement Control of Vessels.—In 1969, the St. Lawrence Seaway Authority expanded its vessel traffic control into the eastern portion of Lake Erie from Port Colborne to Long Point. This traffic control was initiated to provide the following: A more efficient scheduling of vessel traffic transiting the Seaway system, an efficient search and rescue coverage, general marine weather broadcasts, and vessel location information to the Trade and the public.

Radio coverage in the eastern portion of Lake Erie is provided by a radio station located at Port Colborne, Ontario, which covers the area between Port Colborne and Long Point.

All vessels, other than pleasure craft of less than sixty-five feet, in transit between a point abeam of Long Point and Port Colborne or other Ports in this area are required to participate in the Lake Traffic Control. The "Seaway Handbook" lists the assigned frequency to maintain, call-in points and required message content and times of weather broadcasts.

Anchoring of Vessels.—Cautionary Notice.—When coming to anchor vessels masters are cautioned not to foul submarine cables. Fouling cables may not only result in disrupting utility services to adjacent communities but also expose the mariner to the danger of high voltages carried by certain cables. Mariners are advised to slip the anchor rather than cut the cable if the normal practice of good seamanship fails to clear the fouled anchor. Lost gear or damaged cables should be reported to the authority having jurisdiction over the waterway.

Improvement Work.—Originally a few harbors of the lake were formed by natural bays, but for the most part the harbors were found within the mouths of streams and were obstructed by bars at the entrances. As a result of Government, municipal, and private work, numerous harbors have been improved to accommodate the present large lake vessels. The harbor works have consisted in dredging entrance and inner harbor channels and protecting them by piers and revetments, and in constructing breakwaters in the lake and deepening the inclosed areas in order to afford anchorage and mooring facilities and form commodious harbors outside of the contracted harbors within streams.

The commerce of the lake nearly all centers at the mouth of the Detroit River, from which it radiates to the Welland Canal, Niagara River, and the various lake ports. The greater portion of traffic proceeds to the north of the island region in the western end of the lake, through Pelee Passage between Point Pelee and Pelee Island; this is the most important channel of the lake and is suitably marked by the Canadian Government.

Fluctuations of Water Level.—The average or normal elevation of the lake surface varies irregularly from year to year. During the course of each year the surface is subject to a consistent seasonal rise and fall, the lowest stages prevailing during the winter months and the highest stages during the summer months.

In addition to the annual fluctuation there are also oscillations of irregular amount and duration produced by storms. Some, with periods of a few minutes to a few hours, are the results of squall conditions, the fluctuations being produced by a combination of wind and barometric pressure changes that accompany the squalls. At other times the lake level is affected for somewhat longer periods, such as many hours or a day, by strong winds of sustained speed and direction which drive the surface water forward to raise its level on the lee shore and lower it on the weather shore. This type of fluctuation has a very pronounced effect on Lake Erie, because it is the shallowest of the Great Lakes and affords the least opportunity for the impelled upper water to return through reverse currents beneath the depth disturbed by storms. As a result, the water level in the harbors, particularly those near each end of the lake fluctuates markedly under the influence of the winds, varying with the direction, strength, and persistence of the latter. At the eastern end of the lake westerly winds pile up the water in Buffalo Harbor and increase the depth in the Niagara River, while easterly winds drive the water out of Buffalo Harbor and lessen the flow and depth of the Niagara River. The winds produce exactly the reverse effect at the western end of the lake, their maximum effect being at Sandusky, Toledo, and the mouth of the Detroit River, as especially noted in the descriptions of these localities. Intermediate points are not subject to as great changes of level due to wind as those at the ends of the lake, and for other harbors on the south shore of the lake it may be stated in a general way that the wind fluctuations are usually less than 1 foot either way from the normal stage at the time; in rare instances an extreme fluctuation of about 2 feet may be produced.

Under the heading of Buffalo Harbor are given some data concerning the stages of water for a number of years, the maximum wind-produced fluctuations, etc., as observed at Buffalo. The changing stages of the lake, as well as the fluctuations due to wind, must be considered by mariners in connection with the depths of water shown on the National Ocean Survey charts. The lowest water in the lake during the period of navigation (April to December) is always in the spring and fall, and it is during these times that storms are most frequent and severe.

Weather Conditions.—Lake Erie is comparatively shallow and, due to trend of its long axis, southwesterly or northeasterly strong winds and gales which sweep over it quickly raise dangerous seas. Its water temperature in the annual cycle fluctuates the most widely of all of the Great Lakes, ranging from 32° F. (0° C.) in the winter to about 72° F. (22° C.) in the late summer. The highest wind velocity, as derived from long-time records of the National Weather Service for certain shore stations, is 79 knots (91 miles per hour) from the southwest at Buffalo, N.Y., in January 1950; the shore-station values are subject to the condition that the free flow of the wind is diminished by land friction. The highest velocity as observed on anemometer-equipped vessels while more than 6 miles offshore was 87 knots (100 miles per hour) on July 4, 1969; but such records began in 1941 and self-recording data over a long period, which would register higher winds, are not available. From records of the Atmospheric Environment Service of the Canada Department of the Environment (formerly Meteorological Branch of the Canadian Department of Transport), maximum observed wind speeds are noted below in sequence, of station, speed, direction, date. These are sustained speeds over a one-hour period at airport locations (A) but one-minute averages at all other stations, and do not show maximum gusts which may be much higher. The speeds are in knots, with the value in miles-per-hour in brackets: Clear Creek 56 (64) SW, Jan. 1959; Simcoe A 46 (53) WSW, Feb. 1967; Long Point 63 (72) SW, Dec. 1921; Port Colborne Light 53 (61) SW, Nov. 1966; Southeast Shoal 52 (60) NE, Apr. 1970.

Separate Steamer Lanes for Vessels.—The Lake Carriers' Association and the Dominion Marine Association have prescribed, for vessels enrolled in the associations, the following separation of routes for upbound and downbound traffic in Lake Erie.

Downbound: Vessels leaving the Detroit River for ports east of Middle Ground Shoal shall continue on course 164° until ⅞ mile beyond East Outer Channel Lighted Buoy 1, thence 27 miles on 095½° for Pelee Passage Traffic Lighted Bell Buoy, thence 122° to pass south of Southeast Shoal Light.

Downbound vessels for Port Colborne or Buffalo from point of departure, Southeast Shoal, shall lay a course to a point not less than 9 miles off Long Point, thence to destination.

Upbound vessels: From Port Colborne or Buffalo, bound to Southeast Shoal, lay a course to pass not more than 3 miles off Long Point, thence to Southeast Shoal.

Upbound vessels from Port Colborne or Buffalo to a point on South Shore, Lake Erie, east of Marblehead, lay a course to pass not over 5 miles off Presque Isle Light, thence to destination.

Upbound vessels for Detroit River, departing from a position 1 mile south of Southeast Shoal Light, vessels shall steer 302° for 8½ miles to a position 2 miles 329½° from Pelee Passage Light, thence 26 miles on 275½° for East Outer Channel Lighted Buoy 1.

For Toledo and Monroe, when 1 mile off Pelee Passage Light, steer 272° to pass approximately 1½ miles off Middle Sister Island Light, thence to destination.

It is understood that masters may exercise discretion in departing from these courses when ice and weather conditions are such as to warrant it.

The recommended courses are designated on the general chart No. 14820, Lake Erie.

DETAILED DESCRIPTIONS OF COAST LINE, HARBORS, ISLANDS AND REEFS

Section I.—South Shore from Buffalo, N.Y., to Erie, Pa.

Charts 14822, 14832, 14833.—Buffalo Harbor, N.Y.—This harbor is located at the eastern end of Lake Erie, where it converges to an open and comparatively shallow bay about 8 miles across north and south and is subject to great storms from the southwest. The lake discharges into the Niagara River at the northeast corner of this bay. The city of Buffalo is situated along the east lake shore and the east bank of the head of the Niagara River. The Buffalo River meanders through the city from east to west and enters the lake near the head of the Niagara River.

Fluctuations of Lake Erie at Buffalo.—The water level of Lake Erie at Buffalo is frequently affected, usually for periods of less than 12 hours, by strong southwesterly or northeasterly winds. The records of gage readings at the south pier show that since 1900, the highest water recorded was on November 3, 1955 when 10.5 feet above the plane of Low Water Datum was reached. The lowest recorded level was 4.4 feet below Low Water Datum on 10 March 1964. The extreme range of fluctuation during this total period was 14.9 feet. The greatest range for any one year was 12.2 feet in 1909, with a high stage of plus 11.9 feet on December 7 and a low stage of minus 1.3 feet on February 14. The least range for any one year was 6.0 feet in 1963, with a high stage of plus 4.4 feet on January 20 and a low stage of minus 1.6 feet on March 10. The highest and lowest stages for any one month have at times occurred on the same date, and the highest and lowest for the year may be but a few days apart. In 1946 the highest and lowest for the year both occurred on December 29, with a range of 7.3 feet between plus 7.0 feet and minus 0.3 foot.

The records of the monthly mean stages at Buffalo show that the periods of lowest water during the navigation season are in the spring and fall, the latter being the busiest time of the year in the harbor, when the necessity for deep water is greatest.

Channels.—A Federal project provides for an outer harbor formed by breakwaters parallel with the shore and an inner harbor comprising the Buffalo River and the Buffalo Ship Canal.

Buffalo Outer Harbor has entrances at the north and south ends. From deep water in Lake Erie, **Buffalo Harbor North Entrance Channel,** marked by lights and buoys, extends northeastward into Outer Harbor and thence into two waterways, Black Rock Canal and Buffalo River. Federal project depth in the channel is 25 feet. There is a strong northerly current across this channel; navigators should guard against this by holding up toward the south. **Buffalo Harbor South Entrance Channel,** marked by lights, extends southeast from deep water in the lake to Outer Harbor and thence into two canals, Union Canal and Lackawanna Canal. Federal project depth in the channel is 30–29 feet. (See Local Notice to Mariners and latest edition of charts for controlling depths.)

Buffalo Outer Harbor provides a safe harbor of refuge and anchorage and is also used extensively by large lake vessels as a channel. Vessels seeking anchorage and small vessels passing along the breakwaters are cautioned against approaching them nearer than 100 feet in order to avoid striking the stone riprap. Federal project depths in Outer Harbor are 23 feet in Northern Channel, 27 feet in Middle Channel, 28 feet in Southern Channel, and 23 feet in the turning basin. (See Local Notice to Mariners and latest edition of charts for controlling depths.)

Lackawanna Canal, marked at the entrance by private lights, extends southward for 0.75 mile from the south end of Outer Harbor. In 1973, the controlling depth was 25 feet with 24 feet along the dock on the west side and shoaling to 22 feet at the south end.

Union Canal, marked by private lights, extends eastward for about 0.8 mile from the south end of Outer Harbor. In 1973, the midchannel controlling depth was 20 feet.

Buffalo Inner Harbor comprises Buffalo River and Buffalo Ship Canal. The dredged section of **Buffalo River** extends southeastward and then generally eastward for about 5.8 miles from the north end of Outer Harbor to the ConRail railroad bridge. Federal project depth is 22 feet. However, the river is subject to extensive shoaling. (See Local Notice to Mariners and latest edition of charts for controlling depths.) Above the ConRail bridge, depths are 5 to 15 feet to the mouth of **Cazenovia Creek** and thence 1 to 6 feet to the Bailey Avenue Bridge. Submerged rocks immediately above Bailey Avenue Bridge render navigation for even small craft very hazardous.

Buffalo Ship Canal extends southeastward for about 1.4 miles from the inner end of Buffalo River Entrance Channel. The Federal project depth is 22 feet for about 1 mile. (See Local Notice to Mariners and latest edition of charts for controlling depths.)

Black Rock Canal Entrance Channel, marked by lights and buoys, extends northward from the north end of Outer Harbor. Federal project depth is 21 feet. (See Local Notice to Mariners and latest edition of charts for controlling depths.) **Black Rock Canal** is the navigable channel of the upper Niagara River as far north as **Tonawanda** and is discussed more fully under Niagara River above Niagara Falls. The Lake Erie (western) terminus of the Erie branch of the **New York State Barge Canal System** is at Tonawanda.

Aids to Navigation.—The Buffalo Harbor Traffic Lighted Bell Buoy, with black and white vertical stripes, and showing short-long flashing white, is located in 36

feet of water approximately 2½ miles 269° from the South Entrance at the junction of the prolongation of the center lines of the North and South Entrance Channels to Buffalo Harbor.

North Entrance—Main harbor entrance lights: Buffalo Harbor Light, on the northwesterly side of the entrance channel, is located at the southeast end of the west breakwater: a diaphragm fog horn and a marker radiobeacon are operated at this station. Buffalo Harbor North Side Light is located 2,420 feet 029° from Buffalo Harbor Light and Buffalo Harbor South Side Light is located 1,070 feet 146½° from the North Side Light; these mark the gap in the old breakwater through which the North Entrance Channel passes.

Minor outer lights: Buoys approximately 3,600 feet lakeward of the west breakwater mark the opposite sides of the entrance channel. A buoy marks the channel opposite Buffalo Harbor Light. Buffalo Harbor West Breakwater Light is located 1,770 feet 333° from Buffalo Harbor Light on the northwesterly end of the west breakwater. Buffalo Harbor Old Breakwater North End Light is located 430 feet 333° from Buffalo Harbor North Side Light at the northwesterly end of the old breakwater. Buffalo Intake Crib Light and Middle Reef Lighted Buoy lie west of the harbor entrance and are described under Section VIII, Upper Niagara River. (See index.)

Inner harbor lights: Buffalo Coast Guard Slip Light is located at the north end of the Coast Guard Pier, 1,790 feet 048° from Buffalo Harbor South Side Light on south side of the Buffalo River entrance. Buffalo River Entrance Light, close northeast on the same side, marks the turn into the river. Northerly from these on the opposite side of the river is Buffalo River Junction Lighted Buoy which also marks the easterly side of the entrance to the Black Rock Canal. On the westerly side of the Canal entrance is Buffalo North Breakwater South End Light located 1,550 feet 023° from Buffalo Harbor North Side Light.

Submarine electric power and control cables cross the north end of the outer harbor from the Coast Guard Base, westerly to the Old Breakwater North End. Two signs lettered "U.S. Coast Guard, Do Not Anchor-Cable Crossing" are located on the Coast Guard Base.

South Entrance.—South Buffalo North Side Light is on the southerly end of the breakwater, on the north side of this entrance. South Buffalo South Side Light is on the angle of Stony Point breakwater; a radiobeacon is operated at this station. South Buffalo Pierhead Light is on the outer end of the lake arm of Stony Point breakwater; a diaphragm fog horn sounds continuously.

Anchorage of Vessels in Buffalo Outer Harbor.—The harbor area is all good anchorage ground, except that the bottom south of the middle gap is very soft clay. There are about 22 large mooring rings on 3,200 feet of the old breakwater adjoining the north harbor entrance, and 25 on 1,800 feet of the south breakwater adjoining the south harbor entrance. Vessels are permitted to moor to the breakwater with manila or synthetic lines, but not with wire rope or chains. Vessels are requested not to anchor northward of berthing area 11. Vessels not greater than 550 feet in length will be permitted to anchor in berthing areas 11 to 17 inclusive. However, no anchorage will be permitted in berthing areas 11 to 24 inclusive until such time as vessel traffic to the Niagara Frontier Transp. Auth. pier at the foot of Michigan Street has terminated for the season, and then only by permission from the District Engineer, U.S. Army Engineer District, Buffalo, Corps of Engineers, Buffalo, New York. Anchorage will be permitted in berthing areas southerly of berthing area 24 with no restrictions as to length of vessel. The berthing areas are all marked by means of large orange numbers painted on the harbor face of the breakwaters. (See Federal Regulations, references following.)

Dangers.—Waverly Shoal, lying in the approach to Buffalo Harbor and the Niagara River, has a least depth of 10 feet; it is marked close southerly of its shoalest spot by a buoy, located 1⅞ miles 251° from Buffalo Harbor Light. Within the 19-foot contour, the shoal extends from the buoy northeasterly for about 1,800 feet and southerly for about 4,400 feet, and its maximum width is about 1,200 feet. For about 900 feet southerly from the buoy, the limiting depths are from 14 to 18 feet, and thence southerly a depth of 18 feet or more prevails to the southerly end.

An unmarked rocky shoal, with a least depth of 20 feet, lies at a point 1.4 miles 230° from Buffalo Harbor Light.

Currents.—There is very little current in the outer harbor except during sudden fluctuations of water level, which may cause considerable current, especially in the entrance channels.

Beginning at a point about 1,000 feet downstream of the junction of the Buffalo River and Buffalo Ship Canal and extending to a point about 2,200 feet upstream of the Michigan Street bridge, the river bottom is soft clay and mud overlying rock to a depth ranging from one to several feet. Vessels grounding in this portion of the river seldom suffer damage due to contact with the bottom. Above the point mentioned and as far as the upstream end of the Int'l Multifoods Co. (Int'l Milling Co.) dock, the channel is cut through solid rock.

The currents in the river are reported to reach velocities of 3 to 5 m.p.h., changing direction and velocity abreast Buffalo Ship Canal. Rapid fluctuations in Lake Erie produce quite strong currents in the river within one mile of the mouth, inflowing or outflowing as the case may be, and heavy rainfalls and spring freshets are attended by strong outflowing currents due to rapid rises of the river and the consequent discharge of flood water. These conditions cause difficulties to navigation and sometimes damage to vessels by tearing them from their moorings, but occur only two or three times each year and for only a few hours at a time.

Ice.—Heavy ice forms in the river, usually in January. A narrow channel is kept open through the ice by tugs, but the ice remains in place because the eastern end of Lake Erie also freezes over, and the harbor entrance is usually blocked with ice from January to March or April. The ice usually goes out in the spring during a freshet in the river, and the combined effect of the then prevailing strong out-

flowing currents and the heavy moving ice is at times very great and may last for two or three days. During this time the liability of damage to vessels is considerable.

Heavy ice forms in the Buffalo Ship Canal in winter, usually in January. A narrow channel is kept open through the ice by tugs, but the ice remains in place, the same as in the Buffalo River. The ice drifts out on the opening of the entrance channel in March or April, or melts in place, and its breaking up in the spring is not attended with the same liability to damage as in the case of the Buffalo River.

Harbor Facilities.—The Outer Harbor from the north end of the Old Breakwater North End, located 450 feet northerly of the North entrance channel, to the south entrance, South Buffalo South Side Light, is 3.4 miles long. There is an established United States harbor line, 1,600 feet from and parallel to the breakwater. The area of this outer harbor is about 715 acres.

Erie Basin.—This basin, controlled by the city of Buffalo, is located just north of the mouth of Buffalo River. It is formed by the city of Buffalo (formerly New York State) breakwater, a stone structure 1,840 feet long extending in a northwesterly direction from near the Buffalo River entrance channel and enclosing an area of about 2,500 feet long and from 300 feet to 1,000 feet wide. The city of Buffalo has developed the area as a small-boat basin known as the Erie Basin Marina. A pumpout facility is available in this basin.

Niagara Frontier Transportation Authority.—Seaway Pier 1 of this agency is about 4,000 feet south of the north entrance of Outer Harbor. Seaway Pier 2 is immediately south of Pier 1. Pier 1 has a 1,168-foot north face with 25 to 26 feet alongside; a 200-foot west face with 27 feet alongside and a 1,187-foot south face with 18 to 27 feet alongside. Pier 2 has a 1,179-foot north face, 24 to 27 feet alongside, and a 76-foot west face with 27 feet alongside. Terminals A and B of the Niagara Frontier Transportation Authority adjoin, and are about 1.1 miles south of Seaway Pier 1. Their combined west face is 1,400 feet long with 17 to 27 feet alongside; the 1,000-foot south face has 14 to 27 feet alongside.

A small-boat harbor protected by a dike is maintained by this agency just south of Terminals A and B. An additional enclosed dike area contiguous to the small-boat harbor dike and extending southerly therefrom is maintained for the disposal of dredged material.

Extending southerly from the north entrance, a measured mile (statute and nautical) is marked on the harbor face of the breakwater.

Intake Pipeline.—An intake pipeline commences on the shore and extends 1,600 feet, through the mouth of the above small-boat harbor, to an unmarked intake crib covered 17 feet.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Buffalo, N.Y. is contained in the **Port Series No. 41 (Revised 1971)** published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Coast Guard Station.—Buffalo Coast Guard Station is located on the south pier at the mouth of the Buffalo River.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. An intake tunnel of the Buffalo Waterworks, commences at a point on the Black Rock Canal 600 feet 200° from the southerly waterworks stack, and extends 6,280 feet 210° to the Buffalo Waterworks intake crib in about 14 feet of water. The crib is about 3,700 feet 281¼° from the Old Breakwater North End, and is marked with a light maintained by the City of Buffalo.

Captain of the Port Area.—See 33 C.F.R. § 3.45–55 of Rules and Regulations, preceding.

Anchorage Regulations.—See 33 U.S.C. 471 published in Certain Laws, preceding, and 33 C.F.R. § 110.1, 110.84b, and § 110.208 of Rules and Regulations, preceding.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding, and 33 C.F.R. § 117.707 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.170 and § 207.580 of Rules and Regulations, preceding.

Local Harbor Regulations are established by the Corporation Counsel and enforced by the **harbormaster** who may be reached at City Hall. Vessels shall not approach or pass any moveable bridge at a speed exceeding 3 m.p.h. Copies of the regulations may be obtained from the Corporation Counsel, City Hall, Niagara Square, Buffalo, N.Y. 14202.

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Bridge Regulations

Sec. 305. Bridge Control and Traffic.

(1) The bridgetender or person in charge of any bridge over any portion of the harbor shall change the semaphore vessel signal to show green instead of red to acknowledge vessel signal for opening bridge, if bridge can or will be opened for such signal, clear bridge, close highway barriers, if any, and unlock bridge. The failure to at once change semaphore vessel signal shall indicate that the bridge will not be immediately opened in reply to such signal. When all is clear the bridge operator shall blow one blast of the bridge whistle to show that the bridge is to be raised; two blasts, that bridge is to be lowered.

(2) Whenever, between 6:30 a.m. and 8 p.m., at movable bridges over any portion of the harbor, persons, teams, or vehicles have been delayed at said bridge 10 minutes by reason of any such bridge being open for a vessel to pass, it shall be the duty of the bridgetender or other persons in charge thereof to give said signals and immediately close said bridge and keep it closed 10 minutes for such persons, teams, or vehicles to pass, if so much time shall be required, when said bridge shall be opened again and kept open for a like period, if necessary, for vessels to pass, and so on, alternately, if necessary, during the hours aforesaid.

(3) No person shall drive or attempt to drive any animal or vehicle onto or across the draw of any bridge over any portion of the harbor while the same is opening or shutting, or after the signal for the opening thereof and

Structures Across The Buffalo Waterways

No.	Location and name	Kind	Miles above North Breakwater South End Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Buffalo River								
	Turning basin (lower end).		0.68						
	Buffalo Ship Canal	Junction	.97						
1	Buffalo Skyway Bridge	Highway	1.00			215.0	100.0		See note 1.
2	Submerged cables (16) (Nia. Mo. Pow. Corp.)	Electric	1.09						Approx. depth 25.0 feet. (4" pipe).
3	Submerged pipeline (City of Buff.)	Water	1.31						Approx. depth 27.7 feet. (16"dia.).
3A	Submerged pipelines	Air	1.34						See note 10.
4	Michigan Street Bridge	Highway	1.34			177.0	20.0		See note 2.
5	Tunnel (City of Buff.)		2.09						Approx. depth 50.0 feet to top.
6	Ohio Street Bridge	Highway	2.10			251.0	18.6		See note 3.
7	Aerial Cable		3.40				133.0		
7A	Submerged cable								Approx. depth unknown.
8	Submerged cables (2) (Penn Central)		4.01						Approx. depth 33 feet.
9	Penn Central (NYC)	Railway	4.02			100	18.4		1-leaf bascule. See note 4.
10	Submerged cables (Out of service)		4.37						Approx. depth 24.4 feet. (3 pipe conduits and cable)
11	Norfolk & Western Ry. and Penn Central.	Railway	4.39			97	12.4		1-leaf bascule. See note 4.
11A	Submerged cables (3) (Out of service)								Approx. depth 24.4 feet.
11B	Submerged cables (3) (N & W RR)								Approx. depth 29.0 feet.
12	Submerged cables		4.39						Approx. depth 27 feet. (3 pipe conduits).
13	Buffalo Creek RR	do	4.39			97	12.4		1-leaf bascule. See note 4.
14	Submerged cable (Buff. Cr. RR)		4.42						Approx. depth 30 feet.
15	Submerged pipeline		4.70						Approx. depth 35 feet. (10" dia.).
15A	Submerged pipelines		5.06						
16	Erie Lackawanna RR	Railway	5.07			112.5	36.8		1-leaf bascue. See note 4.
17	Submerged cables (Erie Lack. RR)		5.08						Approx. depth 32.7 feet. (6 pipe conduits).
18	do		5.21						Approx. depth 30.8 feet. (9 cables).

See notes following.

Structures Across The Buffalo Waterways—Continued

No.	Location and name	Kind	Miles above North Breakwater South End Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Buffalo River—Con.								
19	South Park Avenue	Highway	5.22			200	19.0		See note 5.
20	Submerged cables and pipeline.		5.23						Approx. depth 35 feet.
21	Erie Lackawanna RR	Railway	5.79			104	25.1		1-leaf bascule. See note 6.
22	Aerial cable		5.80						Data not available.
23	Submerged pipelines		5.81						Approx. depth 23 feet. (2 cables).
24	Aerial pipelines		6.00				102.2		
	Cazenovia Creek	Junction	6.09						
25	Bailey Avenue	Highway	6.24			91	17.8		Fixed. Pipeline across bridge.
25A	Submerged pipeline (36″ dia.)	Water	6.33						Approx. depth 12 feet.
26	Submerged pipeline		6.50						Approx. depth 6 feet.
	Cazenovia Creek								
	Buffalo River	Junction	6.09						
27	Aerial cable		6.19						Data not available.
28	Bailey Avenue	Highway	6.22				12.0		Fixed.
	Buffalo Ship Canal								
	Turning Basin (Lower End).	Junction	.68						
	Turning Basin (Upper End).	do	.95						
29	Buffalo Skyway bridge	Highway	1.10			193	100		See note 7.
30	Submerged cable		1.26						Approx. depth 30 feet.
31	Michigan Street bridge	Highway	1.28			73.5			See note 8.
			Miles above South Buffalo North Side Light						
	Union Canal								
	Outer Harbor	Junction	0.37						
32	Fuhrmann Boulevard bridge.	Highway	.68			80	9.1		See note 9.
33	Father Baker Memorial bridge. (NY Rt. 5)	do	.70			200	105.4		Fixed.
	Canal end		1.10						
	Lackawanna Canal								
	Outer Harbor	Junction	.39						
34	Aerial cable		.42						Data not available.
	Canal end		1.12						

See notes following.

Signal for Opening Draws, 3 blasts (— — —). Bridge tender changes semaphore signal to show green instead of red if bridge is to be opened; failure to change semaphore indicates bridge will not be immediately opened. Bridge engineer blows one blast of whistle before opening and two blasts before closing bridge. Highway bridges remain closed as follows: Michigan Street Bridge from 7 to 7:30 a.m., 8 to 8:30 a.m., 3:45 to 4:30 p.m., and 5:15 to 6 p.m.; Ohio Street Bridge from 7:30 to 8 a.m., 8:45 to 9:15 a.m.; 3 to 3:45 p.m., and 4:30 to 5:15 p.m.; South Park Avenue Bridge from 7 to 8:30 a.m. and from 4:30 to 6 p.m.; Bailey Avenue, from 6:30 to 7:30 a.m. and from 5 to 6 p.m. The closed periods shall not be effective on Sundays, New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving, Christmas or days observed in lieu of any of these holidays under State law. (See Sec. 305–311 of Harbor Ordinance, below.)

NOTE 1.—Fixed high level: two green lights underneath bridge span in midchannel, one upstream and one downstream; two red lights near each end of bridge span at limits of full horizontal clearance, one upstream and one downstream.

NOTE 2.—Vertical lift: clear height when raised 101 feet. Red light on each end of piers upstream and downstream; one light at center of bridge, upstream and downstream, showing red when bridge is being raised, changing to green when full height of lift is reached.

NOTE 3.—Vertical lift: clear height when raised 105.5 feet. Red light on each end of piers upstream and downstream; one light at center of bridge, upstream and downstream, showing red when bridge is being raised, changing to green when full height of lift is reached.

NOTE 4.—1-leaf bascule: Red light on upstream and downstream end of rolling pier and lift pier. Light on upstream and downstream side of lifting end, swinging with lift, shows red when bridge is closed and green when open.

NOTE 5.—Vertical lift: (right and left refer to sides looking downstream) clear height when raised 95 feet at right channel limit increasing to 100 feet 25 feet channelward of left channel limit and 100 feet at left channel limit. Clear height when closed 19 feet at right channel limit and 20 feet at left channel limit with an increased height of 21 feet over a width of 140 feet 50 feet channelward of the right channel limit and extending within 10 feet of the left channel limit. Red light on each end and at center of each fender; two lights at center of span, one upstream and one downstream, showing red when bridge is being raised, changing to green when full height of lift is reached.

NOTE 6.—1-leaf bascule: Not operated until channel above bridge is opened to traffic.

NOTE 7.—Fixed high level; two green lights underneath bridge span in midchannel, one upstream and one downstream; two red lights near each end of bridge span at limits of full horizontal clearance, one upstream and one downstream.

NOTE 8.—Bridge superstructure has been removed. Abutments and fender protection remain. Red light on upstream and downstream end of each abutment.

NOTE 9.—Single-leaf bascule: Operated by electricity. Red lights on center of bridge show in either direction. Red lights show on each abutment.

NOTE 10.—Three 3½″ diameter plastic pipes on natural bottom as part of air bubbler system.

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before the opening is begun or displayed, or resist the tender thereof in his efforts to keep and promote order and equal convenience to those desiring to cross said bridge.

(4) No person in charge of any animal or vehicle shall permit the same to cross any of the bridges over the harbor at a faster rate of speed than a common walk, except motor vehicles, which shall not be driven in excess of six miles per hour. No person shall drive or assist in driving onto or across any one of said bridges more than 8 head of cattle or horses at any one time in a drove.

(5) No person shall unnecessarily or willfully remain or stop with any animal or vehicle upon any of said bridges or in or upon the approaches thereto. It shall be the duty of every person on foot or in charge of any animal or vehicle to keep to the right when crossing said bridge.

(6) When said bridge has been opened and closed, teams and vehicles shall cross in the following order, namely: Those occupying the street upon which the bridge is situated shall cross first; those occupying the cross streets and upon the right-hand side of the bridge shall cross next; and those occupying the cross streets and upon the left-hand side of the bridge shall cross last. No person shall cross or attempt to cross or break into the line of teams or vehicles while crossing or attempting to cross any such bridge.

(7) All persons are forbidden to gather in assemblies or crowds on any bridge over any portion of the harbor, or the approaches leading thereto, so as to obstruct in any manner the passage of pedestrians, teams, and vehicles across the same, or be and remain upon any of the sidewalks or main passage of any such approach, longer than is necessary to pass the same. No band of musicians shall play or beat time or keep step with each other while they or any procession or body of persons marching with them, or any portion thereof, are upon or crossing any such bridge.

Sec. 306. Bridges Closed—Hours.—The movable highway bridges over portions of the harbor shall not be opened for passage of vessels, other than fire tugs operated by the city of Buffalo, during the times hereinafter specified, except to prevent imminent danger of injury to any such bridge, namely:

Ohio Street Bridge over the Buffalo River, from 7:30 to 8 a.m., 8:45 to 9:15 a.m., 3 to 3:45 p.m., and 4:30 to 5:15 p.m.

Michigan Avenue Bridge over Buffalo River and South Michigan Avenue Bridge over the City Ship Canal, from

7 to 7:30 a.m., 8 to 8:30 a.m., 3:45 to 4:30 p.m., and 5:15 to 6 p.m.

South Park Avenue Bridge over Buffalo River, from 7 a.m. to 8:30 a.m. and from 4:30 to 6 p.m.

Bridge over Union Canal, from 7 a.m. to 8 a.m. and from 4:55 p.m. to 6:10 p.m.

Provided, however, that discretionary power is hereby conferred upon the harbormaster to order the opening of any of said lift bridges at any time during an emergency or to promote public convenience.

Sec. 307. Time to Remain Open.—Whenever any person having charge of any vessel shall wish to move the same past any bridge over any portion of the harbor, reasonable time shall be allowed for opening the same.

Sec. 308. Fire and Police Vehicles—Right of Way.—Whenever at any alarm of fire any fire engine, hose cart, or other fire apparatus shall approach any bridge over the harbor, for the purpose of crossing the same toward such fire, the bridgetender shall, if such bridge is open, close the same as soon as practicable and keep it closed until such fire apparatus shall have had an opportunity to pass over said bridge, notwithstanding vessels may be delayed thereby. All vehicles of the fire department and the police department and vessels operated by either of said departments, shall have the right of way across or through any such bridge over all other traffic.

Sec. 309. Vessel Signals.—It shall be unlawful for the owner, officer, or other person in charge of any vessel to attempt to pass any movable bridge across the harbor while a stop signal is being given or displayed.

The commissioner of public works shall provide and maintain signals at the public highway bridges over the harbor, as required by the U.S. Commissioner of Lighthouses, for the security of navigation.

The owner of any movable bridge over the harbor shall provide and maintain vessel signals, as required by the Commissioner of Lighthouses, or by ordinances of the city of Buffalo, for the security of navigation. During closed seasons of navigation, lights on bridges over the harbor and other structures in the harbor must be exhibited from sunset to sunrise at all times when vessels can enter port or are navigating in the vicinity.

Sec. 310. Railroad Bridges.—For all bascule or swing bridges over any portion of the harbor not carrying highway traffic, when any vessel shall signal for its opening, the bridgetender shall immediately open the bridge, unless a train be on the bridge or approaching it so closely as to be unable to stop, and in that case the bridge shall be kept closed long enough for the passage of one train and no more.

Sec. 311. Signals to Bridgetenders—Size of Whistles.—Every owner or person in charge of any vessel, desiring to pass through a movable bridge over the harbor, shall sound or cause to be sounded a steam whistle to signal bridgetenders to open and swing bridges, and such signal shall be three sharp short sounds of the whistle, to be given in succession as quickly as possible and not to be prolonged, and the whistle used for this purpose shall be of suitable size to be heard.

Sec. 312. Steamboat Whistles.—No person, firm, or corporation shall blow or cause to be blown the steam whistle of any vessel, for any purpose whatever, while lying at any wharf or dock in the city of Buffalo, or when approaching or leaving such wharf or dock, or when passing through any drawbridge over the harbor, or when running in the harbor, except when necessary as a signal of danger and in cases and under circumstances prescribed by the laws and regulations of the United States and by the ordinances of the city of Buffalo.

No captain or person in charge of a vessel in the Buffalo harbor shall permit any whistle upon such vessel to be blown except for the purpose of giving and answering signals; and no "four whistles" shall be answered by any vessel while lying at the dock.

Coast Chart 14822.—From **Stony Point,** the southerly terminus of the Buffalo breakwater system, the coast trends southerly for 3¼ miles, and is obstructed within the mile limit by shallow patches, including a diked disposal area and a dumping ground.

The disposal area is enclosed by a stone rubble mound dike which begins at Buffalo south pierhead light and curves southwest to a point on shore approximately 2,650 feet southerly. The north end of the dike is marked by a light.

The dumping ground extends about ½ mile out from the shoreline for a length of about one mile in the Lake Erie area west of the Bethlehem Steel Corp. plant at Lackawanna. A least depth of 6 feet was reported in May 1977.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. An intake pipeline of the Erie County Water Authority commences from a point on the shoreline 13,200 feet 166° from South Buffalo North Side Light, and extends 4,400 feet 267° to a crib in about 17 feet of water. The crib is not marked.

About 3¼ miles southerly of Stony Point the coast assumes the general trend of southwesterly, which, with some southerly recessions and slight irregularities, continues to longitude 82°30′, about 3 miles east of Huron, Ohio, the most southerly point on the lake. The hydrography along this entire reach is generally of a uniform character, with no shoals (except Seneca Shoal) at any great distance offshore, and the land varies from a low character to moderate bluffs of 60 to 120 feet elevation. The courses between ports are well out in deep water and there are no natural obstacles which would render navigation especially hazardous. From the bend south of Stony Point in the first stretch of 12 miles terminating at Sturgeon Point, N.Y., there are a number of submerged and exposed cribs between the shore and 3,000 feet therefrom.

Seneca Shoal, about 4 miles westerly from the east shore of the lake at the turn in trend mentioned above and about 3 miles off the adjacent southerly shore, is about ½ mile in extent north and south and east and west within the 18-foot contour. It has a least depth of 12

feet near its northerly edge, which lies 4 miles southwest from the South Buffalo Pierhead Light. The shoal is marked on its northwest edge by a lighted buoy.

Outfall Sewer.—A submerged sewer outfall, located about 4 miles south of the South Entrance to Buffalo Harbor, at the foot of North Shore Drive, Town of Hamburg, N.Y., extends 1,500 feet lakeward from the shore. The pipeline terminates in a submerged crib with a least depth of 8.5 feet over the crib which is not marked.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. Potable water intake cribs, each having about two feet over the top of the crib, are located about 6½ and 7⅛ miles southwesterly from Buffalo South entrance light. The northerly crib, marked with a buoy by the Wanakah Water Company, is 800 feet offshore from the mouth of the creek at Wanakah, in the town of Hamburg, N.Y. The southerly crib, unmarked, is 140 feet offshore, about ⅝ mile southwest of the former.

An intake crib of the Erie County Water Authority is located just east of Sturgeon Point. From a point on shore 2,350 feet 072° from Sturgeon Point, the intake pipeline extends 2,600 feet 315° to the crib in about 31 feet of water. There is a depth of 24 feet over the crib and it is not marked.

Coast Chart 14823.—Between **Sturgeon Point** and **Silver Creek**, the distance is about 12 miles and the trend continues southwesterly and the hydrography is less regular. Westerly off **Big Sister Creek**, about 2 miles from **Sturgeon Point**, is an unmarked boulder shoal having a least depth of 3 feet and with its outer edge 2 miles out.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The village of Angola, N.Y., submerged water intake crib at the end of a pipeline, is located about 2⅝ miles 203° from Sturgeon Point, or approximately 3,800 feet south of the outlet of Big Sister Creek, and 1,000 feet offshore. The crib is in about 4 feet of water and is not marked.

Wreck.—A small **hydraulic dredge** lies sunk in about 30 feet of water about 1½ miles west of Delaware Creek, approximately 3½ miles 219° from Sturgeon Point. There is 21.8 feet depth over the wreck and it is not marked.

A light, mounted on a black pole, marks the southwest side of the entrance to **Cattaraugus Creek**, about 12 miles east of Dunkirk. A straight, narrow, privately marked channel leads into the creek. In June 1977, it was reported that the creek offers good protection from all but strong southwesterly winds. It was also reported that the controlling depth varies from 2½ feet to 5 feet, depending on the shifting shoals. Local knowledge is advised.

Between Cattaraugus Creek and Silver Creek, a stony bank extends one mile from shore. From Silver Creek, the coast runs generally southwesterly to Dunkirk, distant about 10 miles, and the extent of shoal water is about ¾ mile.

Abandoned Water Intake.—An abandoned intake crib of the village of Silver Creek, N.Y., is located about 150 feet offshore in less than 6 feet of water, about 1,600 feet northwest of the mouth of Silver Creek. It is not marked.

Wreck.—An old **tug boiler** is located about 3 miles southwest of Silver Creek and 6½ miles northeast of Dunkirk, about 200 feet from shore; it projects about 2 feet above the water and is a menace only to small boats.

Dunkirk Harbor, N.Y.—This harbor is located about 37 miles by water southwesterly from Buffalo, in an indentation of the shore between **Battery Point** on the east and **Point Gratiot** on the west. These two points are about 9,600 feet apart, and the indentation within the line of the headlands is about 3,600 feet.

Channels.—The harbor is entered from Lake Erie through a dredged entrance channel northeast of Point Gratiot. The channel leads southeasterly between a pier on the west and a detached breakwater on the east to the harbor basin off the city dock. In June 1978, the controlling depths were 10 feet from deep water in the lake through the entrance channel to the city dock except for shoaling along the edges, a shoal with a least depth of 6 feet extending from the west channel limit to the channel centerline in the vicinity of Dunkirk Pierhead Light, and a shoal with a least depth of 4½ feet about 200 feet northwest of the city dock. Eastward of the city dock, the channel had a controlling depth of 4 feet.

A dredged area, formerly a Naval Militia berthing area, is on the west side of the city dock. In January 1976, an 8-foot depth was reported from the end of the dock to 100 feet shoreward. Depths in the harbor area adjacent to the dredged sections vary from 1 to 9 feet.

Aids to Navigation.—Dunkirk Pierhead Light, 63 feet above the lake on a white skeleton tower, is situated on the outer end of the west pier. Dunkirk Light, 82 feet above the lake, is located on a square stone tower attached to a dwelling at Point Gratiot. Dunkirk Harbor Light 3, 20 feet above the lake, is located on the northwesterly end of the detached breakwater.

The channel through the inner harbor is marked along its northerly and southerly edges by buoys.

A rock shoal on the west side of the entrance channel is marked by a lighted buoy located 1,850 feet 307° from Dunkirk Pierhead Light.

Harbor Facilities.—Boats entering the harbor should hold to eastward to avoid the shoals along the southwesterly side of the channel. On account of the rock bottom, there is poor anchorage in the harbor and the shallow water does not permit mooring to the breakwater. Gasoline is available at dockside pumps in the harbor and pumping facilities for marine toilets are at the Dunkirk Yacht Club. As there is no breakwater protection on the east, the harbor is exposed to severe wave action during easterly storms.

Rock Dike.—A submerged rock dike is in the harbor area west of and about in line with the northerly end of the city dock. The easterly end of the dike is about 500 feet from the west face of the city dock and extends about 750 feet westerly in a Z pattern to protect the Dunkirk Yacht Club mooring area, about 1,200 feet west of the city dock, from the northeast storms. A 1,000-foot-long floating breakwater parallels the dike about 5 feet to the south. The breakwater and dike are marked by buoys.

Outfall Pipeline.—On the easterly side of the City of

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Dunkirk, coming up to Battery Point, an abandoned pipeline extends about 1,400 feet 299° from the shore opposite the Waste Water Treatment Plant. The pipeline outlet is not marked.

A sewer outfall pipeline commences at the shoreline approximately 6,300 feet easterly of the Dunkirk Pierhead Light, and extends about 2,110 feet 318° to the outlet in 12 feet of water. There is 11 feet over the outlet and it is not marked.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A submerged intake pipe of the city of Dunkirk, N.Y., extends lakeward from the easterly side of Point Gratiot, terminating at a crib with 22 feet of water over it, and located about 1,200 feet northerly from Dunkirk Light. This crib is not marked.

Dumping Ground.—The south edge of a dumping ground area is located 4,000 feet north of the Dunkirk Pierhead Light. The dumping area is east of the recommended vessel course into the harbor, is about ½ mile square, and is to be held to a least depth of 35 feet. It is not marked.

The **Dunkirk Public Dock** at the foot of Central Avenue, in June 1977, was reported by the **harbormaster** to be in an unsafe condition and no longer used by commercial vessels to load or unload cargo. Persons desiring to do so, however, should contact the harbormaster or the City Engineer for additional information. The dock is now used as a fishing pier for commercial and sports fishermen and has water and electricity available for transient pleasure craft. However, transient pleasure craft should use the facilities of the Dunkirk Yacht Club for a fee.

Between Gratiot Point and **Van Buren Point,** 4⅛ miles southwest, there is a rocky bank with less than 20 feet of water, extending out one mile from the shore about 1¼ miles from the Van Buren Point. From Van Buren Point the coast has a general direction of southwest for about 13 miles to Chautauqua Creek, and is clear to within ⅝ miles or less.

Wreck.—The wreck of a sunken sailing **ketch** is located about 2⅞ miles 230° from Dunkirk Light.

Barcelona, N.Y.—Near the mouth of Chautauqua Creek, this harbor is located about 17 miles by water southwesterly from Dunkirk and is a harbor of refuge for light-draft vessels. A large white building with a red roof, located on the west side of the harbor entrance, is a prominent landmark.

Channels.—The harbor is entered from Lake Erie through a dredged entrance channel between two converging breakwaters to a harbor basin just inside. In August 1978, the controlling depths were 8 feet in the entrance channel with 3 to 4 feet in the basin.

Aids to Navigation.—Barcelona Harbor East Breakwater Light is exhibited 26 feet above the lake from a white steel column on the outer end of the east breakwater. Barcelona Harbor West Breakwater Light is exhibited 26 feet above the lake from a white steel column on the outer end of the west breakwater.

Harbor Facilities.—A channel about 100 feet wide leads from the inner end of the harbor basin to the west side of the public wharf near its northerly end. Soundings reported in June 1977 indicated controlling depths of 4 feet in the channel and along about 200 feet of the west face of the public wharf, commencing at the northwest corner. Gasoline at dockside pumps and limited repair facilities are available on the westerly side of the harbor.

Fishing and Hunting Regulations.—See § 206.80 of Rules and Regulations preceding.

Erie Harbor is about 28 miles southwesterly from Barcelona and the intermediate shore has no shoals beyond a distance of ½ mile. The New York-Pennsylvania State line is about 10 miles from the Barcelona Breakwater Lights.

Wreck.—An exposed wreck is located about 7½ miles 237° from Barcelona West Breakwater Light. It is about 700 feet offshore in about 6 feet of water and is not marked.

Coast Chart 14824.—About 3½ miles east of Erie are two exposed concrete and steel cribs with 15 feet depth along their westerly sides and having pipelines extending 2,000 feet to oil storage facilities on the shore. The outer crib is marked by a light.

Wreck.—The wreck of a sunken steamer, located about ⅜ mile offshore in about 8 feet of water, about ¼ mile west of the oil dock, or about 3 miles easterly of Erie Harbor, has broken up and is no longer visible above the surface.

Charts 14824, 14835.—Presque Isle Peninsula is an irregularly shaped body, rounding on its lakeward side, connected with the mainland only by a narrow neck at the west end and broadening toward the east, forming the nearly land-locked harbor of Erie with entrance from the east. There are no major shipping facilities on the peninsula. The small boat facilities are on the south side and described generally in their relationship to Presque Isle Bay. Presque Isle Light is on the lake face about 1½ miles west of the peninsula's more northerly point.

Existing shore protection structures are located on the lakeward side of the peninsula in the reach extending from a point approximately 3,400 feet east of the Presque Isle Light westerly to a point about 1,500 feet west of route 832 extended, generally in the vicinity of the neck of the peninsula. The structures are generally normal to the shore line except in a few instances where they are parallel to the shore line. Timber piling, steel sheet piling, stone and H beams were used in the construction. All or part of the structures are submerged at various water stages. Operators of small craft are cautioned not to approach within 500 feet of the shoreline in the above area.

Erie Harbor, Pa.—This harbor is located in **Presque Isle Bay,** inclosed from the lake by Presque Isle Peninsula, distant about 78 miles by water southwesterly from Buffalo Harbor. The peninsula is now a state park, known as Presque Isle State Park. The bay opens to the east and is about 4½ miles long parallel to shore and about 1½ miles in maximum width. The harbor area of the bay, 15 feet or more in depth, is about 2 miles long and from ½ to 1½ miles wide.

Channels.—A Federal project provides for a dredged

entrance channel leading southwestward from deep water in Lake Erie between two parallel piers to a harbor basin and three adjacent turning basins in Presque Isle Bay. The Federal project depths are 29 feet in the entrance channel, 28 feet in the harbor basin, 27 feet in Approach Turning Basin, 21 feet in Erie Turning Basin, and 18 feet in Harbor Turning Basin. (See Local Notice to Mariners and latest edition of charts for controlling depths.)

An approach channel marked by buoys leads southwest from the harbor basin to a turning basin off the piers on the south side of the bay about 2.6 miles southwest of Erie Harbor Pierhead Light. The channel and turning basin are not maintained.

Aids to Navigation.—Erie Harbor Pierhead Light is near the east end of the north pier; an air diaphragm foghorn and a radiobeacon are operated as required. Range lights, on skeleton towers with white daymarks mark the centerline of the outer entrance channel; the front light is 1,300 feet from the outer end of the south pier and the rear light is near the inner end of the south pier, 755 feet 235° from the front light. The outer channel is well marked with buoys.

Erie Harbor Inner Range Lights form a stern range leading through the inner part of the channel into the basin; the front light is on the west end of the north pier and the rear light is 835 feet 054½° from the front light. At the inner end of the channel, buoys mark the flared entrance into the basin.

Harbor Facilities.—On the city of Erie waterfront, two canal basins with controlling depths of 5 feet, located adjacent to and on each side of the foot of State Street, are owned by the city of Erie and are under the supervision of the port commissioner. There are numerous dock facilities and three privately owned marine railways, two in the west basin and one in the east basin. Marine fuel, at dockside pumps, mobile hoists up to 75,000 pounds capacity, supplies, and service are available at several places in the vicinity of the basins and in the westerly part of the bay.

A small boat basin has been constructed off the north side of the bay in Presque Isle State Park being roughly ½ by ¼ mile in size and with an available depth of 8 feet, and a least depth of 6 feet. The dredged entrance channel, about 1¾ miles west of the Erie Harbor entrance, is marked by privately maintained lights, and a 339¾° privately maintained lighted range. Soundings in 1973 indicated a controlling depth of 9 feet on the centerline of the entrance.

Obstruction.—An obstruction which would be exposed at low water datum, is located on the south edge of the entrance to Horse Shoe Pond east of Misery Bay, 1,600 feet 068° from Perry Monument at Presque Isle State Park.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Erie, Pa., is contained in the **Port Series No. 42** (Revised 1970) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Port Commission, City of Erie.—This agency has filled and developed an area in the eastern portion of the harbor. The Erie International Marine Terminal Pier, 1,500 feet long, is close south of the entrance channel. A 300-ton dockside cargo crane is available. The pier and area are serviced by a highway and a railroad spur.

Graving Dock and Shipyard.—Erie Marine, Inc. (Div. of Litton Ind.) developed and maintains this facility south of the 28-foot harbor area. The graving dock, 1,250 feet in length with width of 140 feet and floating gate, is located on the east side of the property. A fitting and repair slip on the west side of the property is 1,120 feet long; the outer 570 feet was dredged in 1959 to a depth of 27 feet for a width of 130 feet adjacent to the pier. The approach channel is about 800 feet wide at its junction with the 28-foot harbor area, thence narrowing to about 130 feet at the entrance to this slip. There is an available depth of 27 feet within the Federal project in the approach channel to this slip.

Acceptable Vessel Watering Points.—See indexed item "Acceptable Vessel Watering Points" for page reference to complete listing.

Coast Guard Station.—Erie Coast Guard Station is located on the north side of the entrance, near the Erie Harbor Inner Range Rear Light.

National Weather Service Warning Display Station.—Signals are displayed from a steel tower about 8.7 miles southwest of Presque Isle, at the entrance to Walnut Creek about 1,500 feet east of the breakwater light.

Outfall Pipeline.—A 39-inch sewer pipeline of the Hammermill Paper Co. commences on the shoreline 5,500 feet 122° from the Erie Harbor Pierhead Light and extends 3,600 feet 013° to the end in about 20 feet of water. There is no crib at the end of the pipeline.

Water Intakes.—A 48-inch intake pipeline of the Hammermill Paper Co. extends from a point on the shoreline 5,180 feet 133° from the Erie Harbor Pierhead Light, 1,890 feet 351° to their East Crib in about 10 feet of water. The crib is marked with a light.

A second pipeline of the Hammermill Paper Co. extends along the westerly side of the East Crib line. The pipeline commences on the shore 5,180 feet 134° from the Erie Harbor Pierhead Light and runs 1,900 feet 350° to an unmarked exposed crib located about 125 feet west of the East Crib.

An exposed crib is located about 200 feet offshore from the shore end of the pipelines, about 100 feet west of the lines.

Oil Pipelines.—There are 3 six inch oil pipelines extending from the shoreline south of the harbor entrance to the Gulf Oil Corp. wharf cribs in about 12 feet of water. The lines start from a point on the shoreline 4,800 feet 155° from the Pierhead Light and extend 2,600 feet 333° to a turn, then 1,450 feet 294° to the wharf east crib. The line and wharf are not marked.

Submerged Pier.—To the west of the oil pipelines, there is a submerged pier about 100 feet wide. The pier extends from a point on the shoreline 4,600 feet 158° from the Pierhead Light for a distance of 2,200 feet on a bearing of 334°. There is a depth of 1 to 2 feet over the pier and it is not marked.

Intake Crib.—An intake pipeline extends 275 feet 000° to an exposed intake crib in about 5 feet of water in the area adjacent to the west side of the submerged pier. It is not marked.

Submerged Crib.—A submerged crib is located 3,200 feet 187° from the Pierhead Light in the area west of the submerged pier. It is in about 7 feet of water, with a depth of about one foot over the crib and is not marked.

Outfall Sewer.—A 72 inch outfall sewer extends from a point on shore 3,400 feet 198° from the Pierhead Light, 420 feet 027° to a turn, 2,400 feet 065° to a second turn, 6,400 feet 051° to the outlets in about 24 feet of water. It is not marked.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A 60 inch potable water intake pipeline of the city of Erie commences at the breakwater of the Waterworks Pumping Station 11,000 feet 221° from the Pierhead Light, and extends northwesterly into Lake Erie. The pipeline runs from the breakwater face 850 feet 335° to a turn, then on a straight line about 3⅛ miles 299° under the Presque Isle Peninsula to an unmarked intake crib in about 28 feet of water. There is a depth of 22 feet over the outer crib. Along the pipeline, 6,900 feet from the turn in about 19 feet of water, there is an intermediate submerged crib on the line, having a depth of 11 feet over the crib and marked with a buoy. Buoys also mark the turn and the mid-point of the line crossing the harbor.

Wreck.—There is a submerged wreck in the harbor area west of the most westerly railroad dock facility. The wreck is 800 feet from the shore on a line of Raspberry Street, extended, and is in about 10 feet of water.

Pipeline.—About 1,000 feet west of the most westerly railroad dock, a pipeline extends about 500 feet in a northerly direction from the shore into about 2 feet of water. About 125 feet from shore, and 50 feet east of the pipeline, there is an exposed crib. About 150 feet northwesterly from the outer end of the pipeline is a second crib. The cribs and pipeline are not marked.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A 72 inch water intake pipeline of the city of Erie, Pa., is located in the very southwesterly shallows of Erie Harbor. The line commences on the shoreline opposite the City Waterworks Road, extended. It extends 8,650 feet 310° from the shore, across the harbor, under the "Presque Isle Neck" and into Lake Erie to a crib in about 26 feet of water. There is 22 feet of water over the crib and it is not marked.

Fishing and Hunting Regulations.—See 33 CFR § 206.80 of Rules and Regulations, preceding.

Local Harbor Regulations are established by the Erie-Western Pennsylvania Port Authority and enforced by the **harbormaster** who may be reached at the Municipal Building. A **speed limit** of 3 m.p.h. is enforced in the East and West Canal Basins and within 300 feet of the shoreline. A speed limit of 5 m.p.h. is enforced elsewhere in the harbor. Copies of the regulations may be obtained from the Port Authority Office, 507 Municipal Building, Erie, Pennsylvania 16501.

Section II.—South Shore from Erie, Pa. to Cleveland, Ohio

Chart 14824.—From the neck of Presque Isle Peninsula to Conneaut Harbor the direction is about southwesterly, the distance about 22½ miles, and the water clear outside of ½ mile.

Water Intake.—An abandoned water intake pipeline is located about 3⅜ miles northeasterly from the Pennsylvania-Ohio State line. The pipeline extends about 600 feet 310° from the shoreline in about 5 feet of water. The pipeline is not marked.

The Pennsylvania-Ohio State line is about 1½ miles east of the Conneaut piers.

Conneaut Harbor, Ohio.—This port is located about 107 miles southwesterly of Buffalo, or about 73 miles northeasterly from Cleveland; it comprises an outer harbor sheltered by breakwaters, and an inner harbor formed by the lower 3,000 feet of the Conneaut River, including a slip built by the Pittsburgh & Conneaut Dock Co.

Channels.—The harbor is entered from natural deep water in Lake Erie between converging breakwaters to a dredged basin inside the breakwaters. A dredged channel leads from the southeast corner of the basin upstream in Conneaut River for about 0.4 mile to the wharves on either side of the river. A dredged channel leads south from the southwest part of the basin to the municipal pier about 0.4 mile southwest of the mouth of the river. In April 1978, the controlling depths were 26 feet in the eastern part of the basin except for shoaling along the edges and 19 feet in the western part of the basin except for shoaling along the west limit, thence 26 feet in the river channel.

A privately dredged turning basin in the river immediately above the limit of the Federal project had a controlling depth of 24 feet in 1977 except for shoaling along the edges. A private slip extending south from the turning basin has a least depth of 19 feet near the south end.

Aids to Navigation.—West Breakwater Light, 80 feet above water on a white square pyramidal tower with black band, is located on the new pierhead at the outer end of the west breakwater; a fog diaphragm horn sounds as required.

Breakwater Light 1 is located on the outer end of the east breakwater.

The piers at the river entrance are marked with Pier Light 4 on the outer end of the west pier and Pier Light 3 on the outer end of the east pier.

East Gap Light is located on the northerly end of the shoreward extension of the east breakwater to mark the south side of the gap in the east breakwater.

Harbor Facilities.—The Pittsburgh & Conneaut Dock Co. operates ore unloaders along the dock on the easterly side of the river, equipment for handling steel products on the westerly side of the river, and coal loading equipment on the easterly side of the slip.

Structures Across Conneaut Harbor

No.	Location and name	Kind	Miles above West Breakwater Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Inner Harbor								
1	Aerial cable	Electric	1.15	-------	-------	-------	124.0	-------	
	Conneaut River								
2	Bessemer and Lake Erie RR. bridge.	Railroad	1.20	-------	-------	-------	-------	-------	Swing. Inoperative.
	Slip								
3	Aerial cable	Electric	1.17	-------	-------	-------	122.0	-------	

A small boat channel, 200 feet in width, dredged in 1963 to a depth of 8 feet extends from the 8 foot contour in the west harbor, commencing at a point about 1,400 feet west of the West Pier Light to about midpoint of the Municipal Pier. In addition, a channel along the face of and parallel to the pier, 150 feet wide extends about 150 feet west of the westerly end and about 350 feet east of the easterly end. In June 1977, a controlling depth of 4 feet was reported in the channel.

The Conneaut Port Authority operates a small-boat basin about 0.2 mile northeast of the Municipal Pier. The entrance is marked by private lights and a private lighted range. In June 1977, the controlling depth in the entrance was reported to be 5 feet with 3 to 18 feet reported alongside the berths.

A continuing shoaling west of the previously mentioned small boat channel deters the use of the West Harbor Gap. Entering through this gap should be avoided unless familiar with current harbor conditions.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Conneaut, Ohio, is contained in the Port Series No. 42 (Revised 1970) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline of the city of Conneaut, Ohio, is located west of the west breakwater at Conneaut. The pipeline commences at a point on the shoreline 8,800 feet 212° from the West Breakwater Light, and extends 2,000 feet 338° to an intake crib in about 20 feet of water. There is a depth of 14 feet of water over the crib and it is not marked.

Navigation Regulations.—See 33 CFR § 162.165 and § 207.570 of Rules and Regulations, preceding.

From Conneaut to Ashtabula, Ohio, 13½ miles southwesterly the offshore water is deep at ½ mile out.

Fishing and Hunting Regulations.—See 33 CFR § 206.80 of Rules and Regulations, preceding.

Chart 14825.—Wrecks.—The wrecks of the barge **Dixie** and launch **Surveyor**, which sank on 4 December 1964, lie in 43 feet of water 20,000 feet 066° from Ashtabula Harbor East Breakwater Light. There is an available depth of 35.6 feet over the wrecks.

Charts 14825, 14836.—Ashtabula Harbor, Ohio.—This port is located about 119 miles southwesterly from Buffalo or about 59 miles northeasterly from Cleveland. It comprises an outer harbor and the navigable portion of the **Ashtabula River**, a length of about 10,500 feet above the entrance, and two large slips opening directly into the lake under the protection of the breakwaters.

Channels.—The harbor is entered from Lake Erie through a dredged entrance channel between converging breakwaters. Inside the breakwaters, the outer harbor divides into eastern and western channels with a central turning basin. The western channel leads along the west breakwater and around the west end of an inner detached breakwater to the mouth of the ConRail Minnesota Slip and to the mouth of the Ashtabula River and thence upstream for about 2 miles. The eastern channel leads southeastward to a basin off the entrance to two large slips. There is a triangular turning basin between the two outer channels on the north side of the inner detached breakwater.

In June 1978, the midchannel controlling depths were 27 feet from the breakwater entrance through the western channel to a point abreast the inner breakwater, thence

26 feet to the mouth of the river and the mouth of the ConRail Minnesota Slip except for shoaling along the edges and shoaling to 20 feet at the eastern limit, thence 25 feet for about 0.4 mile in the river channel, thence 17 feet to the Fifth Street bridge, thence in 1977, 15 feet to the Ashtabula Yacht Club, thence 10 feet to a point about 800 feet downstream of the ConRail bridge, thence 3 feet to the upstream limit of the Federal project with 2 to 3 feet in the turning basin just below the limit of the project. In June 1978, the midchannel controlling depth in the eastern channel and basin was 27 feet with 21 feet in the triangular turning basin.

Aids to Navigation.—Ashtabula West Pierhead Light is located on the west breakwater pierhead at the outer entrance. Ashtabula Light is located on the west breakwater 600 feet 209½° from West Pierhead Light; an air fog diaphragm horn and a radiobeacon are operated at this station.

East Breakwater Light is on the east pierhead at the outer entrance. East Breakwater South End Light marks the east end of the east breakwater.

Inner Breakwater Light is near the west end of the inner breakwater. West Pier Light is on the west side of the inner entrance.

A light is maintained by the Cleveland Electric Illuminating Co. on the north end of the power-house breakwater, 1,500 feet from shore, distant 6,500 feet 116½° from East Breakwater Light.

A buoy marks the channelward edge of a shoal at the outer end of the ConRail dock.

Harbor Facilities.—ConRail has docks on both sides of the river mouth in addition to a slip opening into the outer harbor located about 1,000 feet east of the river mouth. The easterly portion of the outer harbor has been developed for docks and two private slips by the Pinney Dock and Transport Co. Additional facilities for commercial and small craft are available upstream in the Ashtabula River from the vicinity of the first turn to the limit of the Federal Project.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Ashtabula, Ohio is contained in the Port Series No. 42 (Revised 1970) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Coast Guard Station.—Ashtabula Coast Guard Station is located on the east side of the river about 700 feet north of the highway bridge.

Structures Across the Ashtabula River

No.	Location and name	Kind	Miles above West Pierhead Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Ashtabula River	Junction	0.65						
1A	Overhead conveyor		1.23				100.0		
2	Submerged cable		1.37						Approx. depth 25.7 ft.
3	Fifth Street bridge	Highway	1.38			139.0	11.2		See note 1.
4	Submerged cable		1.39						Approx. depth 23.7 ft.
5	do		1.40						Approx. depth 27.2 ft.
6	Submerged pipeline	Water	1.40						Approx. depth 27.2 ft.
7	do		1.48						Approx. depth 27.7 ft.
8	do	Sewer	1.48						Approx. depth 27.6 ft.
9	do	Water	1.52						Approx. depth 27.7 ft.
10	Aerial cable		2.22				131.0		
11	ConRail bridge	Railroad	2.23			112.0	11.5		See notes 1 and 2.
12	Submerged cable		2.23						Approx. depth 26 ft.
	Turning basin	Junction	2.27						

NOTE: 1. Bascule bridge—The signal from commercial or emergency vessels only vessel to the bridgetender to open the draw is three long blasts of whistle (— — —). Signals from the bridge in response are as follows: One long blast, "come ahead"; five blasts, "stop—bridge cannot be opened." Bridge is opened on the hour and half hour for all other floating craft. See preceding 33 C.F.R. § 117.706a.

NOTE: 2. The bridge is marked by a fixed red light on each abutment, and by a swinging light on the south end of the bridge showing red when bridge is closed and green when opened.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The submerged water intake crib of the Union Carbide Metals Co. is located about 1½ miles easterly from Ashtabula Harbor East Breakwater Light. The pipeline starts on the shore at a point 9,600 feet 108° from the West Pierhead Light, and extends about 4,000 feet 346° to a crib in about 26 feet of water. There is a depth of 21 feet of water over the crib and it is not marked.

Outfall Sewer.—A submerged 42 inch concrete outfall sewer extends northeasterly from the east side of Pinney Dock No. 4. The pipeline starts at a point 5,370 feet 142° from the West Pierhead Light, and extends 3,000 feet 027° to the outfall in about 10 feet of water. There are no markers on this pipeline.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding, and 33 C.F.R. § 117.706a of Rules and Regulations, preceding.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. Two water intake pipelines of the city of Ashtabula, Ohio, are located on the northwesterly side of the city of Ashtabula, extending from the shoreline in the vicinity of the waterworks, into Lake Erie.

The northerly 30-inch intake pipeline commences at a point on the west breakwater 6,630 feet 210° from the West Pierhead Light, and extends 1,760 feet 326° to dual intake cribs in about 23 feet of water. The depth of water over the cribs is 20 feet and they are not marked.

The southerly 24-inch intake pipeline commences at a point on the West Breakwater 6,730 feet 210° from the West Pierhead Light, and extends 1,625 feet 326° to an intake crib in about 22 feet of water. There is a depth of 18 feet over the crib and it is not marked.

Fishing and Hunting Regulations.—See § 206.80 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.165 and § 207.570 of Rules and Regulations, preceding.

Local Harbor Regulations are established by the City Council and enforced by the **harbormaster** who may be reached at the Port Authority Office. A **speed limit** of 6 m.p.h. is enforced in the harbor for vessels greater than 100 feet in length. Copies of the regulations may be obtained from Port Authority Office, 529 Prospect Road, Ashtabula, Ohio 44004.

* * * * *

Bridge Regulations

147.32 Blowing of Whistles on Vessels.

The Fifth Street County Highway Bridge, 3,250 feet above the West Pier Light at the outer end of the ConRail Dock, is at a right-angle bend of the river; it is a bascule bridge with vertical clearance of 11.2 feet above low-water datum when closed and width of 139 feet between fenders. The signal from the vessel to the bridge tender to open the draw is one (1) long blast of whistle (——). Signals from the bridge in response are as follows: one (1) long blast, "come ahead"; two (2) blasts, "stop engine"; three (3) blasts, "slow down."

The ConRail Bascule Bridge is 7,650 feet above the West Pier Light at the outer end of the ConRail dock; it has headroom (when closed) of 11.5 feet and clear opening of 112 feet. The signal from the vessel to the bridge tender for opening is one (1) long, and (1) short, one (1) long whistle (— — — —); if bridge can be opened, tender answers by same signal. An electric horn on the bridge sounds three (3) short blasts (— — —) as a signal for the vessel to check, and two (2) short blasts (— —) if the draw cannot be opened; these signals should be repeated by the vessel. The bridge is marked by a fixed red light on each abutment, and by a swinging light on the south end of the bridge showing red when bridge is closed and green when open.

Any violation of or failure to comply with any of the provisions of this section, shall be punished by a fine of not less than ten dollars ($10.00) for the first offense, and not to exceed fifty dollars ($50.00); and for any second or subsequent offense not less than fifty dollars ($50.00), nor more than five hundred dollars ($500.00).

Nothing in this section shall be construed as forbidding the use of horn or whistles as alarm signals in case of fire or collision, or other imminent danger, or the necessary signals required in the operation of vessels.

147.33 Bridge Signals.

(1) If for any reason the bridge operator will be temporarily delayed in opening such bridge, he shall blow a check signal of three (3) short blasts.

(2) If for any reason the bridge operator cannot open such bridge in response to proper signals so to do, he shall blow a warning or danger signal from the bridge whistle of five (5) or more short blasts.

147.34 Vessels Approaching Bridges.

It shall be unlawful for any master or person in charge or in possession of any vessel navigating the harbor to approach any nearer to any of the bridges than to a point at a distance from such bridge within which such vessel can be stopped without colliding with such bridge, unless he has received the approval signal of one (1) long and one (1) short blast.

147.35 Bridges To Be Lighted.

All bridges over the Ashtabula River in the City of Ashtabula shall be lighted in accordance with the regulations of the United States Coast Guard, and lights shall be visible on a dark night with clear atmosphere at least one (1) nautical mile or about 2,000 yards.

147.36 Vessels Passing Through Bridges.

All vessels navigating the harbor when passing any bridge shall be moved as expeditiously as is consistent with a proper movement in the river, and shall not be anchored or fastened to interfere with the opening or closing of any bridge.

147.37 One Vessel Tow.

It shall be unlawful for any person to cause any vessel to tow more than one vessel at a time through any movable bridge in the harbor, providing that this shall not be construed as applying to scows or yachts.

147.38 Passing on After Signal To Come.

When any bridge operator shall be about to open the span of any bridge within the limits of the City, he shall give notice to land traffic of his intention to open such movable span by raising a flag, ringing a bell or other signal, or flashing a red light. After such notice is given, no person shall walk, ride or drive any vehicle upon such movable span while such bridge operator is opening or closing the same.

147.39. Standing on Movable Span While Opening or Closing.

It shall be unlawful for any unauthorized person or persons to stand or remain on any movable span in the harbor when the same is being opened or closed.

147.40 Lounging on Bridge, etc.

It shall be unlawful for any person or persons to assemble upon or about any of the bridges, and then and there lounge or loiter, and conduct himself, herself or themselves in a manner annoying to persons passing by, or to the distress of any other person or persons whatsoever, or to commit any indecent or disorderly act while stopping upon or about said bridges.

147.41 Duty of Bridge Operators.

It shall be the duty of the bridge operator in all cases to report to his immediate superior and the Harbor Master any infraction of this article.

147.42 Penalty for Violation.

Any master, owner or person in possession, charge or control of any vessel, or any other person, firm or corporation who shall violate any of the provisions of this article shall be fined not less than fifty dollars ($50.00) nor more than five hundred dollars ($500.00).

* * * * *

Chart 14825.—Between Ashtabula and Fairport, Ohio, about 30 miles southwesterly, the shallow bank bordering the shore is about ⅝-mile in greatest width.

Submerged Pipeline.—About 9½ miles southwest of Ashtabula, just west of Geneva-on-the-Lake, a submerged intake pipeline commences at the shoreline on a line with Route 534, extended, and runs about 1,200 feet 001° to a crib in about 7 feet of water. There is a depth of 6 feet over the crib and it is not marked.

Wreck.—The wreck of a vessel with a least depth of 10 feet over it, is reported to lie about ⅝ mile off-shore at a point about halfway between Ashtabula and Fairport, and northwest of Madison-on-the-Lake.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A submerged water intake of Lake County is located approximately 15⅝ miles from Ashtabula Light or about 11⅝ miles from Fairport East Breakwater Light. The intake pipeline commences at the shore and extends 2,000 feet 334° to a crib in about 16 feet of water. There is a depth of 15.6 feet over the crib and it is not marked.

Sewer Outfall.—A sewer outfall pipeline of the I.R.C. Fibers Co., a subsidiary of Cyanamid, commences at a point on the shoreline 21,600 feet 079° from Fairport East Breakwater Light and extends 500 feet 230° to a crib in about 4 feet of water. The crib is marked by a buoy.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline of the I.R.C. Fibers Co., a subsidiary of Cyanamid, commences at a point on the shoreline 20,600 feet 080° from Fairport East Breakwater Light, and extends 4,000 feet 328° to a crib in about 21 feet of water. There is a depth of 18 feet over the crib and it is marked by a lighted buoy.

Water Intake.—A submerged water intake of the I.R.C. Fibers Co., a subsidiary of Cyanamid, commences at a point on shore 20,000 feet 081° from Fairport East Breakwater Light, and extends 1,900 feet 315° to about 14 feet of water. There is a depth of 11 feet over the end of the pipeline and it is marked with a buoy.

Obstruction.—A boulder has been located 10,200 feet 061° from Fairport Harbor East Breakwater East End Light. The depth over is 16 feet with 19 to 24 feet surrounding. The boulder may constitute an obstacle to near-shore boaters.

Charts 14825, 14837—Fairport Harbor, Ohio.—This port is located about 30 miles southwesterly from Ashtabula or about 33 miles northeast of Cleveland Harbor; it comprises an outer harbor and an inner harbor formed by the lower 1 mile of the Grand River.

Channels.—The harbor is entered from Lake Erie through a dredged channel from deep water in the lake between two converging breakwaters to an outer harbor basin. From its inner end, the eastern breakwater turns eastward and parallels the shore for about 1 mile. From the outer harbor basin, the mouth of the river is entered between parallel piers, and the channel extends upstream for 1.5 miles. There is a turning basin on the west side of the channel about 1 mile above the mouth.

In June 1978, the controlling depths were 25 feet from deep water in the lake through the entrance channel and outer harbor basin to the mouth of the river, thence 22 feet from the mouth of the river for 0.7 mile except for shoaling along the edges, thence 17 feet to the upstream Federal project limit. The turning basin had a controlling depth of 15 feet except for shoaling to 7½ feet near the edges.

At times there is a very strong current past the pierheads making it difficult and dangerous for unaided vessels to enter the river channel.

Aids to Navigation.—East Breakwater Light is on the northwesterly end of the east pierhead. West Breakwater Extension Light is on the outer most northerly end of the west breakwater. West Breakwater Light is located about 510 feet 178° from West Breakwater Extension Light; a fog diaphragm horn and a marker radiobeacon are operated at this station. East Pier Light on the outer end of the east pier, and West Pier Light on the outer end of the west pier mark the entrance into the Grand River.

Fairport Breakwater Buoys A, B, C, D, painted white with the black lettered words "Submerged Breakwater",

are located two on either side of the easterly third of the east breakwater. The buoys mark the easterly portion of the east breakwater which may be submerged or exposed under varying conditions.

East Breakwater East End Light marks the east end of the east breakwater.

Harbor Facilities.—The east bank of the river for nearly one mile above the lake is completely occupied by private wharves.

The Morton Salt Co., Fairport Mine wharf is located on the west bank about 2,300 feet upstream from the West Pier Light. Soundings in June 1976 indicated 22 feet depth available along the dock face.

Gasoline is available at dockside pumps along the west side of the Grand River near the entrance to the harbor and also 1¼ miles upstream.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Fairport, Ohio, is contained in the Port Series No. 42 (Revised 1970) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Coast Guard Station.—Fairport Coast Guard Station is located on the west side of the mouth of the Grand River.

Submerged Power Cables.—Submerged power cables cross the western side of the outer harbor between West Pier Light, the West Breakwater Light and West Breakwater Extension Light.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A submerged 60-inch intake pipeline of the Diamond Shamrock Chem. Co., with the top buried 2 feet below the natural bottom, extends from a point on the shoreline 6,460 feet 119° from the West Breakwater Light, 3,340 feet 350° to an exposed intake crib in 17 feet of water. A lighted buoy is about 125 feet west of the crib.

Water Intakes.—An old water intake pipeline of the Diamond Shamrock Chem. Co., extends from a point on the shoreline 6,400 feet 120° from the West Breakwater Light, 650 feet 350° to an exposed Inner Crib in about 12 feet of water with only one foot of water on the north side of the crib. The crib is marked with a light mounted 15 feet above the water.

A submerged 54-inch water intake pipeline of the Diamond Shamrock Chem. Co. with the top buried 1½ feet below the natural bottom, extends from a point on the shoreline 6,375 feet 120° from the West Breakwater Light, 3,350 feet 351° to an exposed intake Outer Crib in 17 feet of water. The crib is marked with a lighted buoy.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A submerged 20-inch steel intake pipeline of the Fairport waterworks, extends from a point on the shoreline 2,745 feet 210° from the West Breakwater Light, 860 feet 302° to a crib in about 12 feet of water. There is a depth of 6 feet over the crib and it is not marked.

A submerged water intake pipeline of the city of Painesville, Ohio commences on shore 6,470 feet 220° from the West Breakwater Light. The pipeline extends 950 feet 330° to an intake crib in 10 feet of water marked by a buoy.

A submerged water intake pipeline of the city of Painesville, Ohio commences on shore 6,510 feet 220° from the West Breakwater Light. The pipeline extends 3,440 feet 329° to an intake crib in 22 feet of water. There is a depth of 14 feet over and it is not marked.

Fishing and Hunting Regulations.—See § 206.80 of Rules and Regulations preceding.

Navigation Regulations.—See 33 CFR § 162.165 and § 207.570 of Rules and Regulations, preceding.

Local Harbor Regulations are enforced by the **harbormaster** who may be reached through the Chief of Police, 220 3rd Street, Fairport Harbor, Ohio 44077. **Speed limits** of 6 m.p.h. and 10 m.p.h. are enforced in Grand River and in the outer harbor, respectively. Copies of the regulations may be obtained from Village Hall, 220 3rd Street, Fairport Harbor, Ohio 44077.

From Fairport, the coast trends southwesterly to Cleveland, the distance to the main entrance of the latter harbor being about 33 miles. The extent of shoal water along this shore is about ¾ mile near Fairport, decreasing to ½ mile or less farther southwestward, to the vicinity of the Cleveland lake front.

Wrecks.—The barge, **L. L. Lamb**, loaded with large riprap stone, foundered August 16, 1902, one mile northwesterly of Fairport East Pier Light, in 26 feet of water. In 1904 the scattered rock which formed the cargo was leveled off so as to leave a least depth of 23 feet over it.

The barge, **Cleveco**, which sank in December 1942, was partially raised in 1961 and moved to a position approximately 16⅞ miles 010½° from the Cleveland East Entrance Light, where it was sunk keel up in 71 feet of water. The least depth over the wreck is 40 feet.

Chart 14825.—**Mentor Harbor** is located about 4½ miles southwesterly from Fairport Harbor. During the yachting season local interests usually maintain a depth of 11 feet in a narrow channel close to the east breakwater. In June 1977, a depth of 8 feet was reported alongside the berths in the harbor. Two privately maintained lights, on poles with white daymarks, are maintained on the east breakwater at points 27 feet and 409 feet from the outer end with a range of lights further inland.

Sewer Outfall.—The Mentor sewer outfall pipeline commences at a point on the shoreline 1,800 feet 073° from Mentor Outer East Breakwater Light, and extends 1,960 feet 326° to a submerged crib. The depth over the crib is 13 feet, and it is not marked.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A water intake pipeline of the Ohio Water Service Co. (Mentor Township Park) commences at a point on the shoreline 3,980 feet 230° from Mentor Outer East Breakwater Light, at Mentor Harbor, and extends 2,100 feet 327° to an intake crib in about 15 feet of water. There is a depth of 13 feet over the crib and it is not marked.

Wreck.—The sunken wreck of the 81-foot tug *North*

Carolina, lost 12 December 1968, is located in 34 feet of water 1.5 miles 277° from Mentor Outer East Breakwater Light. There is a least depth of 10 feet over the mast and 16 feet over the pilot house with the wreck confirmed in an upright position in August 1974.

Chagrin River is located about 10 miles west of **Fairport** Harbor. The channel through the mouth varies from 100 to 150 feet in width. In 1976, the controlling depth was 1 foot, except for shoaling to bare on the east side about 200 feet inside the entrance. The river entrance is marked by private seasonal lights on the west bank.

Sewer Outfall.—A submerged sewer outfall is located approximately 1,000 feet west of the **Chagrin River** at Eastlake, Ohio, and extends 2,600 feet northwesterly from the shore. The end of the pipeline is not marked.

Water Intake.—About 2,500 feet west of the mouth of the Chagrin River, a breakwater which forms an intake for Cleveland Electric Illuminating Co., extends about 1,200 feet from shore and is marked on the outer end by a light 18 feet above the water.

Charts 14825, 14826.—Water Intake.—The Upson Water Co.'s intake, marked by a buoy, is located opposite East 250th Street and about 9¼ miles 051° from Cleveland East Entrance Light. The intake pipeline terminates in a submerged crib, 2,100 feet from shore, with 14 feet over the crib.

Chart 14826.—Outfall Sewers.—The city of Euclid storm sewer outfall pipeline, located at the foot of East 232nd Street, at Moss Point, extends about 320 feet into the lake with an authorized depth of 4.7 feet at the outer end, which is not marked. The city of Euclid outfall sewers, located opposite East 222nd Street at Moss Point, approximately 8 miles 051° from Cleveland East Entrance Light, extend 1,335 feet 325° into the lake with a least depth of 13 feet at the outer end.

The Wildwood Yacht Club harbor is located about 5½ miles 054° from Cleveland East Entrance Light, close northeast of Euclid Creek. The boat entrance is marked by private seasonal lights on the end of the east pierhead and on the end of the west pierhead. In June 1977, the controlling depth in the entrance was reported to be 7 feet, with 7 to 11 feet reported in the harbor.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, proceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A water intake pipeline of the City of Cleveland, Nottingham plant, starts at a point on the shoreline 9⅝ miles 056° from the West Pierhead Light and extends 18,600 feet 308° to an intake crib in about 48 feet of water. There is a depth of 40 feet over the crib and it is not marked.

The Northeast Yacht Club Basin is located adjacent to the Cleveland sewage disposal plant, about 4 miles northeasterly from the Cleveland East Entrance Light. The entrance is marked by private seasonal lights on the easterly end of the north breakwater and the north end of the east breakwater. In June 1977, the controlling depth was reported to be 6 feet in the entrance and in the basin.

About 3.1 miles southwest of **Euclid Creek**, at the mouth of a stream known locally as **Dugway Brook**, two obstruction buoys mark submerged pilings in 12 feet of water.

Charts 14826, 14839.—Cleveland Harbor, Ohio.—This harbor is distant by water about 176 miles southwesterly from Buffalo at the east end of the lake and 96 miles from Toledo at the west end. It consists of an outer harbor and an inner harbor made up of the Cuyahoga River, and the Old River which was the original outflow channel of the Cuyahoga River.

Channels.—Cleveland outer harbor is formed by a series

Structures Across the Grand River at Fairport

No.	Location and name	Kind	Miles above West Pierhead Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Submerged pipeline		0.38						Approximate depth unknown.
2	Aerial cable turning basin.		1.32				127.5		
		Junction	1.33						
3	Baltimore & Ohio bridge.	Railway	2.18	52.0	56.0		18.2		Swing.
4	do	do	2.74			72.3	20.5		Fixed.
4A	Aerial cable								
5	High Street bridge—Fairport.	Highway	2.76	115.0	115.0		10.9		Do.
5A	Aerial cable								
6	St. Clair Street bridge	do	3.25				15.0		
7	Aerial cable		3.48						

of breakwaters paralleling the shore for about 1 mile west and 4 miles east of the mouth of the Cuyahoga River. The main entrance from Lake Erie is through a dredged approach channel opposite the mouth of the river. The harbor may also be entered at the east end, and small craft may enter at the west end. The anchorage in the outer harbor has a mud and sand bottom. In the inner harbor, dredged channels lead upstream for about 5.6 miles in the Cuyahoga River and for about 1 mile in Old River which branches westward from Cuyahoga River 0.4 mile above the mouth.

The Federal project depths are 29 feet in the approach channel from deep water in the lake, thence 28 feet through the entrance channel to the mouth of the river and in West Basin, 28–27 feet in East Basin, and 25 feet in Airport Range. In the inner harbor, project depths are 27 feet in the Cuyahoga River from the mouth to the junction with Old River, thence 23 feet to the upstream limit of the project and 27 feet in Old River. (See Local Notice to Mariners and latest edition of charts for controlling depths.)

East Basin Disposal Area.—A 1,850-foot-long and 1,250-foot-wide disposal area is northward of Burke Lakefront Airport.

Aids to Navigation.—Cleveland Waterworks Intake Crib Light, a private aid with a foghorn, is 3.2 miles northwesterly of Cleveland harbor entrance. Cleveland East Pierhead Light is at the outer end of the East Breakwater diagonal arm extension marking the east side of the entrance to the main harbor. West Pierhead Light is at the outer end of the West Breakwater diagonal arm extension marking the west side of the entrance to the main harbor, and the lighthouse is floodlighted; a fog diaphragm horn and a radiobeacon are operated at this station.

East Breakwater Light is at the most westerly end of the main section of the East Breakwater, at the entrance. West Breakwater Light is at the most easterly end of the main section of the West Breakwater, at the entrance.

East Pier Light and West Pier Light mark the outer ends of the piers at the inner harbor entrance.

Cleveland East Entrance Light is at the east end of the east breakwater. A submarine cable extends southeasterly from this light to a point opposite on shore; vessels are cautioned not to drag anchors over the cable.

About a mile easterly of the East Entrance Light, at Gordon Park, a stone breakwater extends about 1,000 feet northwest from shore, then curves to the southwest in a length of about 1,000 feet. The outer portion is mostly submerged and is marked along its outer side by private unlighted buoys. In April 1978, an 88-acre diked disposal area was under construction enclosing the breakwater and extending eastward.

The construction area and dike are marked by orange and white buoys and lights, respectively.

Harbor Facilities.—From Gordon Park, southwesterly along the Cleveland waterfront to the area westerly of the West Breakwater west extension, the lake front is occupied by commercial activities, yacht and boat clubs, the Burke Lakefront Airport and other public utilities and facilities. The river throughout its project length, is also completely developed.

Public piers along the East Harbor are under the jurisdiction of the Cleveland-Cuyahoga County Port Authority. These docks are 24, 26, 28, 30 and 32. Permission to dock at any of these piers can be arranged through the Cleveland-Cuyahoga County Port Authority and/or by the vessel's agent. The charges for dockage and wharfage are contained in the Cleveland-Cuyahoga County Port Authority Tariff No. 1–B on file and available in 1972 at no charge from Cleveland-Cuyahoga County Port Authority, 101 Erieside Avenue, Cleveland, Ohio 44114.

The ore docks operated by the Cleveland & Pittsburgh Dock Company and the Erie Dock Company are private piers, designated for the unloading of iron ore. Dock 20, located at the entrance to the Cuyahoga River is owned by the Cleveland & Pittsburgh Railroad Company and is leased to the Cleveland Stevedore Company for docking purposes. Docks 34 and 36 are limited to shallow draft vessels. Permission to dock is by authority of the Director of Port Control, Burke Lakefront Airport, Cleveland, Ohio.

The Great Lakes Towing Co. has a floating dry dock on the Old River with length overall of 86 feet, width at entrance of 33 feet, and depth on blocks of 12 feet. The former American Ship Building Co. dry dock in the south slip at the westerly end of the Old River, is no longer available for use.

Harbor Traffic Control.—Vessel masters calling at the Port of Cleveland desiring information on the river traffic may obtain same by calling the Great Lakes Towing Co. Dispatcher's Office directly on VHF radio equipment, channel 16 (156.80 MHz) or channel 10 (156.50 MHz), or by radiotelephone through a land station. Telephone MAin 1–5094.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Cleveland, Ohio, is contained in the Port Series No. 43 (Revised 1970) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Coast Guard Station.—Cleveland Coast Guard Station is near the west end of Burke Lakefront Airport on the south side of a small basin 1.1 miles east of East Breakwater Light.

Intake Cribs.—A water intake channel of the Cleveland Electric Illuminating Co., protected by stone jetties, is located inside the pierhead line off the foot of 67th Street East, extended. The channel is 100 feet wide and about 550 feet long with the open end sheltered behind a curved breakwater extending off the westerly jetty.

An abandoned submerged crib is located 2,700 feet 172° from the East Entrance Light. The crib is inside the pierhead line, adjacent to a sea wall, and has a depth of 6 feet of water over it.

Chart 14826.—Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake tunnel of the waterworks of the city of Cleveland, Baldwin plant, commences on the shoreline

Structures Across the Cuyahoga River

No.	Location and name	Kind	Miles above West Pierhead Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Main River								
1	ConRail bridge	Railway	0.76			250	8.6		Vertical lift. Open clearance 98.6 feet. Radio Telephone. See note 1.
	Old River	Junction	.86						
2	Tunnel and submerged pipeline.		0.98						Approx. depth 60.4 feet. (48″ dia.)
3	Main Avenue Viaduct	Highway	1.01			218	92.7		Fixed. Minimum in the center 165 feet is 97.7 feet. See note 2.
4	Tunnel and submerged pipeline.		1.14						Approx. depth 57 feet. (40″ dia.)
5	Submerged cables		1.16						Approx. depth 34.5 feet.
6	Tunnel and submerged pipeline.		1.20						Approx. depth 56.7 feet. (48″ dia.)
7	Baltimore & Ohio RR. bridge.	Railway	1.28			229	8.7		Bascule. See note 3.
8	Center Street bridge	Highway	1.39			113	17.7		Swing. See note 4.
9	Detroit-Superior Viaduct.	do	1.42			113	98.0		Fixed. See note 5.
10	Union Terminal Viaduct.	Railway	1.89			200	98.2		Do.
11	Columbus Road bridge	Highway	1.93			220	17.6		Vertical lift. Open clearance 98.4 feet. See note 6.
12	ConRail bridge	Railway	2.24			200	8.4		Vertical lift. Open clearance 97.7 feet. See note 7.
13	do	do	2.42			200	23.5		Vertical lift. Open clearance 98.8 feet. See note 7.
14	Carter Road bridge	Highway	2.43			201	22.6		Vertical lift. Open clearance 97.3 feet. See note 6.
15	Eagle Avenue bridge	do	2.80			187	15.6		Vertical lift. Open clearance 97.5 feet. See note 8.
16	Submerged cables		2.80						Approx. depth 34 feet (6 cables).
17	Lorain-Carnegie Viaduct.	Highway	3.14			178	96.4		Fixed. Minimum in the center 140 feet is 97.7 feet. See note 5.
19	ConRail bridge	Railway	3.19			134	20.8		Bascule. See note 9.

See notes at end of table.

Structures Across the Cuyahoga River—Continued

No.	Location and name	Kind	Miles above West Pierhead Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Main River—Con.								
20	Submerged cable		3.33						Approx. depth unknown.
21	Norfolk & Western Ry. bridge.	Railway	3.34			200	64.2		Vertical lift. Open clearance 97.7 feet. See note 10.
22	Inner Belt Freeway bridge.	Highway	3.42			230	97.0		Fixed. Minimum in the center 199 feet is 97.0 feet. See note 5.
23	West Third Street bridge.	do	3.69			200	10.5		Vertical lift. Open clearance 97.3 feet. See note 6.
23A	Submerged cable		3.70						Depth unknown.
24	Aerial cable		3.71				118.0		
25	Submerged pipelines		4.32						Approx. depth 32 feet (2 ea. 6″ dia.).
26	Erie-Lackawanna Railroad bridge.	Railway	4.33			117	29.3		Bascule. See note 9.
27	Submerged cable		4.50						Approx. depth unknown.
28	Jefferson Avenue bridge.	Highway	4.51			100			Superstructure removed.
29	Submerged cable		4.52						Approx. depth 30 feet.
30	Submerged pipelines		4.65						Approx. depth 32 feet (3 ea. 6″ dia.)
31	Newburgh & South Shore Railroad.	Railway	4.71			110	11.1		Bascule. See note 11.
32	Aerial cable		4.73				118.0		
33	Submerged cable		4.74						Approx. depth unknown.
34	Baltimore & Ohio Railroad bridge.	Railway	4.75			110	10.3		Bascule. See note 12.
35	Aerial cable		4.76				118.0		
36	Submerged cables		4.77						Approx. depth 30 feet (2 cables).
	Turning Basin	Junction	4.91						
38	Overhead conveyor bridge.		5.35			210	99.0		Fixed. Republic Steel Corp. See note 5.
39	Overhead pipeline bridge.		5.39			210	99.0		Do.

See notes at end of table.

Structures Across the Cuyahoga River—Continued

No.	Location and name	Kind	Miles above West Pierhead Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Turning Basin—Con.								
40	Tunnel		5.40						Approx. depth 45 feet.
41	River Terminal RR bridge.	Railway	5.42			129	15.5		Bascule. See note 12.
42	Clark Avenue Viaduct	Highway	5.43			184	98.4		Fixed. See note 5.
43	Norfolk & Western Ry. bridge.	Railway	5.47			200	28.9		Vertical lift. Open clearance 97.7 feet. See note 7.
44	Submerged pipelines		5.48						Approx. depth unknown (5 pipes).
44A	Aerial cable		5.49						Clearance of cable unknown.
45	Submerged pipeline		5.78						Approx. depth unknown.
	Extent of Project	Limit	6.05						
46	Norfolk & Western Ry. bridge.	Railway	6.07						
47	Newburgh and South Shore R.R. bridge.	do	6.09						
48	Aerial cable		6.10				118.0		
	Old River								
48A	Main River	Junction	.86						
49	Baltimore and Ohio R.R. bridge.	Railway	.89			170	6.9		Bascule. See note 9.
49A	Submerged cable		1.00						Depth unknown.
50	Willow Avenue bridge	Highway	1.02				12.6		Vertical lift. Open clearance 98 feet. See Note 6. Channel through the draw is limited to 150 feet measured from the right fender (looking downstream).
51	Submerged pipeline		1.04						Depth unknown.

Whistle Signals for Opening Draws:

Main river: 1 long, 2 short (— — —).

Old River: 1 long, 1 short, 1 long, 1 short (— — — —).

All movable bridges are equipped with a whistle synchronized with a white light. Bridge operator will answer boat signal by a long and short whistle with light signal, and if bridges cannot be immediately opened, 3 blasts of whistle with light will be given as a check signal.

Bridge Closure Hours. Bridges over Cuyahoga River will be closed to river traffic as follows: Carter Road and Eagle Avenue bridges: 7:30 a.m. to 8:00 a.m., 8:15 a.m. to 8:45 a.m., 4:15 p.m. to 4:45 p.m., and 5:00 p.m. to 5:30 p.m.; provided that when these two bridges are

opened between 8:00 a.m. and 8:15 a.m. and between 4:45 p.m. and 5:00 p.m. the opening shall be so timed as to permit a moving vessel to pass through both draws; Columbus Road and West Third Street; 7:30 a.m. to 8:00 a.m. and 5:00 p.m. to 5:30 p.m. The above hours are not applicable to Sundays, legal holidays, and Saturday afternoons, nor at times of emergency when fire tugs request the opening of any draw, nor when there is a swift current in the river.

No. 1. Red lights mark four dolphins located one on each side of the channel above and below the bridge. Two lights at the midchannel point on the lift span, one on the upstream and one on the downstream side, show red until the bridge is fully open, then change to green. Limited coast station radiotelephone, call sign KUF 618, on 156.65 MHz or 156.8 MHz.

No. 2. Red light on each end of fender protection on right bank and red light on each of two dolphins on left bank.

No. 3. Three red lights are located on the fenders on each abutment. Two lights, one on the upstream and one on the downstream side of the bridge at the movable end of the bascule span, show red until the bridge is fully open, then change to green.

No. 4. Red light on each end of right abutment; red light on each end of protection to center pier; three lights above bridge, one at each end and one at middle, showing red when bridge is closed and green when open.

No. 5. Two green lights underneath bridge arch in midchannel, one upstream and one downstream; two red lights near each end of bridge span at limit of full horizontal channel clearance, one upstream and one downstream.

No. 6. Red light on each end of each fender. Two red, amber, and green lights at center of lift span, one upstream and one downstream; red light shows at all times except when bridge is fully opened; amber light shows with red while bridge is opening; green light replaces red and amber when bridge is fully opened.

No. 7. Red light on each end and center of each fender. Two lights at center of lift span, one upstream and one downstream, show red until the bridge is fully open, then change to green.

No. 8. Two red lights on each abutment, one upstream and one downstream; two lights in center of lift span, one upstream and one downstream, show red until the bridge is fully open, then change to green.

No. 9. Red light on each side of each abutment. Two lights, one on the upstream and one on the downstream side of the bridge at the movable end of the bascule span, show red until the bridge is fully open, then change to green.

No. 10. Three red lights are located on the fenders on each side of the channel. Two lights, one on upstream and one on downstream side, mark the midchannel point on the lift span and show red until the bridge is fully open, then change to green.

No. 11. Three red lights are located on the fender on the left bank, two red lights are located on the fender on the right bank. Two lights, one on the upstream and one on the downstream side of the bridge at the movable end of the bascule span, show red until the bridge is fully open, then change to green.

No. 12. Red light on each end of each fender. Two lights, one on the upstream and one on the downstream side of the bridge at the movable end of the bascule span, show red until the bridge is fully open, then change to green.

7,550 feet 207° from the East Entrance Light, and extends about 4¾ miles 290° to an intake crib in about 50 feet of water. The red-cylindrical crib is surmounted by a square grey house marked with a light, 55 feet above the water. An air fog diaphragm horn sounds as required.

The remains of two submerged cribs used in the construction of the Cleveland water intake tunnel are located along the axis of the tunnel. The shoreward crib, with least depth of 25 feet, is located 10,500 feet 026°19′ from Cleveland West Pierhead Light. The lakeward crib, with least depth 29 feet, is located 12,100 feet 349°55′ from Cleveland West Pierhead Light.

A second potable water intake tunnel of the city of Cleveland, Division Avenue plant, is located west of the Cuyahoga River entrance. There are two tunnels in the shoreward section extending from the shoreline to a submerged inner intake crib, and a single tunnel from that crib extending to a submerged outer crib. The easterly shoreward section commences at a point in the West Basin 4,900 feet 199° from the West Pierhead Light and extends 3,200 feet 320° to a turn and then continues about 2,800 feet 308° to the inner crib. The westerly section commences 5,950 feet 208° from the West Pierhead Light, and extends 5,600 feet 329° to the inner crib. The inner crib is in about 33 feet of water, has 29 feet over it, and is not marked. From the inner crib location, the tunnel continues 16,150 feet 335° to the outer crib. The outer crib is in about 50 feet of water, has 29 feet over it, and is marked with a lighted buoy.

Sewer Outfall.—A 60-inch diameter steel sewer outfall pipeline extends from shore at the west end of the west basin, commencing at the shoreline, 3,800 feet 204° from the West Pierhead Light. It extends 525 feet 353° to a turn, then 325 feet 310° to another turn, thence 2,325 feet 359° to the outlet. The top elevation of the pipeline is at 22.5 feet or more, the end is in about 27 feet of water, and it is not marked.

Captain of the Port Area.—See 33 C.F.R. § 3.45–65 of Rules and Regulations, preceding.

Anchorage Regulations.—See 33 U.S.C. 471, published in Certain Laws, preceding, and 33 C.F.R. § 110.1 and § 110.207 of Rules and Regulations, preceding.

Fishing and Hunting Regulations.—See 33 C.F.R. § 206.80 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.165 and § 207.570 of Rules and Regulations, preceding.

Local Harbor Regulations are established by the City of Cleveland and enforced by the **harbormaster** who can be contacted at Water Control Laboratory, New West Pier, Whiskey Island, c/o Water Control Laboratory, 1201 Lakeside Avenue, Cleveland, Ohio 44114. Copies of the regulations can be obtained from the Office of the City Clerk, Room 216, City Hall, 601 Lakeside Avenue, Cleveland, Ohio 44114. A **speed limit** of 4 m.p.h. is enforced within the harbor limits.

* * * * *

Bridges and Viaducts

Sec. 7.1511. A copy of the ordinances relating to the management of bridges and viaducts and the signals for opening and closing the same shall be posted up in the pilot house of every tug employed in navigating the Cuyahoga River or old river bed, and the harbormaster is hereby instructed to furnish, upon application, a printed copy of the same to the master of any such tug.

* * * * *

Sec. 7.1701. No more than one boat or craft for which the draw of any bridge has to be opened or swung shall pass through said draw at the same time.

Sec. 7.1702. The director of port control shall provide and maintain vessel signals on each city drawbridge; such signals shall consist of a red ball not less than 15 inches in diameter for use in daylight, and a red lantern for use in the nighttime; such signals shall be placed near the center of each such bridge, except that on the Columbus Street Bridge said signals shall be placed on the south draw span thereof; such signals shall be so arranged when elevated as to be seen easily up or down the river.

Sec. 7.1703. It shall be unlawful for any tug or other steam craft to give more than one call or signal to open a drawbridge, unless the captain, bridgetender, or other person in charge of the drawbridge shall fail to promptly run up the red ball or lantern on the bridge signaled to be opened.

Sec. 7.1704. All bridgetenders and other persons in charge of the drawbridges in the city of Cleveland shall always be on duty and constant watch during the hours assigned to them, and shall, as soon as they hear the signal given by any tug or other steam craft for their bridge to be opened, immediately run up the red ball during the day, or a red lantern during the night, and in addition to the above-mentioned signals, ring the bell or give such other signal as may be on the bridge, so that the person or persons in charge of the approaching craft may know that the bridge is to be opened for them to pass through; the red ball or light to be lowered as soon as the vessel has passed the draw. Any person violating any of the provisions of this section shall be subject to dismissal.

Sec. 7.1705. It shall be unlawful for the owner, officer, or other person in charge of any tug, steamer, or other vessel navigating the Cuyahoga River or old river bed to attempt to pass any city drawbridge until the red ball or lantern is up, or approach so near to any city bridge at such times as to damage the same while being opened or closed.

Sec. 7.1706. The captain, bridgetenders, or other persons in charge of any of the drawbridges shall not close the same against vessels or boats seeking to pass through, until passengers and teams have been delayed fully 10 minutes by the said draws of the above-mentioned bridges being open.

Sec. 7.1707. Whenever, between the hours of 7:15 a.m. and 5 p.m., persons, teams, or vehicles have been delayed fully 10 minutes by reason of the drawbridges being open for vessels or boats to pass through, it shall be the duty of the captain, bridgetender, or other person in charge of the drawbridge to lower the red ball or lantern and immediately close such draw and keep the same closed for fully 10 minutes for such persons, teams, or vehicles to pass over (if so much time shall be required), when said draw shall be opened again and be kept open (if necessary for vessels or boats to pass) for a like period of 10 minutes, and so alternately if necessary during the hours aforesaid.

Sec. 7.1708. The director of port control shall by rule designate the hours when it may be necessary to keep any city drawbridge closed for the accommodation of traffic.

Sec. 7.1709. Whenever at any alarm of fire, any fire engine, hose cart, or other fire apparatus shall approach any drawbridge for the purpose of crossing the same toward such fire, the captain, bridgetender, or other person in charge of the draw, shall, if such bridge is open, lower the signal and close the said draw as soon as practicable, or if closed, keep it closed until such engine, hose cart, or other fire apparatus shall have had an opportunity to pass over said drawbridge, notwithstanding vessels or boats may thereby be delayed.

Sec. 7.1710. Whenever a funeral procession may be crossing a drawbridge, and a signal be given by a vessel or boat passing up or down the Cuyahoga River to open the draw, the captain, bridgetender, or other person in charge of the drawbridge over which the procession is passing shall raise the red ball or lantern, but shall not ring the bell or give such other signals as may be on the bridge, or open the draw until the procession has passed over. After raising the red ball or lantern, indicating that the vessel signal has been recognized, he shall immediately lower the red ball or lantern and keep the same lowered until the procession has passed, when he shall raise it again.

Sec. 7.1711. In case of danger or inability to open any drawbridge, the captain or tender in charge thereof shall lower the red ball or lantern as an indication to approaching vessels that the passage is closed.

Sec. 7.1713. No material of any kind shall be deposited under any of the viaducts, without a permit from the Director of Port Control; no material shall be deposited adjacent to viaduct that would injure the structure in case of fire; and no bills, posters, or advertisements of any kind shall be posted on any part of any viaduct.

Sec. 7.1714. Any person violating any of the provisions

of this subdivision shall be fined not less than $5 nor more than $25, and shall also be liable to the city for all damage that may be done to the drawbridge by collision or otherwise.

Section III—South Shore From Cleveland To Point Marblehead, Ohio

Chart 14826.—From Cleveland, the coastline, consisting of 10 to 20-foot-high bluffs and sandy beaches, has a generally westerly trend to Avon Point, a broad rounding point projecting somewhat to northward about 15 miles from the Cleveland entrance. From Avon Point to Lorain, about 10 miles southwesterly, the bluffs are smaller. The shoal border between Cleveland and Lorain follows within 1.2 miles of the shore.

Outfall Sewer.—A submarine pipeline outfall sewer of the city of Lakewood, Ohio, constructed about 1916, commences at a point on the shoreline 1,200 feet from Rocky River Breakwater south end and extends about 1,300 feet 357° into about 22 feet of water. The pipeline is not marked.

Rocky River Harbor, Ohio.—This harbor is at the mouth of the Rocky River, located about 6½ miles westerly from Cleveland Harbor entrance, at the city of Lakewood. There is no traffic except by recreational craft.

Channels.—The harbor is entered from Lake Erie through a dredged entrance channel on the southwest side of a pier that extends lakeward from the east side of the mouth of Rocky River. The dredged channel extends upstream for 0.9 mile above the mouth. There is an anchorage basin on the southwest side of the channel just inside the mouth of the river. In 1977, the midchannel controlling depths were 8 feet from the deep water in the lake through the entrance channel to the upper end of the anchorage basin, thence 3 feet to the upstream limit of the Federal project except for shoaling to bare in the upper 300 feet.

Aids to Navigation.—Rocky River Outer Light is located at the outer end of the pier. The Inner Light is located at the inner end of the pier, 920 feet 133° from the Outer Light.

Harbor Facilities.—The public ramp and dock of Lakewood, Ohio, is located on the easterly bank of the river immediately upstream from the Lake Road highway bridge. Marine hoists and fuel are available at yacht club docks.

Bridges.—The Clifton Westlake highway bridge, the Norfolk and Western Railway bridge and the Lake Road highway bridge cross the river at approximate distances of 1,800, 2,400 and 3,200 feet upstream from the inner end of the east pier. The bridges are of the fixed type with minimum vertical clearance of 49.0 feet.

Aerial cable.—An aerial electric cable crosses immediately downstream of the Norfolk and Western Railway bridge; vertical clearance, 49.5 feet.

Fishing and Hunting Regulations.—See § 206.80 of Rules and Regulations, preceding.

Local Harbor Regulations.—Harbor regulations have been established by the city of Lakewood. A 6 m.p.h. speed limit is enforced by the Department of Public Safety. Copies of the regulations may be obtained from the Department of Public Safety.

Dumping Grounds.—About 1¼ miles north of the entrance to the Rocky River, Ohio, is a dumping ground in more than 35 feet of water. It is about ½ mile square with a least depth of 35 feet and is not marked.

About 3¾ miles north of the Rocky River, Ohio, is a dumping ground in more than 50 feet of water. It is about ½ mile square with a least depth of 35 feet and is not marked.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake of the city of Cleveland, Clague Road plant, with a least depth of 19½ feet over it, is located 3 miles 310° from Rocky River Outer Light. The intake pipeline extends from a point on the shoreline 13,000 feet 260° from Rocky River Inner Light, 12,700 feet 000° to the intake. This structure is marked on the lakeward side with a buoy from 1 May to 30 November.

Wreck.—The wreck of the steamer Sand Merchant which sank 17 October 1936, lies upside down off Avon Point, 13½ miles 288° from Cleveland West Pierhead Light, in 54 feet of water and with a swept depth of 35 feet over this area in 1973. The wreck is not marked.

Wrecks.—The wrecks of the tug Black Marlin and the derrick barge Hickory are in the vicinity of Avon Point. They are not marked.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline of the village of Avon Lake commences at the shoreline 3,000 feet 068° from the stack at the Cleveland Electric Illuminating Co., and extends 1,900 feet 000° to a crib. There is a depth of 20 feet of water over the crib and it is not marked.

Wreck.—A steel barge, sunk in 1958, lies in 43 feet of water with 26 feet of water over it, approximately 1¾ miles 026° from the tank at Avon Point, Ohio.

Cleveland Electric Illuminating Co. A light is located about 2¼ miles westerly from Avon Point and marks the outer end of a system of breakwaters inclosing the settling basins of the Cleveland Electric Illuminating Co.'s water intake.

Wreck.—The wreck of a loaded stone barge, with 6 feet of water over it and surrounding depths of 7 to 14 feet, is reported to lie about ¼ mile northwesterly from the Illuminating Co.'s plant.

Outfall Sewer.—The city of Avon Lake sewer outfall, located in the vicinity of Miller Road, about 3,000 feet west of the Cleveland Electric Illuminating Co., extends 1,085 feet into the lake. There is a depth of 10 feet over the outlet, which is not marked.

Shoals off Lorain Entrance.—A shallow area with limiting depth of 24 feet lies within a distance of 2 miles

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north of Lorain East Breakwater Light, and an area with limiting depth of 22 feet lies within a distance of 1¾ miles northeast of the East Breakwater Light.

Submerged Pilings.—An unlighted buoy is maintained by the city of 1.2 miles 079° from Lorain East Pier Light, to mark the most lakeward piling offshore from the foot of Kansas Avenue.

Charts 14826, 14841.—Lorain Harbor, Ohio.—This port is located about 28 miles west of Cleveland Harbor and comprises the lower 3 miles of the Black River, Ohio and an outer harbor.

Channels.—The harbor is entered through a dredged entrance channel that leads east-southeastward from the deep water in Lake Erie on the south side of a detached breakwater, and then leads southeast between converging breakwaters to the mouth of Black River. The mouth of the river is entered between parallel piers, and the dredged channel leads upstream for about 2.8 miles. There are turning basins 1.6 miles above the mouth and at the head of the project. In the outer harbor, are basins on either side of the entrance channel. From the south side of the outer harbor west basin, and approach channel leads southeast to the municipal pier 0.2 mile west of the mouth of the river.

In May 1978, the midchannel controlling depths were 28 feet from deep water in the lake to the lakeward end of the converging breakwaters, thence 26 feet through the outer harbor channel into the mouth of the river, thence 25 feet to the Norfolk and Western railway bridge, thence 23 feet to the upstream Federal project limit with 17 feet in the lower turning basin except for shoaling along the edges, and 15 to 19 feet in the upper turning basins except for shoaling along the edges. The basins in the outer harbor had depths of 22 feet except for shoaling along the edges.

The enlargement forming a turning basin abreast of the U.S. Steel Corp. dock is of ample size to accommodate the largest vessels. A timber intake skimmer is located near the upstream end of the U.S. Steel Corp. dock.

In 1976, a semicircular dike disposal area was under construction on the northeast side of the east breakwater.

Aids to Navigation.—Lorain Harbor Light, 60 feet above the water, is shown from a white steel tower on the west end of the new detached breakwater; a diaphragm horn fog signal sounds as required. Lorain Detached Breakwater East Light is on the easterly end of the new detached breakwater. Lorain East Breakwater Light is on the most northerly end of the East Breakwater. West Breakwater Light is on the northerly end of the West Breakwater. West Pier Light, near the outer end of the west pier at the mouth of the Black River, forms with the West Breakwater Light, a range for approaching the harbor. East Pier Light is at the end of the east pier.

Lorain Harbor East Breakwater Middle Light is located 1,700 feet 053½° from Lorain Harbor West Pier Light. The light is 25 feet above the water on a white column. This light marks the south side of the 100-foot gap between the old detached east breakwater and the new breakwater, completed in 1964, which extends from the position of the light to the shoreline at the foot of Arizona Avenue.

A buoy, inside the breakwaters, marks the northeast side of the channel at the entrance to Black River.

Harbor Facilities.—Shipyard facilities are available for any size ship. Practically all types of services are obtainable and gasoline may be procured at dockside pumps.

The Toledo, Lorain, and Fairport Co. has a coal loading facility, with a car dumper, on the southwest side of the large slip close southwestward of the entrance to Black River. Depths were reported to be 23 to 24 feet alongside the facility.

An ore-handling facility is on the west side of the river near the entrance. Another ore-handling facility is 2.7 miles upstream from the entrance to the river, at the plant of the U.S. Steel Corp., Lorain-Cuyahoga Works, Lorain Plant dock opposite the turning basin. Depths were reported to be 27 feet alongside the facility near the entrance, and 23 to 28 feet alongside the facility further upstream.

There are many other docking facilities along both sides of Black River. All of the deep-draft facilities are privately owned and operated. For more information about docking facilities at Lorain, refer to the paragraph concerning Port Series, or contact the operator of the facility.

The Lorain Yacht Basin, the largest small-craft facility at Lorain, is near the river entrance between the city of Lorain Water Pollution Control Plant and the Coast Guard slip. Depths of 4 to 6 feet were available in May 1976.

Dry Docks.—The American Ship Building Co. operates two dry docks having the following dimensions as of July 1977:

	Dock No. 2	Dock No. 3
	Feet	*Feet*
Length of ship overall	730	1, 025
Width at bottom	82	125
Width at top	82	125

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Lorain, Ohio, is contained in the Port Series No. 42 (Revised 1970) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Coast Guard Station.—Lorain Coast Guard Station is located on the easterly side of the Black River near its mouth.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline of the city of Lorain, Ohio, extends about 1,930 feet 291° from the inner harbor area, under the West Breakwater, to a crib in 22 feet of water. The crib, having 12 feet of water over it, is located about 2,130 feet 209° from the West Breakwater Light, and is not marked.

About 2.1 miles southwesterly of the mouth of the Black River, at the Elyria waterworks, two intake pipes of the

Structures Across Black River at Lorain

No.	Location and name	Kind	Miles above mouth of river	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Tunnel		0.35						Approx. depth 49.4 feet.
2	Pipeline		.38						Approx. depth 52.3 feet.
3	Erie Ave bridge	Highway	.61			180	†33.5		Double-leaf lift. See note 1.
4	Submerged cables		1.23						Approximate depth 27 feet.
5A	Norfolk & Western Ry bridge (Max. raise to 123.6 ft.)	Railway	1.26			203	35.7		Vertical lift. Comp. 1975. See note 2
7	21st St. bridge	Highway	2.12			256	98.7		High level.
8	Aerial cable		2.13				120.0		

†At center.

NOTE 1.—Signal for opening draw, 1 long, 2 short (——— — —). Bridge is equipped with a whistle synchronized with a white light. Bridge operator will answer boat signal by a long and short whistle with light signal, and if bridge cannot be immediately opened 3 blasts of whistle with light will be given as a check signal.

Red, amber, and green lights at center, showing red at all times except when bridge is fully opened, amber with red while bridge is opening, and green replacing red and amber when bridge is fully opened; also a red light at each fender.

NOTE 2.—Signal for opening draw and operation of a synchronized whistle and light on the bridge are same as stated in note 1.

Two red lights indicate channel when bridge is closed, and show green when bridge is open; a third red light is displayed if bridge cannot be opened.

city of Elyria, Ohio, extend 1,600 feet into the lake, each terminating in a crib with depth of 13 feet over it.

A water intake for the Ohio Edison Co., located 23,700 feet 224° from Lorain Harbor Light, extends 1,435 feet 342° to a crib with 12 feet over. It is marked by a buoy.

Fishing and Hunting Regulations.—See § 206.80 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.165 and § 207.570 of Rules and Regulations, preceding.

Local Harbor Regulations are established by the Lorain Port Authority and enforced by the **harbormaster** who can be reached at the Department of Public Service or through the Lorain Port Authority, City Hall, Lorain, Ohio 44052. Copies of the regulations can be obtained from the harbormaster or the Port Authority.

Chart 14826.—From Lorain to Vermilion, Ohio, the coastline is open and stretches southwesterly for about 5 miles, with the 24-foot contour about ⅜ mile off, and thence it extends a like distance westerly to Vermilion, with shoals increasing to ½ mile width.

Beaver Creek Harbor, Ohio, is a small boat harbor and summer resort at the mouth of Beaver Creek, about 4 miles southwest of Lorain Harbor. In May 1967, the channel near the mouth was about 50 feet wide and 3 to 4 feet deep. A bar forming across the entrance reportedly washes out during the spring and after some storms, and restricts the harbor to small shallow draft craft. The easterly side of the entrance is marked by a 380-foot long stone pier with a private fixed green light mounted on a pole near its outer end. A privately maintained range consisting of a fixed red front light on a pole mounted on the short west pier and a fixed red light on a pole inside the harbor, marks the entrance. Gasoline, at dockside pumps, and service are available in the harbor. This harbor is within the legal boundary of the City of Lorain and Local Harbor Regulations of Lorain apply. (See Local Harbor Regulations for Lorain, preceding.)

Charts 14826, 14830.—Vermilion Harbor, Ohio.—This

harbor, used mainly by fishing and recreational craft, is located about 34 miles westerly from Cleveland. It comprises the lower 3,000 feet of the **Vermilion River**, and a channel of approach from the lake.

Channels.—The approach to the river from Lake Erie is through two dredged channels that lead around either end of a detached breakwater, join, and lead southward between two piers at the mouth of the river. The channel leads upstream for about 0.6 mile to the Liberty Avenue bridge.

In 1977, the controlling depths were 5½ feet in the west approach channel except for a shoal with a least depth of 3½ feet on the south side of the channel just west of the entrance to the pier channel, 7 feet in the east approach channel except for a shoal with a least depth of 5½ feet on the south side of the channel just east of the entrance to the pier channel, thence 8 feet through the pier channel to the junction with Superior Lagoon, thence 2 feet to the Liberty Avenue bridge.

Aids to Navigation.—Vermilion West Pierhead Light 4 is on the west pier near the outer end. East Pierhead Light 5 is located on the outer end of the east pier. The detached breakwater has lights on the east, middle and west ends.

A lighted tank with the name VERMILION on the side is prominent.

Harbor Facilities.—Marine services include 5 lift and repair facilities and many gas and diesel fuel facilities. Private visitors' dockage is available for pleasure craft in addition to 3 public dockage areas.

Water Intake.—A submerged water intake crib of the city of Vermilion, with about 3 feet of water over it, is located about 1,200 feet 263° from Vermilion West Outer Light. The crib is marked by a buoy.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A submerged water intake crib of the city of Vermilion, with 8 feet of water over it, is located about 1,400 feet 272¾° from Vermilion West Outer Light. The crib is marked by a buoy.

Fishing and Hunting Regulations.—See § 206.80 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.160 and § 207.565 of Rules and Regulations, preceding.

Dumping Ground.—About 2¼ miles north of the entrance to Vermilion Harbor, is a dumping ground in more than 32 feet of water. It is about ½ mile square with a least depth of 32 feet and is not marked.

Obstructions.—Just south of the dumping ground, there are several fish net stakes in more than 30 feet of water close to the recommended vessel course between Huron and Lorain, Ohio.

An outlying shoal spot with 6 feet depth and more than 10 feet surrounding, lies approximately 3,000 feet 286° from Vermilion West Outer Light. The south edge of the shoal is marked by a buoy.

Chart 14830.—The coast extending southwesterly from Vermilion has rocky and stony shallows reaching one mile off, this character prevailing to a point about 7¼ miles from Vermilion and about 3¾ miles east of Huron, the most southerly point on the lake. Thence to Huron, northwesterly, deep water approaches to within ½ mile of the shore line. An unmarked outlying shoal spot with 13 feet depth lies 1⅜ miles northeasterly from Huron Light.

Net Stake Obstructions.—From a point about one mile offshore from Huron Harbor, Ohio, an area about 2 miles square is very thick with fish net stakes. The recommended vessel courses from Huron Harbor pass through this region.

Charts 14830, 14843.—Huron Harbor, Ohio.—This harbor, which is about 44 miles westerly from Cleveland, comprises the lower mile of the **Huron River**, two connecting slips, and an outer harbor and entrance channel.

Channels.—The harbor is entered through a dredged channel leading southwestward from deep water in Lake Erie between a pier and an adjacent disposal area on the northwest side, and a breakwater on the southeast side to the mouth of the Huron River. The channel leads into the river to a turning basin with its upper end about 0.4 mile above the mouth. In July 1978, the controlling depth was 23 feet at midchannel through the entrance channel to the turning basin with 24 feet in the basin.

A semicircular diked disposal area is on the west side of the west pier.

Aids to Navigation.—The channel entrance is buoyed in the open water. **Huron Harbor Light** is on the northerly end of the west pierhead; a fog signal sounds at this light as required. Huron Inner Light is located at the bend of the west pier, 2,400 feet 215° from Huron Harbor Light. Vessels must keep at least 125 feet easterly of the alinement of these two lights, to clear the westerly bank of the channel. Huron East Breakwater Light is on the north end of the East Breakwater. Huron Inner East Light is 320 feet 142° from Huron Inner Light.

Harbor Facilities.—Two slips operated by the Lake Erie Dock Co. have been constructed on the east side of the river, one being located at the upper limit of the Federal project and the other 600 feet upstream therefrom. The lower slip is 1,150 feet long, 140 feet wide, and 17 to 20 feet deep. The upper slip is 1,450 feet long, 180 feet wide, and 27 feet deep. The wharves adjacent to the slips are equipped with coal and ore handling machinery.

The Pillsbury Company operates grain handling equipment on its wharves at the upper limit of the turning basin and the westerly side of Slip No. 2.

The west bank of the Huron River, for a distance of more than one mile upstream, has many small boat facilities of all classes.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Huron, Ohio is contained in the **Port Series No. 42** (Revised 1970) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Fishing and Hunting Regulations.—See 33 C.F.R. § 206.80 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.165 and § 207.570 of Rules and Regulations, preceding.

Local Harbor Regulations are established by the City of Huron and enforced by local law enforcement officials. A speed limit of 6 m.p.h. is enforced within the harbor lim-

Structures Across Vermilion Harbor and River

No.	Location and name	Kind	Miles above West Outer Lt.	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Submerged pipeline		0. 27						
2	Submerged cable		. 56						
2A	Submerged pipeline		. 57						
3	Submerged pipeline		. 58						
3A	Aerial Cable		. 68						
4	Liberty Ave. bridge	Highway	. 69			147. 0	12. 8	8. 2	Fixed.
4A	Aerial cable		. 72						
5	Submerged pipeline		. 74						
5A	Aerial cable		. 75						
5B	Aerial Cable		. 78						
6	Penn Central bridge	Railway	. 79			75. 0	21. 6		Fixed.
6A	Aerial Cable		. 99						
7	N & W bridge	Railway	1. 00				14. 0		Do.

its. Copies of the regulations may be obtained from the City Manager, Municipal Building, Huron, Ohio 44839.

Dumping Ground.—About 3½ miles due north of the entrance to Huron Harbor, Ohio, is a dumping ground in more than 35 feet of water. It is about one mile square with a least depth of 35 feet and is not marked.

Water Intake.—A water intake pipeline commences to a point on the shoreline 2,230 feet 275° from Huron Inner Light and extends 1,140 feet 000° to a crib in about 9 feet of water. There is a depth of 5 feet over the crib and it is not marked.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline of the city of Huron, Ohio, commences at a point on the shoreline 2,780 feet 279° from Huron Inner Light and extends 2,000 feet 017° to an intake crib in about 14 feet of water. There is a depth of 11.6 feet over the crib and it is not marked.

Chart 14830.—From Huron the wooded coast runs northwesterly to Cedar Point, the entrance to Sandusky Bay and the Sandusky Harbor entrance channel. The bay is a shallow body of water with an area of about 22½ square miles. Point Marblehead and Bay Point are northwest of the bay entrance. Near the Huron piers, shoals extend off about ¾ mile, and a detached 15-foot spot is found nearly ⅞ mile out at a point 2 miles from Huron. Otherwise, the water is deep-to within about ¾ mile until Cedar Point is reached, where the shallow area gradually widens to 1¼ miles.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. About 3¼ miles 300° from Huron Inner East Light, an intake pipeline of the National Aeronautics and Space Administration Lewis Research Center, extends about 3,400 feet 048° to a crib in about 22 feet of water. There is a depth of 16 feet over the crib and it is not marked.

Charts 14830, 14842, 14844, 14845.—Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. About 3 miles southeasterly from the Sandusky entrance channel, the city of Sandusky has an intake pipe which commences at the waterworks located north of the entrance to Pipe Creek in the city of Sandusky and extends in a straight line through the marshland, under the Cedar Point causeway and on into Lake Erie. The Lake Erie section extends from the shore 3,000 feet 052° to a crib in about 21 feet of water. There is a depth of 16 feet over the crib and it is not marked.

Chart 14845.—Sandusky Harbor, Ohio.—Entrance to the harbor of Sandusky, which is located in the easterly part of Sandusky Bay, is about 50 miles westerly from Cleveland Harbor entrance.

Channels.—The harbor is entered from Lake Erie through a dredged entrance channel that leads southwest from deep water in the lake along the northwest side of a jetty extending northeast from Cedar Point. Inside Cedar Point, the channel turns south-southwest across Sandusky Bay. About midway across the bay, the channel divides with the deeper channel leading west then south along a deep-draft wharf to a turning basin at the southwest corner of the harbor. The shallower channel continues south-southwest to a channel leading west along the Sandusky docks to the turning basin.

The Federal project depths are 26 feet in Moseley Chan-

Structures Across Huron River

No.	Location and name	Kind	Miles above Huron Inner Light on west pier	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Submerged pipelines		0.70						Approx. depth 20½ feet.
2	Aerial cables		.72				66.3		
3	Cleveland Rd., E. Huron	Highway	.73			86	21.0		Fixed.
4	Submerged pipeline		.73						Approx. depth 32 feet.
5	Submerged cable		.73						Approx. depth 25 feet.
6	Aerial cables		.77				52.0		
7	ConRail bridge	Railway	.79	57	57		19.0		Fixed.
8	Submerged pipeline		.79						Approximate depth unknown.
9	Aerial cable		.80						
9A	Submerged pipeline	Water	.81						
9B	Mason Rd. bridge	Highway	6.56			91	16.7		Fixed. Under const. in 1974.
10	Fries Landing bridge	Highway	7.70			149	*		
11	Norfolk & Western Ry	Railway	7.90	102	99		35.7		Fixed.
12	Ohio Turnpike Twin bridges.	Highway	8.80			80	30.0	25.4	Do.

*Destroyed 4 July 1969. East abutment remains visible.

nel, 25 feet in Upper Straight Channel and Upper Bay Channel, 24 feet in Lower Bay Channel and the turning basin, 22 feet in Dock Channel, and 21 feet in Lower Straight Channel. (See Local Notice to Mariners and latest edition of charts for controlling depths.)

It is the recommendation of the Lake Carriers' Association that, at the junction of the straight channel and the bay channel, the master of an outbound vessel should slow down if necessary to avoid meeting vessels at the intersection. This recommendation should not be construed as relieving the inbound vessel of the obligation to exercise due caution in approaching the intersection.

Aids to Navigation.—The outer end of the outer bar channel (Moseley) is marked with buoys 1 and 2 located about ¾ mile northeast of Sandusky Pierhead Light. The Outer Range (Moseley Channel) consists of two lights on the middle ground in Sandusky Bay, and the alinement, 237°, marks the axis of the outer bar channel (Moseley) from the lake to the intersection with the straight channel range inside of Cedar Point, a distance of about 7,600 feet. Sandusky Pierhead Light is on the pierhead at the outer end of the east jetty; an air fog diaphragm horn sounds as required. Buoy 9 marks the south bank near the inner end of the outer bar channel (Moseley).

The Inner Range consists of two lights on Bay-Sand-Point bar opposite Cedar Point, and the alinement, 197°, marks (astern) the axis of the straight channel from Cedar Point to the Baltimore & Ohio Railroad wharves, a distance of about 10,500 feet. Protective rip-rap extends horizontally out from the base of the front range light about 16 feet and from the rear range light about 28 feet and should not be passed close aboard even by vessels of shallow draft. The lighted clock tower of the Erie County Courthouse is prominent on the line of this range. It is marked at the top by an occulting green light, 170 feet above the water. A radio-beacon station is located on the west side of Cedar Point, 1,275 feet 151° from Inner Range Front Light. Lighted and unlighted buoys mark the straight channel to lakeward of its junction with the bay channel.

Lighted buoys 16 and 18 mark the widened channel at the turn from the straight channel into the dock channel opposite the Baltimore & Ohio Railroad wharves.

The dock channel extends along the main city front on bearing 244° and is well marked with buoys. The south line is marked at the east end of the turning basin by lighted buoy 21. Dock Channel Light is shown on a pipe tower near the outer end of the Erie Sand and Gravel Co.'s dock at the foot of McDonough Street.

Sandusky Harbor Turning Basin Light, mounted 25 feet

above the water on a white steel column, is located on the southwest end of the rubble-mound rock dike at the edge of the turning basin.

The bay channel extending to the straight channel on a line parallel to and north of the dock channel is marked on its outer prolongation by a range of lights; the front light is 4,025 feet 137¾° from the outer range rear light, and the rear light is 1,000 feet 063¾° from the front light. Buoys 7 and 5 mark the widened channel at the turn along the new dock into the exit (bay) channel; and lighted buoy 2 and straight channel lighted buoy 14 mark the widened channel at the turn from the bay channel into the straight channel. The banks of the channels are also marked by buoys.

Sludge Basin Light is on the northeast corner of the sludge basin wall, 675 feet 172° from the light on the abandoned intake crib in the bay. East Cove Lighted Buoy 1, about 585 feet 214° from Sandusky Sludge Basin Light, marks the northerly end of a stone jetty.

Harbor Facilities.—A small-boat basin about 700 feet wide and 2,300 feet long is located on the southwest side of Cedar Point. The entrance is between two lights. In July 1977, the reported controlling depth through the entrance and in the basin was 11 feet.

A small-boat basin, on which boat works and marine service stations are located, is situated behind the ConRail fill south of the sludge basin. Access to this basin is afforded through the railroad bridge adjacent to the inner end of the southerly wall of the sludge basin. Limiting dimensions of the passage through the bridge, which normally remains in the full open position, are 35 feet horizontally and 6¾ feet vertically.

The city of Sandusky has constructed a small-boat basin about 500 feet wide and 1,200 feet long at Battery Park. Two range lights, 12 and 15 feet above water on cylindrical standards, are maintained by the city to mark the entrance to the basin.

Caution Note.—Fluctuations of Water Level.—In addition to the fluctuations of level which affect Lake Erie somewhat uniformly, as noted in the "General Description" of this lake, strong winds produce abnormal fluctuations in Sandusky Bay, which, in combination with prevailing high or low water, may reach a maximum effect of 6 feet above or 2½ feet below Low Water Datum.

In July 1977, it was reported that the pier from Cedar Point to Sandusky Pierhead Light is partially submerged during periodic high water conditions.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Sandusky, Ohio is contained in the **Port Series No. 42** (Revised 1970) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Coast Guard Station.—The nearest Coast Guard station is at Marblehead, about 3½ miles north-northwestward of the entrance to Sandusky Bay. The emergency telephone number, 419-626-0686, for reporting Search and Rescue incidents in the Sandusky area is toll free to Sandusky residents.

Submarine Crossings.—A submarine cable crosses the outer bar channel (Moseley) from a point about 200 feet lakeward of the Inner Range Front Light to a point just east of the Coast Guard wharf on Cedar Point. A submarine cable extends from the northwest corner of the Battery Park basin on a line to the front light of the range marking the bay channel. Vessels should not drag anchor in the vicinity of these cables.

Sewer Outfall.—A 48-inch diameter sewer outfall pipeline extends across the dock channel bayward from the foot of Harrison Street, extended, to a point approximately 500 feet northerly of the rock dike paralleling the dock channel, and about 200 feet easterly of the Pennsylvania spur dike.

Bridge Regulations.—See **33 U.S.C. 499**, published in Certain Laws, preceding, and **33 C.F.R. § 117.706** of Rules and Regulations, preceding.

Fishing and Hunting Regulations.—See **33 C.F.R. § 206.80** of Rules and Regulations, preceding.

Navigation Regulations.—See **33 C.F.R. § 162.155** and **§ 207.560** of Rules and Regulations, preceding.

Charts 14830, 14842, 14844.—Sandusky Bay.—Sandusky River, Ohio, enters Sandusky Bay at its upper or westerly end, about 16 miles above Sandusky, through the bay, and is navigable for small vessels as far up as the lower Norfolk and Western Ry. (N.Y., Chi. & St. L., R.R.) bridge at Fremont, Ohio, about 15½ miles above its mouth. Below the ConRail bridge, crossing the bay about 9 miles below the mouth of the river, there is a general depth through the bay of about 7 feet, with no definite channel; above the bridge to Muddy Creek Bay the depth is about 5 feet, with no definite channel. Muddy Creek Bay has depths of 2 to 4 feet with no definite channel to the river. In the river, the depths vary from 2 to 19 feet or more, the lesser depths being on the several so-called bars, and in the channel near the mouth crossing Muddy Creek Bay where there are deposits of sand and gravel. The entrances at Muddy Creek Bay and the river, about halfway to Fremont, are marked by numerous unlighted buoys established by the Coast Guard. At the entrance to Muddy Creek Bay at the westerly end of Sandusky Bay, the marked channel begins and continues for about 2 miles to the mouth of Sandusky River. Small craft are warned to use the marked channel only as submerged rubble dikes exist protruding out from both sides of the river entrance. Much of this rubble may be awash.

Three black H-pile posts with white square daymarks 12 feet above water are located (No. 1) 22,475 feet 229½° (No. 3) with light also 23,200 feet 231°, and (No. 5) 24,080 feet 230½° from Sandusky Bay Transmission Line Light "B" to mark a submerged breakwater about 1,800 feet west of Willow Point.

The ConRail bridge mentioned above has been filled solid in various places, so that only about two-sevenths of its length is open. This causes strong currents to flow out and in through the openings, and appropriate caution should be exercised in that vicinity. Except for the main draw opening, three other openings in the causeway allow passage of small boats only with a maximum vertical clearance of 8.8 feet. Extreme caution should be exercised in passage due to piles which are awash at chart datum. Four sub-

marine cables cross the bridge opening on the downstream side, with a least depth over them of 11 feet.

Bridges.—Two highway bridges cross the bay from Martin Point to Danbury, Ohio. The bridges are located approximately 2,000 feet and 4,000 feet west of the railroad bridge. The second highway bridge has fixed bridge openings located at 0.25 mile, 1.08 miles and 2.03 miles respectively, from the Danbury terminus. The bridge opening at 0.25 mile has a horizontal clearance of 47 feet and a vertical clearance of 12.6 feet. The bridge opening at 1.08 miles has a horizontal clearance of 65 feet between fenders and a vertical clearance of 43.1 feet. The bridge opening at 2.03 miles has a horizontal clearance of 46 feet and a vertical clearance of 10.7 feet.

Wreck.—The wreck of a barge about 80 feet long and 30-foot beam, with one-half foot of water over it and surrounding depths of 4 feet, lies 1,550 feet south of the north shore of Sandusky Bay 3¼ miles west of the highway bridges. The wreck is not marked.

Transmission Line Lights.—Two lights mark the channel under the overhead transmission line of the Ohio Public Service Co., crossing Sandusky Bay just above the ConRail bridge. The lights are shown on two of the concrete piers supporting the towers of the transmission line, about in line with the railroad draw opening. The transmission line has vertical clearance of 64.8 feet in the main channel opening and 34.8 feet in the other openings.

Johnson Island, Ohio.—Johnson Island is located in the northeasterly section of Sandusky Bay about ½ mile west of Bay Point and about ⅝ mile south of the most northerly bay shoreline. The island is about ½ mile wide and one mile long and is connected to the northerly shore of the mainland by a roadway over the Johnson Island Causeway.

The causeway is of rubblemound construction and has five bridged openings at various locations. The midpoint opening has a vertical clearance of 25 feet and a horizontal clearance of 50 feet. The four openings on either side of the causeway midpoint opening have a minimum horizontal clearance of 50 feet and a vertical clearance of 4 feet.

There is shallow water within a line joining the Sandusky outside buoy and Point Marblehead. A buoy is in 14 feet of water, about 3,100 feet 017° from Sandusky Straight Channel Inner Range Rear Light to mark the east side of Bay Point Shoal, a 4-foot shoal. In the outlying waters, a spot with 23 feet depth lies 2 miles northeasterly from Sandusky Pierhead Light, and other shoals with depths of 22 to 24 feet are scattered over an area located from 2 to 2½ miles north of Sandusky Pierhead Light and from 1½ to 2¼ miles east of Marblehead Light.

Dumping Ground.—About 3 miles northeast of the Sandusky Bay Entrance, or about 3 miles east of Marblehead Light, is a dumping ground in more than 32 feet of water. It is about 1 mile east and west by one mile north and south with a least depth of 30 feet over it.

The navigable waters between the entrance to Sandusky Bay, Marblehead Light and the dumping ground described above, are abundant with fish net stakes.

Point Marblehead, Ohio.—At Point Marblehead, located on the northeasterly termination of the peninsula inclosing Sandusky Bay on the north, is Marblehead Light. About 1 mile westerly along the coast from Marblehead Light is the quarry dock of the Marblehead Stone Div., Standard Slag Co. The main part of the dock extends offshore about 800 feet into 24 feet depth, and affords depths of 17 and 18 feet on both faces along tne outer 300 feet. Two lights, spaced 3 feet apart horizontally, 18 feet above the water, are maintained by the company on the outer edge of the dock.

Coast Guard Station.—Marblehead Coast Guard Station is located immediately west of the Marblehead Stone Div. Standard Slag Co. dock. The Coast Guard Station has a small sheltered basin about 500 feet westerly of the quarry dock affording about 8 feet depth, decreasing to less than 6 feet toward the southerly and easterly sides. Access to the basin is gained through an opening at the northwest corner where the depth is 8 feet.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline of Marblehead, Ohio, starts on the shoreline 1,020 feet 112° from the Marblehead Coast Guard radio mast, and extends about 900 feet 358° to an intake crib in about 20 feet of water. There is a depth of 8 feet of water over the crib and it is not marked.

Automobile and passenger ferry services to Kelleys Island are available from a dock just west of the Coast Guard Station.

Fishing and Hunting Regulations.—See 33 C.F.R. § 206.80 of Rules and Regulations, preceding.

Section IV.—South and West Shores From Point Marblehead to Mouth of Detroit River

Regional Charts: Chart 14820; Chart 14830

Charts 14830, 14842, 14844.—Westerly from Point Marblehead, Catawba Island juts out from the peninsula on the north of Sandusky Bay and terminates in Scott Point. Mouse Island, useful as a radar target, is a small island on the shoal bank about ⅛ mile north of Scott Point. In the bight within a line connecting Point Marblehead and Mouse Island, the water shoals from 18 feet to the shore, with boulders and stony bottom. At a point 2 miles southeast of Scott Point the bank has only 1 foot of water ⅞ mile from shore, with spots of 9 or 10 feet on the outer edge about 1⅛ miles out. (See also description of South Passage in section V.) In this reach are located Lakeside, and East and West Harbors.

Lakeside, Ohio, westerly about 2¼ miles from Point Marblehead, is an open roadstead, but provides a dock extending offshore about 600 feet into 10 feet depth and several smaller docks to the westward extending into lesser depths, where repair and servicing facilities are available for small craft.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake crib of the village of Lakeside, Ohio, is located 4,250 feet 282°

Bridges, etc. Across Sandusky Bay and River

No.	Location and name	Kind	Miles above Sandusky Pierhead Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Sandusky Bay								
1	Bay Point Road Bridge	Highway	*2. 7			†40. 0	17. 8		Fixed; not lighted.
2	ConRail Bridge	Railway	*3. 5			35. 0	6. 7		Single-leaf bascule.
3	Cedar Point Causeway Bridge.	Highway	*3. 7			38. 8	21. 8		Fixed.
4	Johnson Island Causeway Bridge.	do	*3. 7			50. 0	25. 0		Fixed.
5	ConRail Bridge	Railway	7. 7			64. 8	9. 3		Single-leaf bascule.
6	Ohio Route 269 Bridge	Highway	8. 2			65. 0	11. 4		Vertical lift—66.5 feet clearance when open.
7	Ohio Route 2 Bridge	do	8. 5			65. 0	43. 1		Fixed.
7A	Aerial Cable		21. 14				73. 1		
	Sandusky River #								
8	Ohio Turnpike (I-80) Bridge.	do	26. 4			65. 0	40. 0		Twin-fixed.
8a	Aerial Cable		26. 44				60. 7		
9	Ohio Route 20 Bridge	do	31. 0			134. 0	53. 6		Fixed.
10	Norfolk & Western Ry Bridge.	Railway	32. 2			†105. 0	24. 4		Fixed; East channel.
11	do	do	32. 4			†105. 0	24. 9		Fixed; West channel.
12	State Street (Fremont) Bridge.	Highway	32. 8			†50. 0	18. 9		Fixed.
13	Norfolk & Western Ry Bridge.	Railway	33. 4			†110. 0	25. 6		Fixed.
14	ConRail Bridge	do	33. 6			†105. 0	24. 8		Fixed.
15	Tiffin Road (Fremont) Bridge.	Highway	35. 2			†70. 0	37. 0		Fixed; new bridge under constr. just upstream of span.

*Does not cross the primary navigation area of Sandusky Bay. †Approximate.
#Bridges upstream of river mouth are not lighted.

from the Marblehead Coast Guard radio mast. The crib is in about 8 feet of water and is not marked.

East Harbor, westerly 3¾ miles from Point Marblehead, is a shallow bay with an entrance channel between 2 parallel piers, with an angle about midway, extending 1,100 feet from the shore. The northerly shore of the harbor is a State park and recreation area and the waters in the harbor are a public fishing area and game refuge.

Soundings completed in May 1970 indicated controlling depths as follows: 5 feet in the entrance channel; 3 feet in the basin immediately to the east; and 5 feet in the smallboat channel leading in a southerly and then westerly direction which is marked by numerous buoys. This channel is an extension of the entrance channel.

Aids to Navigation.—East Harbor Entrance Light 1, mounted 14 feet above the water on a silver pole, is located at the outer end of the Southeast pier. East Harbor Entrance Light, is located at the outer end of the northwest pier.

West Harbor, 5½ miles northwesterly from Point Marblehead, has two privately maintained entrance channels. Boats drawing up to 3 feet can be accommodated at docks in the harbor with facilities for gasoline, at dockside pumps, service and repair.

Aids to Navigation.—A number of buoys maintained by the East Harbor State Park manager mark the southeasterly small boat channel into West Harbor. West Harbor South Entrance Light, privately maintained 20

feet above the water on a dolphin off the outer end of the south jetty and West Harbor Entrance Light, privately maintained 10 feet above the water on a pile on the end of the north jetty mark the northwesterly entrance channel.

Middle Harbor Shoal, a boulder shoal to the northeast with 2 feet of water over it, is marked at its easterly edge by a buoy located 5,760 feet 085° from West Harbor Entrance Light.

About ¼ mile westerly of Scott Point is the mainland terminus of the automobile and passenger ferry line operating to the islands. There is a depth of about 11 feet at the outer face of the dock. About 400 feet westerly of the ferry dock is a dock of the Port Clinton Fish Co., affording depths of about 4 feet.

The State of Ohio has developed the Catawba State Park on the northwest part of Catawba Island. The park pier is marked by a light located 750 feet 300° from Catawba Cliffs Harbor Light.

Catawba Island buoy is located about 2,500 feet to westward of the headland on the northwesterly side of Catawba Island and about ¾ mile northwest of the entrance to the harbor of the Catawba Cliffs Beach Club. This harbor, on the west side of Catawba Island, consists of a yacht basin formed in a lagoon separated from the lake by a narrow strip of shore through which an entrance channel about 40 feet wide and 5 to 6 feet deep has been cut and revetted with sheet piling. The inner basin has facilities for hoisting small craft as large as 46 feet in length and 20 tons in weight, and marine fuels, at dockside pumps, and service are available. There are depths of 5 to 6 feet along the boat berths on the west side and 3 feet in the easterly part of the harbor. The westerly end of the sheet piling revetting the southerly side of the entrance channel is marked by Catawba Cliffs Harbor Light, a privately maintained beacon surmounted by a fixed light.

Charts 14830, 14842, 14846.—Westward of Catawba Island and inclosed on the west by the shore terminating in the rounding projection called **Locust Point**, is a bight or bay with water shoaling from 24 feet to shore, the distance between the east and west points of the bay being about 12 miles. **Portage River** enters at the head of this bay with the harbor of Port Clinton located at its mouth. A large shallow bank, having 14 feet or less water generally, with a 2-foot spot near the outer edge and other scattered patches of 3 to 10 feet, stretches northeasterly from the shore in the vicinity of Locust Point to a distance of about 5½ miles, approaching to within ¾ mile of the inner edge of Niagara Reef. Strangers should not attempt the passage between these shoals.

Port Clinton Harbor, Ohio.—This harbor is situated at the mouth of the Portage River, about 29 miles southeast of Toledo Harbor entrance. The river enters the lake at the extreme southerly edge of the bight or bay immediately west of Catawba Island. This bight is quite shoal, the depths ranging from 6 feet off the end of the piers to 18 feet about 3¼ miles from shore.

Channels.—The harbor is entered through a dredged entrance channel leading from deep water in Lake Erie between two parallel piers upstream in Portage River for about 0.4 mile to the Monroe Street highway bridge. In 1977, the controlling depth was 9 feet through the entrance channel up to the bridge except for shoaling to 2 feet along the south channel limit in the westerly 900 feet. The channel lakeward of the piers is subject to shoaling.

Aids to Navigation.—Port Clinton Light 2 is maintained on the outer end of the west pier. A radio relay tower and the yellow (brick) waterworks stack serve as good landmarks for mariners. The stack, situated about on the alinement of the west pier, may be used in combination with the Port Clinton Light 2 as a range, until entrance is to be made. A light is located on the east pierhead.

Harbor Facilities.—An automobile and passenger ferry is operated between Port Clinton and Put-in-Bay. Gasoline, at dockside pumps, and service are available.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline of the city of Port Clinton, Ohio, commences on the shoreline 940 feet 229° from Port Clinton Light 2, and extends 1,800 feet 357° to an intake crib in about 7 feet of water. There is a depth of 6 feet over the crib and it is not marked.

A potable water intake commences on the shoreline 1,050 feet 235° from Port Clinton Light 2, and extends 1,000 feet 000° to an exposed intake crib in about 6 feet of water. It is not marked.

Bridges.—A double-leaf bascule-type highway bridge crosses the harbor at Monroe Street, 5,900 feet above the outer end of the pier at the entrance, having an opening with horizontal clearance of 75 feet and clear height of 9.3 feet. Red lights are shown on abutments, protection pier, and draw span; seven lights being visible from either side of bridge, all red when closed, and two (at each end of draw span) showing green when open. The signal to open the draw is one long and one short blast (— —).

About 1 mile farther upstream, the ConRail has a roller-lift bridge with an opening of 109.9 feet and a clear height of 13.5 feet. From 6:00 a.m. to 10:00 p.m. during the navigation season 1 May to 1 December, the bridge will be opened on signal of 3 long blasts and 1 short blast (— — — —). Lights are shown on the lift span piers and on the open end of the roller-lift span.

State Route 2 bridge, completed in 1968 over the Portage River at about mile 3.0, is a fixed highway bridge with a vertical clearance of 30 feet above Low Water Datum and a horizontal clearance of 85 feet.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding, and 33 C.F.R. and § 117.705a and § 117.705b of Rules and Regulations, preceding.

A speed limit of 4 m.p.h. is enforced in the harbor by the city of Port Clinton.

Erie Proving Ground.—There is an Artillery Firing Danger Zone off Camp Perry, about 4 miles west of Port Clinton. It is an irregular area extending northerly and northwesterly into the lake for about 12 miles and having a maximum width of 13 miles.

Caution.—Mariners expecting to navigate in the vicin-

ity of the danger areas described below are cautioned to consult U.S. Coast Guard Ninth District Notice to Mariners for additional information, firing schedules, and changes in restrictions or boundaries.

The areas will be used as an ordnance firing zone and will be governed by the following regulations approved by the Secretary of War, April 26, 1941, as amended:

(a) Area I for artillery firing by Adjutant General State of Ohio [formerly Erie Army (formerly Ordnance) Depot], Port Clinton, Ohio.

(b) Area II for antiaircraft artillery firing from Camp Perry and Locust Point, Ohio.

Danger Zone Regulations.—See 33 U.S.C. 3, published in Certain Laws, preceding, and 33 C.F.R. § 204.187 of Rules and Regulations, preceding.

Caution Area.—Special Use Airspace, as noted in Federal Regulations 14 C.F.R. Part 73 (Federal Aviation Adm., Dept. of Transp.), Special Use Airspace, consists of the area above the surface of the earth as outlined by geographic coordinates and is to be used and controlled for specific purposes in the operation of aircraft. Area R-5502, Lacarne, Ohio, beginning at 41°41'15" N., 83°07'45" W.; to 41°41'17" N., 83°00'00" W.; to 41°35'30" N., 82°54'48" W.; to 41°32'19" N., 83°00'05" W.; to 41°-32'16" N., 83°01'24" W.; to 41°36'54" N., 83°07'45" W.; to the point of beginning may be used for military purposes from the surface to a flight level of 23,000 feet. The using agency is the Adjutant General, State of Ohio, and the time of designation is 0800 to 1600 local time Sat. and Sun. April 1 thru May 31; 0800 to 1600 local time daily June 1 thru July 31; 0800 to 1600 local time Sat. and Sun. August 1 thru Nov. 30; other dates, time and altitudes by NOTAM, published at least 48 hours in advance. The Controlling Agency is the Federal Aviation Administration, Cleveland ARTC Center.

Mariners are cautioned to consult U.S. Coast Guard Ninth District Notice to Mariners for additional information, firing schedules and changes.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline of the Camp Perry installation, commences at a point on the shoreline 4,100 feet 048° from the tower at Camp Perry, Ohio, and extends 4,100 feet 044° to an intake crib in about 13 feet of water. There is a depth of 9 feet over the crib and it is not marked.

From Locust Point to Cedar Point, enclosing Maumee Bay on the east, is a distance of about 14 miles. The shoal border within the 18-foot contour varies from 7.3 miles at Locust Point to 2.5 miles at Reno Beach to 4.7 miles at Cedar Point.

The entrance to the Toussaint River is about 8 miles northwest of Port Clinton. Depths of 2 to 5 feet are available at the approach and entrance to the river. Inside the entrance, there is a depth of about 7 feet for about ¾ mile, thence shoaling rapidly to about one foot. Small-craft facilities are available.

Davis-Besse Power Station.—The cooling tower of the Davis-Besse Nuclear Power Station at Locust Point, Ohio is located approximately 9,100 feet 299° from the mouth of the Toussaint River. The tower is 493 feet high and is lighted.

Outfall Pipeline.—An outfall pipeline of the Davis-Besse Station commences from a point on shore 5,950 feet 325° from the mouth of the Toussaint River and extends 1,400 feet 089° to a crib with 6 feet of water over.

Intake Pipeline.—An intake pipeline commences from a point on shore 6,250 feet 323° from the mouth of the Toussaint River and extends 3,000 feet 051° to a crib with 6 feet of water over. A privately maintained orange and white horizontally banded buoy marks the outer end.

Long Beach, a private harbor for small boats, is located about ¾ mile easterly from the mouth of Turtle Creek. The Long Beach Yacht Club maintains a range of green lights from May 30 to September 1. The front light is displayed on a white pole 10 feet above the water and the rear light mounted 20 feet above water on a white pole, is 200 feet 159° from the front light.

The entrance to the Ward Canal is located about 3½ miles southeasterly from Toledo Intake Crib. Ward Canal East Jetty Light 1 is 10 feet above the water on a green pile and marks the end of the jetty at the entrance to the canal.

The mouth of Cooley Creek, which is located about 2 miles southwesterly from Toledo Intake Crib, forms a small-boat harbor. The Cooley Canal Sportsman Club maintains a series of private lights on the breakwaters at the entrance to the canal.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline of the city of Toledo commences at a point on the shoreline 31,800 feet 168° from Toledo Harbor Light and extends 15,000 feet 055° to the Toledo Intake Crib, a circular building surmounting a cylindrical steel crib, in about 17 feet of water. The crib is marked with the Toledo Intake Crib Light.

A potable water intake pipeline of the city of Oregon, Ohio, commences at a point on the shoreline 15,600 feet 304° from the entrance to the Ward Canal, and extends 6,350 feet 045° to an intake crib in 13 feet of water. There is a depth of 8 feet over the crib and it is not marked.

Charts 14830, 14846, 14847.—Maumee Bay.—Maumee Bay is a large shallow expanse forming the southwest corner of Lake Erie, and having prevailing depths of less than 10 feet. The bay is obstructed by several areas of dumping grounds, with a dredged straight channel leading from deep water in the lake to the mouth of the Maumee River, which forms the harbor of Toledo.

A diked spoil disposal area is on the southeast side of the Toledo Harbor entrance channel at the mouth of the Maumee River. The disposal area, about 242 acres, extends about 0.9 mile into the bay from the shore. A turning area, marked by lights, is on the northwest side of the disposal area.

Toledo Harbor, Ohio.—This harbor is located at the westerly extremity of the lake and includes the lower

7 miles of the Maumee River and the channel about 18 miles long through Maumee Bay to deep water in Lake Erie.

Channels.—A dredged entrance channel leads southwest for about 16.5 miles from deep water in Lake Erie through the shallow water of Maumee Bay to the mouth of Maumee River, thence upstream for about 7 miles. Maumee mooring Basin is on the northwest side of the channel at the mouth of the river, and there are turning basins 2.7, 6.3, and 7 miles above the mouth.

The Federal project depths are 28 feet from deep water in the lake through the entrance channel to the mouth of the river and in Maumee Mooring Basin; thence 27 feet in the river channel to the upstream limit of the project with 20 feet in Riverside Turning Basin, 2.7 miles above the mouth; thence 27 feet in the turning basin 6.3 miles above the mouth; and thence 18 feet in the turning basin at the head of the project, 7 miles above the mouth. (See Local Notice to Mariners and latest edition of charts for controlling depths.)

No distinct bars form in the dredged channel, which is, however, subject to considerable fill along its sides each year. Depths in Maumee Bay outside of the improved channel are less than 10 feet and navigation is possible for small boats only. In the lake, dipper dredge operations have thrown up a ridge of earth along the edges of the channel. This ridge may rise as much as 3 feet above the natural lake bottom and, in order to avoid striking, deep-draft vessels should pass the traffic lighted buoy and enter the channel between the buoys at the lakeward end.

Upstream of the improvement in the Maumee River, the channels are irregular and of uncertain depths, with numerous shoals and rock bars. Boats drawing less than 5 feet can usually pass as far as Perrysburg, about 7 miles above Toledo.

Fluctuations of Water Level.—In addition to the surface fluctuations which affect Lake Erie somewhat uniformly, as noted in the "General Description" of this lake, sudden abnormal changes due to wind are of frequent occurrence at this port. The observed wind produced fluctuations, in combination with prevailing high or low water, range between extremes of 8 feet above and 7 feet below Low Water Datum. Ice jams near the mouth of Maumee River have raised the water in the river as high as 12 feet above Low Water Datum.

Mariners are cautioned that when water levels are above Low Water Datum, bridge clearances are correspondingly reduced. The Toledo-Lucas County Port Authority, telephone (419) 243-8251, will measure the height of masts upon request.

Aids to Navigation.—The approach to Maumee Bay Channel is marked by Maumee Bay Traffic Lighted Buoy in 20 feet of water, 39,350 feet 337° from West Sister Island Light. The straight channel bears 237°45′ and is marked by range lights and buoys. On the mainshore at the mouth of the river is the Manhattan range of lights, marking the axis of this channel. Toledo Harbor Light is 8 miles in from the outer end of the straight channel and 400 feet northwesterly from its axis; fog diaphragm horn and a marker radiobeacon are operated at this station. A power cable extends from Toledo Harbor Light 290° to the shore.

Harbor Facilities.—The Maumee River project area through the city of Toledo has been developed extensively for deep draft navigation along both shores. Facilities of almost every nature are available for deep-draft vessels and small craft.

Dry Docks.—The American Ship Building Co. has two dry docks on the east side of the Maumee River about ¾ mile above the Norfolk & Western Ry. bridge. Both docks have timber bottoms, concrete portals and sides, with steel gates.

	Dock No. 1	Dock No. 2
	Feet	*Feet*
Clear length inside at top	545	650
Length on bottom over keel blocks	505	601
Width on sill	72	82
Width at top of keel blocks	80	83
Clear width inside at top	101.5	100
Depth over sill	13	14.6

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Toledo, Ohio, is contained in the Port Series No. 44 (Revised 1972) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Water Level Gage.—A National Ocean Survey Water Level Gage House is located near the west shore line on the Corps of Engineers' property, adjacent to the U.S. Coast Guard Station, Bay View Park, Toledo, Ohio. There is a submerged intake pipe at a depth of 12 feet extending approximately 300 feet riverward from the gage house. The end of the intake pipe is located about 500 feet 067° from Manhattan Front Range Light. Mariners should avoid all movement of deep draft vessels or the dragging of anchors in the vicinity of the water intake pipe.

Water Level Broadcasts.—Upon request, the Toledo Coast Guard Station will broadcast water level information in the following format:

"This is the U.S. Coast Guard Toledo Station. The National Ocean Survey water level gage at this station now reads (plus) (minus) ___ inches (above) (below) Low Water Datum. This is the U.S. Coast Guard Toledo Station out."

Coast Guard Station.—Toledo Coast Guard Station is located in Bay View Park on the northwesterly side of the river near its mouth.

National Weather Service Warning Display Station.—Signals are displayed from a flagstaff near the waterfront on the west bank of the Maumee River on the grounds of the U.S. Coast Guard in Bay View Park.

Navigation Regulations.—See 33 C.F.R. § 162.150 of Rules and Regulations, preceding.

Local Harbor Regulations.—Speed in harbor. No person shall operate any vessel over 100 feet in length in the harbor at a speed greater than six (6) miles per hour. Vessels under 100 feet in length shall not be operated at an excessive rate of speed or in a manner to cause a wake, so as to endanger any person or property of any person, having due regard to other boats, or persons, or other objects in or on such waters.

Copies of the harbor regulations may be obtained from City of Toledo, Division of Streets, Bridges and Harbor, 1189 West Central Avenue, Toledo, Ohio 43610.

* * * * *

Article IV—Bridge Regulations

Section 22-4-1. Signals on Approaching Bridges.

1. The movable spans of all bridges over the Maumee River in the City of Toledo shall be opened for passage of vessels during all hours of the day or night upon signal given by any vessel desiring to pass through any such bridge; namely, three (3) long blasts of a horn or whistle, such signal to be given when such vessel is at a sufficient distance from such bridge to enable it to stop if for any reason such bridge cannot be opened. Upon receiving a signal from a vessel desiring to pass through the bridge, the bridge operator, if such bridge can be promptly opened, shall answer by one long and one short blast from the bridge whistle which will indicate that such vessel may proceed toward the bridge, and such vessel shall acknowledge the bridge signal by one long and one short blast of the horn or whistle.

2. If for any reason the bridge operator will be temporarily delayed in opening such bridge, he shall blow a check signal of three (3) short blasts.

3. If for any reason, the bridge operator cannot open such bridge in response to proper signals so to do, he shall blow a warning or danger signal from the bridge whistle of five (5) or more short blasts. (Ord. 719-55, Dec. 28, 1955.)

4. No bridge owners shall obstruct, or permit or cause to be obstructed the passage of any vessels by permitting trucks, automobiles, railroad cars, locomotives or other obstructions to remain upon or across their moveable bridge for longer than fifteen (15) minutes to the hindrance or inconvenience of vessels signaling to pass through any such bridge. No bridge owner shall fail, at the end of each fifteen (15) minute period of obstruction of vessel passage, to cause such trucks, automobiles, railroad cars, locomotives or other obstructions to be removed for sufficient time to allow passage of all such vessels.

This section does not apply to obstruction of vessel passage caused by a continuously moving through train or by circumstances wholly beyond the control of the bridge owner, but applies to other obstructions, including without limitation, those caused by pavement or track maintenance, stopped trains or trains engaged in switching, loading, unloading or shift change.

Upon the filing of an affidavit or complaint for violation of this section, summons shall be issued to the bridge owner, which summons shall be served on the owner or the agent of the owner within the City of Toledo.

Section 22-4-2. Vessels Approaching Bridges. It shall be unlawful for any master or person in charge or in possession of any vessel navigating the harbor to approach any nearer to any of the bridges than to a point at a distance from such bridge within which such vessel can be stopped without colliding with such bridge unless he has received the approval signal of one long and one short blast. (Ord. 719-55, Dec. 28, 1955.)

Section 22-4-3. Bridges To Be Lighted. All bridges over the Maumee River in the City of Toledo shall be lighted in accordance with the regulations of the United States Coast Guard and lights shall be visible on a dark night with clear atmosphere at least one nautical mile or about 2,000 yards. (Ord. 719-55, Dec. 28, 1955.)

Section 22-4-4. Vessels Passing Through Bridges. All vessels navigating the harbor when passing any bridge shall be moved as expeditiously as is consistent with a proper movement in the river and shall not be anchored or fastened to interfere with the opening or closing of any bridge. (Ord. 719-55, Dec. 28, 1955.)

Section 22-4-5. One Vessel Tow. It shall be unlawful for any person to cause any vessel to tow more than one vessel at a time through any movable bridge in the harbor, providing that this shall not be construed as applying to scows or yachts. (Ord. 719-55, Dec. 28, 1955.)

Section 22-4-6. Passing on After Signal To Open. When any bridge operator shall be about to open the span of any bridge within the limits of the City he shall give notice to land traffic of his intention to open such movable span by raising a flag, ringing a bell, or other signal or flashing a red light. After such notice is given, no person shall walk, ride or drive any vehicle upon such movable span while such bridge operator is opening or closing the same. (Ord. 719-55, Dec. 28, 1955.)

Section 22-4-7. Standing on Movable Span While Opening or Closing. It shall be unlawful for any unauthorized person or persons to stand or remain on any movable span in the harbor when the same is being opened or closed. (Ord. 719-55, Dec. 28, 1955.)

Section 22-4-8. Lounging on Bridge, Etc. It shall be unlawful for any person or persons to assemble upon or about any of the bridges, and then and there lounge or loiter, and conduct himself, herself or themselves in a manner annoying to persons passing by, or to the distress of any other person or persons whatsoever or to commit any indecent or disorderly act while stopping upon or about said bridges. (Ord. 719-55, Dec. 28, 1955.)

Section 22-4-9. Duty of Bridge Operators. It shall be the duty of the bridge operator in all cases to report to his immediate superior any infraction of this article. (Ord. 719-55, Dec. 28, 1955.)

Section 22-4-10. Penalty. Any master, owner or person in possession, charge or control of any vessel, any owner or operator responsible for operation of a moveable bridge or any other person, firm or corporation who shall violate any of the provisions of this article shall be deemed

Structures Across the Maumee River at Toledo, Ohio

No.	Location and name	Kind	Miles above mouth of river	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Submerged tunnel	Sewer	0. 94						6 foot dia. Approx. depth 39.7 feet.
1A	Aerial cable	Electric	1. 00				154. 0		
2	Submerged pipeline	Petroleum	1. 04						8 inch dia. Approx. depth 32½ feet.
3	do	do	1. 06						12 inch dia. Approx. depth 35½ feet.
4	do	do	1. 06						16 inch dia. Approx. depth 35½ feet.
5	do	do	1. 07						22 inch dia. Approx. depth 35½ feet.
6	do	do	1. 07						12 inch dia. Approx. depth 35½ feet.
7	Aerial cable	Electric	1. 09				129. 0		132.5 feet over channel.
8	do	do	1. 11				146. 0		
9	Submerged cables	Commo. and signal.	1. 12						Approx. depth 32 feet (2 cables).
10	Submerged cable	Power	1. 12						Approx. depth 32 feet.
11	Terminal RR. bridge (Ironville).	Railway	1. 12	145	143		22. 2		Electric power. Swing. See note 1.
12	Submerged pipeline	Petroleum	1. 13						8 inch dia. Approx. depth 30 feet.
14	Submerged pipeline	Gas	1. 22						16 inch dia. Approx. depth 35 feet.
15	Submerged cable	Telephone	1. 69						Approx. depth 35 feet.
16	do	Commo	1. 82						Do.
17	Norfolk & Western Ry bridge.	Railway	1. 87	136	145		20. 1		Electric power. Swing. See note 1.
18	Submerged cable	Power	1. 89						Approx. depth 35 feet.
19	Submerged pipelines	Petroleum	1. 94						6 inch dia. (2 each) Approx. depth 35 feet.
20	Submerged tunnel	Water	2. 53						72 inch dia. Approx. depth 114 feet.
21	Submerged pipelines	Petroleum	2. 80						8 inch dia. Approx. depth 33 feet (2 each).
22	Submerged pipeline	do	2. 90						8 inch dia. Approx. depth 33 feet.
23	do	do	3. 10						16 inch dia. Approx. depth 33 feet. Variable 9–30 feet.

See footnotes at end of table.

Structures Across the Maumee River at Toledo, Ohio—Continued

No.	Location and name	Kind	Miles above mouth of river	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
24	Submerged cable	Commo	3.36						Approx. depth 33 feet.
25	Submerged cables	Commo. power control.	3.36						Approx. depth 37 feet (3 cables).
26	Craig Memorial bridge	Highway	3.37			200.0	(**)		Electric power. Bascule. See note 1.
27	Submerged pipeline	Water	3.72						72 inch dia. Approx. depth 50 feet.
28	Submerged cables	Power, commo. control.	3.98						Approx. depth 31 feet (3 cables).
29	ConRail bridge	Railway	4.00	115	115		17.7		Electric power. Swing. See note 1.
30	Aerial cable	Electric	4.12				140.0		
31	Submerged cable	Power	4.35						Approx. depth 37 feet.
32	do	Commo	4.36						Approx. depth 31 feet.
33	do	do	4.36						Approx. depth 29 feet.
34	do	do	4.36						Approx. depth 31 feet.
35	Submerged cables	Commo. power.	4.36						Approx. depth 31 feet (2 cables).
36	do	Commo	4.36						Approx. depth 31 feet (5 cables).
37	Cherry St. bridge	Highway	4.37			200.0	(*)		Electric power. Bascule. See note 1.
38	Submerged pipeline	Gas	4.38						20 inch dia. Approx. depth 32 feet.
39	do	do	4.38						20 inch dia. Approx. depth 29 feet.
40	do	do	4.38						10 inch dia. Approx. depth 32 feet.
41	do	do	4.39						Do.
42	do	Water	4.43						30 inch dia. Approx. depth 32 feet.
43	Anthony Wayne bridge	Highway	5.00			747.0	(†)		Fixed. See note 1.
44	Submerged cables	Commo	5.83						Approx. depth 30 feet (2 cables).
45	ConRail bridge	Railway	5.87	115	115		17.3		Electric power. (Swing) See note 1
46	Aerial cables		5.87				109.0		See note 3.
47	Submerged pipeline	Sand	6.66						20 inch dia. Depth variable 9–30 feet.

See footnotes at end of table.

Structures Across the Maumee River at Toledo, Ohio—Continued

No.	Location and name	Kind	Miles above mouth of river	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
48	M. V. DiSalle bridge	Highway	6.70	110	110	-------	45.0	-------	Fixed.
49	Submerged cable	Commo	9.00	-------	-------	-------	-------	-------	Approx. depth 10 feet.
50	Terminal RR. bridge (upper).	Railway	11.50	110	110	-------	53.5	-------	Swing. Hand power. See note 1.
51	Aerial cable	Electric	11.55	-------	-------	-------	100.9	82.2	
52	Ohio Turnpike bridges	Highway	11.60	110	110	-------	37.0	-------	Fixed (2 bridges).
53	Perrysburg-Maumee bridge.	do	14.44	100	100	-------	29.0	-------	Fixed.

Whistle Signal for Opening Draws, 3 long (— — —). Answered from bridge by 1 long and 1 short blast if draw is to be opened and the vessel shall acknowledge the bridge signal by 1 long and 1 short blast of the horn or whistle. For other signals see article IV below.

*Double leaf bascule; headroom varies from 31.3 feet in the center to 21 feet at the sides of the span.

**Double leaf bascule; clearance when closed ranges from 44.1 feet at midpoint to 38 feet at main piers.

†A high level suspension bridge; Vertical clearance of 108 feet (32.92 meters) on the center line of the 400-foot channel, reducing to 104 feet (31.70 meters) at the channel lines and 97 feet (29.56 meters) at the harbor lines.

NOTE 1.—Bridges shall be lighted in accordance with regulations of the U.S. Coast Guard, and lights shall be visible on a dark night with clear atmosphere at least 2,000 yards.

NOTE 3.—Physical clearance 5 feet more than safety clearance shown. ConRail

guilty of a misdemeanor of the fourth degree as set forth and provided for in Section 17-1-111 in the case of an individual and Section 17-1-113 as to organizations.

The Ottawa River (Ohio-Michigan) empties into Lake Erie about 3½ miles north of the mouth of the Maumee River, and between the mouth and the first bridge at Summit Street having a vertical clearance of 14 feet, about 2 miles upstream, provides the base of operations for small boats having drafts of from 2 to 4 feet. In the reach are numerous docks, including those of the Ottawa River Yacht Club. Gasoline is available at dock side pumps.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 58, Monroe county.

R 281.758.3. Ottawa river; slow—no wake speed.

3.(c) On the waters of the Ottawa river, section 3, town 9 south, range 8 east and section 34, town 8 south, range 8 east, from the Michigan-Ohio state line to its confluence with north Maumee Bay. * * *

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 58, Monroe county.

R 281.758.3. Shantee creek; slow—no wake speed.

3.(b) On the waters of Shantee creek, section 4, town 9 south, range 8 east, and section 33, town 8 south, range 8 east, from the Michigan-Ohio state line to its confluence with Halfway creek. * * *

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 58, Monroe county.

R 281.758.3. Halfway creek; slow—no wake speed.

3.(a) On the waters of Halfway creek, sections 32 to 34, town 8 south, range 8 east, from the Sudar avenue bridge, easterly to a line drawn from the easternmost point of land in the northwest ¼ of section 34 to the southernmost point of Indian island thence to the easternmost point of land in the southeast ¼ of section 34. * * *

Charts 14830, 14846.—From Maumee Bay to the mouth of the River Raisin, the coast is low and wooded. The 18-foot contour varies from 9 miles offshore at Toledo to 3 miles offshore at Monroe, Michigan. The Ohio-Michigan State line is about 2¾ miles north of the mouth of the Maumee River.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 58, Monroe county.

R 281.758.2. Allens Cove creek and canals and channels; slow—no wake speed.

2. On the waters of Allen's Cove creek and all natural and artificial canals and channels in the city of Luna Pier. * * *

Toledo Beach, Mich.—This small-craft harbor is about 6.3 miles northwest of Toledo Harbor Light. The entrance channel is marked by a private 290° lighted range, and the ends of the breakwaters are marked by private lights. In July 1977, depths of 6 feet were reported in the entrance channel.

Otter Creek Harbor, Mich., is about 4 miles southwest of Monroe. The channel, with controlling depths of 2 to 3 feet, limits the use of the harbor to small craft. The entrance, 25 to 30 feet wide, between two short piers, is marked by private range lights located on the southerly pier. The front light is 12 feet above the water, on a white pole 6¾ miles 328° from Toledo Harbor Light. The rear light is 22 feet above the water, on a white pole 75 feet 284° from the front light. Gasoline is available at dockside pumps.

Bolles Harbor, Mich.—This small boat harbor is located at the mouth of **La Plaisance Creek,** about 2¾ miles southwesterly from the mouth of the River Raisin.

Channels.—A dredged entrance channel leads northwesterly from Lake Erie through **La Plaisance Bay** to the mouth of La Plaisance Creek, thence upstream for about 0.8 mile. A jetty and spoil berm extend about 1,700 feet lakeward from the east side of the mouth. In 1976, the controlling depths were 1 foot in the approach from the lake through the entrance channel, thence 3 feet in the creek for 0.4 mile, thence 2 feet to the head of the project.

In 1977, a diked disposal area enclosing the berm was under construction on the east side of the entrance channel.

Aids to Navigation.—The entrance channel is marked by lights and buoys.

Marine Service.—Gasoline is available at dockside pumps.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 58, Monroe county.

R 281.758.6. LaPlaisance creek; slow—no wake speed.

6. On the waters of LaPlaisance creek, Monroe township, Monroe county, from LaPlaisance road, private claims 416 and 423, downstream to the outer pierhead. * * *

Monroe Harbor, Mich.—The harbor of Monroe is within the mouth of the **River Raisin,** which flows into the west end of Lake Erie, about 15 miles north-northwest of the mouth of the Maumee River. Two lighted stacks, 816 feet high, are prominent near the mouth of the River Raisin.

Channels.—A dredged entrance channel leads from the deep water in Lake Erie to the mouth of the River Raisin, thence to a turning basin with its upper end 1.5 miles above the mouth. In 1976, the controlling depth was 14 feet at midchannel in the entrance channel and upstream to the turning basin with 12 to 14 feet in the basin except for shoaling to 7 feet on the south and west edges. The channels in this harbor are subject to extensive shoaling from waterborne silt and littoral drift of Lake Erie.

Aids to Navigation.—Range lights mark the alinement of the dredged channel. The front light is shown on a skeleton tower located on the south bank of the river about 4,400 feet from the mouth. The rear light is shown on a skeleton tower, distant 2,250 feet 291°45′ from the front light.

A lighted buoy is located about 5.6 miles southeasterly from the front range light, near the point of departure. The dredged channel in the lake is well marked with lighted and unlighted buoys.

Two lighted stacks, 816 feet high, are prominent on the south side of the river mouth.

Harbor Facilities.—The Port of Monroe Authority has built about 1,300 feet of steel and concrete wharf on the southeast and south sides of the turning basin, with facilities for handling merchandise. From the turning basin to Monroe, a distance of about 3,800 feet, the controlling depth in the river is not more than 6 feet.

Aerial Cables.—An aerial power transmission line of the Detroit Edison Company, with minimum free vertical clearance of 161.3 feet, crosses the River Raisin about 3,200 feet upstream from the river mouth.

Bridge.—A fixed highway bridge, carrying the Detroit-Toledo Freeway across the River Raisin, is located 2.10 miles above the mouth of the river. There are three spans over the river proper with the middle span providing 151.5 feet clear width between the piers and 23 feet overhead clearance.

Submarine Pipeline.—A submarine gas pipeline crosses the River Raisin about 2½ miles above the river mouth.

Navigation Regulations.—See 33 C.F.R. § 162.145 of Rules and Regulations, preceding.

From the mouth of the River Raisin, the coast trends northerly about 4 miles and then easterly about 2 miles, where a narrow peninsula called **Stony Point** extends about ½ mile to the south. In the bight thus formed, called **Brest Bay,** the 18-foot depth curve is 1 to 3 miles offshore.

At **Sandy Creek,** about 2 miles north of Monroe Harbor, a small-boat harbor has been developed with Sterling State Park on the south side at the entrance to the creek. A private 303½° lighted range marks the entrance channel. In August 1977, depths of 3 to 4 feet were reported in the entrance with 4 feet alongside the piers. Shoaling was reported on the south side of the entrance.

At **Stony Creek,** about 4 miles north of Monroe Harbor, a small-boat harbor has been developed. A private lighted range marks the entrance channel between spoil banks. In 1977, it was reported that a submerged pipeline covered 1 foot, crosses the entrance to the creek limiting the harbor to small craft.

Wreck.—The schooner **General Franz Spiegel** foundered in July 1903 in 24 feet of water 4¾ miles northeasterly of the River Raisin entrance and 9,500 feet southeasterly from Stony Point. The wreck was cleared to 17 feet depth in July 1904.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A water intake pipeline of the City of Monroe extends 5,580 feet 134° from the shoreline just north of Stony Point to a crib having a least depth of 14 feet over it. The crib is not marked.

On the east side of Stony Point, the 18-foot curve is about 0.6 mile offshore, increasing to 3.8 miles off at Swan

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Creek. From Swan Creek to **Pointe Mouilee**, the depths are generally less than 18 feet except for the improved channels leading to the Detroit River.

Water Supply Intake.—A 2,700-foot long 160-foot wide water intake channel of the Enrico Fermi Power Plant is located 6¼ miles northeast of the River Basin entrance at Monroe. 700-foot rock dikes are located on either side of the intake channel with two intake lights showing fixed white on wood poles located 33,200 feet 244° from Detroit River Light.

Swan Creek.—This creek is located about 3¼ miles north of Stony Point, Michigan. The entrance is about 75 feet wide, expanding inside to more than 1,300 feet and having a 250-foot width at a point 2.0 miles upstream from the Lake Erie shoreline. Private range lights, with the rear light about 100 feet 309° from the front light, are on the north side of the creek entrance. Inside the entrance, a series of steel pipes marks the north limit of the channel. In August 1977, a controlling depth of 2 feet was reported in the entrance channel.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 58, Monroe County. **R 281.758.1.**—Swan creek and canals; slow—no wake speed.

1. On the waters of Swan creek and all natural and artificial canals and channels in the village of Estral Beach, Monroe county. * * *

Detroit River Light, marking the entrance to the river, shows group flashing white; an air diaphragm foghorn is operated at this station. The channels leading up the river are well marked, as shown by the chart, and are described under the heading of the Detroit River.

Dumping Grounds Regulations.—See **33 U.S.C. 419**, published in Certain Laws, preceding, and **33 C.F.R. § 205** of Rules and Regulations, preceding.

Disposal Area.—In 1977, an irregularly-shaped diked disposal area was under construction about 2½ miles west of Detroit River Light.

Dumping Ground East of Detroit River Light.—A dumping area 4,500 feet by 3,300 feet is located east of the Detroit River Light in Canadian waters. It is not marked.

Section V.—Island Region in West End of Lake Erie

Regional charts: Chart 14820, Chart 14830

Practically the entire cross-section of Lake Erie for 25 miles westerly from a line between Point Marblehead on the south shore and Point Pelee on the north shore is rendered foul by a group of islands and shoals. The main vessel course for large carriers is through Pelee Passage in the north part of the area, but to the southward other passages of limited capacity are also available.

The International Boundary between the United States and Canada extends through this area in a series of straight lines bearing from the east into the northwest. It is well marked with buoys painted orange and white horizontally banded stripes and alphabetically lettered through "H", proceeding from the east into the northwest.

Charts 14830, 14842, 14844.—South Passage and Vicinity.—Northward of the south mainland coast at Marblehead and Catawba Island, Ohio, is the South Passage through the island group, with Kelleys Island, South Bass Island, and Green Island on its northerly side and with numerous shoals obstructing it, as detailed below. A draft of about 16 feet may be safely carried through the passage. The vessel courses to eastward from the passage, branch out at a point 1½ miles north of Marblehead Light, and those to westward, at a point one mile south of Green Island Light.

Submarine Cables.—There are three submarine power cables on the natural lake bottom in the South Passage between Lakeside, Ohio and Kelleys Island, Ohio.

Kelleys Island, Ohio, is about 3¼ miles north from the shore at Marblehead, the deep channel between the two being fully 2¾ miles wide. The island is nearly 3 miles in extent east and west by about 2 miles north and south, with a narrow point extending about a mile farther at the northeast corner. A buoy marks the edge of the offshore bank about 1,600 feet easterly of the northeast point of the island. To the west of this point in the north shore there is an open bay with deep water ¼ mile off. The east side of the island should be given a berth of ⅝ mile on account of a rocky bank along it. The other shores should not be approached nearer than ¼ mile. The Kellstone, Inc. (former Kelleys Island Co.) dock is located on the west side of the island. Neuman Ferry Landing is located on the south side. The Kelleys Island and Sandusky telegraph cable runs from the quarry dock at Marblehad to the docks on the southwest shore of the island.

A small-boat harbor has been established at the east end of the bay on the south side of Kelleys Island. The channel leading to a completely enclosed inner basin is protected by stone jetties. The south jetty is marked at the outer end by a light and the north jetty is also marked by a light. The inner basin, about 700 by 100 feet, has docking facilities and a controlling depth of 8 feet.

Potable Water Intake.—See **42 U.S.C. 264**, published in Certain Laws, preceding, and **21 C.F.R. § 1250.93** of Rules and Regulations, preceding. A potable water intake crib to provide water to Kelleys Island is located 1,780 feet 179° from the tank north of the post office on Kelleys Island. The crib is in about 9 feet of water and is not marked.

In the area west of **Carpenter Point**, the most westerly extension of Kelleys Island, there are rocky spots having less than 18 feet of water on them. A rock about 25 feet by 10 feet in size, with smooth sides and rounding top, having a least depth of 12 feet, is located in 20 feet of water about 2,000 feet northwesterly from Carpenter Point; a lighted buoy is moored close southwestward of the rock.

American Eagle Shoal has 10 feet least water on it at a point 1⅝ miles west of Carpenter Point; with a 15-foot spot about 4,500 feet west of Carpenter Point.

South Shoal is the southwest end of the shoal group on the northeast side of the South Passage sailing line, 2¾ miles westerly from Carpenter Point and 2¼ miles easterly from the north point of Mouse Island.

Sweeping during July 1910, using the Lake Survey steamer Surveyor, revealed the presence, in the South Passage, of numerous projecting obstructions believed to be the remains of old pound-net stakes. Several of these, with 18 feet or less water over them, were located directly on or near the sailing course, 2.2 miles southeast from South Shoal, the least depth found being 13 feet. There is 23 or 24 feet of water over the natural bottom from which these stakes project.

Scott Point Shoal, westward from South Shoal and on the southwest side of the vessel course, is rocky and has a least depth of 11 feet at its northeast end, where it is marked by a lighted buoy; thence it extends ⅞ mile toward Mouse Island and to within about ⅝ mile from the latter. In a northwest direction from Scott Point Shoal, and about one mile north of Mouse Island, is **Mouse Island Reef**, with a least depth of 9 feet. **Starve Island Reef**, with 7 feet of water on it, is on the opposite or northeast side of the vessel passage; it is marked off its west side by a lighted buoy. The reef is one mile southeasterly from **Starve Island**; the latter is small and lies about ⅝ mile off the southeast shore of South Bass Island, on a shoal rocky bank reaching about ½ mile farther, with only 8 feet at its outer end. There is ½ mile width of deep water between these two reefs.

South Bass Island, Ohio, is 2½ miles north of Mouse Island and 5 miles northwest of Kelleys Island. Its maximum reach, northeast and southwest, along its southeast face, is about 3½ miles, and the greatest width midway of its length is nearly 1½ miles. Telegraph and telephone cables connect the south end of the island and Scott Point of Catawba Island. On the southeast side, shoal water extends off from ¼ to ½ mile, except for the greater extent at Starve Island. The westerly face of the island is deep-to. South Bass Island Light is on the northeasterly side of the South Passage and on the southwesterly point of South Bass Island.

Put-In-Bay, Ohio.—This harbor, a semicircular inlet on the northerly side of South Bass Island, is used principally for fruit shipments and excursion business.

Channels.—From natural depths of 14 feet in the bay, a dredged channel leads westward along the piers on the south side of the bay. In 1975, the controlling depths were 14 feet in the eastern part of the channel and 8 feet in the western part.

Aids to Navigation.—The channel is marked by unlighted buoys. A rock shoal with depth of 10 feet, marked by a buoy, lies in the northeast end of the harbor at a location about 2,000 feet 337½° from Perry Monument. From **Peach Orchard Point**, the west point of Put-in-Bay Harbor, a shoal reaches northeast 1,200 feet and is marked by a lighted buoy which must be rounded outside in entering the bay.

Gibraltar Island is a small bold islet in the bay just east of Peach Orchard Point, with shallow water shoreward from it.

Perry Memorial Monument, at Put-in-Bay, commemorating Perry's victory in the naval battle of 1813 in this vicinity, is located at about the middle of the low, narrrow neck of land forming the southeastern shore of the bay; latitude 041°39′15″, longitude 082°48′41″. The monument rises to a total elevation of about 356 feet above lake level, forming a conspicuous landmark from the lake. It consists of a Doric column of white granite, with diameter of 45 feet at the base and 35 feet at the neck below the cap, which latter is 47½ feet square. Surmounting the granite shaft is a steel and bronze bowl on 8 legs, covered by frosted glass having a diameter of 19 feet and a convex bulge 3 feet high above the bowl. Two white lights operating simultaneously, visible 25 miles, are mounted 31 feet apart on the northerly and southerly corners of the penthouse roof, 335 feet above water. The light sectors overlap between 070° to 130° and 250° to 310°, which may present two lights to the mariner when observed in these sectors at close proximity.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake crib to provide water in Put-In-Bay is located 3,100 feet 160° from the National Weather Service Warning Display Station at Put-in-Bay. The crib is in about 9 feet of water and is not marked.

Anchorage regulations.—See 33 C.F.R. 110.1 and 110.84a of Rules and Regulations, preceding.

Green Island, Ohio, is one mile west of the west extremity of South Bass Island, is of small area, rocky and wooded. A light on its west end is 309½°, 1¾ miles from South Bass Island Light. A shoal extends ¼ mile from the east end of Green Island, which is otherwise bold.

Niagara Reef, Ohio, is a rocky patch extending about ⅝ mile east and west and ½ mile north and south, with 3 feet least depth, marked on its northeast side by a lighted buoy. From the buoy, Green Island Light bears 105½°, distance 5⅝ miles, and the northeast end of West Sister Island bears northwest, distant 8½ miles. Strangers should not attempt the passage south of Niagara Reef owing to the foul ground reaching out from the mainland, leaving a deep channel about one mile wide. Attention is also invited to the firing zone of the Erie Proving Ground, lying shoreward of Niagara Reef and West Sister Island and described relative to the Catawba Island-Locust Point area.

Chart 14830.—West Sister Island, Ohio, the most westerly of the island group, lies 8½ miles northerly from the mainland at Locust Point. It is ⅝ mile long northeast and southwest and ⅓ mile in maximum width, and has bold shores except for a narrow spit with one foot of water, extending ⅓ mile to the southeast. A light is located on the southwest extremity, from which Green Island Light is 14 miles 116¾° and Toledo Harbor Light is about 11½ miles 278½°.

Charts 14830, 14842, 14844.—Middle Passage.—Kelleys Island Shoal lies northeast of Kelleys Island. There is a narrow channel of 18 feet or more depth between the northeast area of the Kelleys Island and the southeast end of the shoal. The northeast end of the shoal is about 2½ miles

from the island. The least depth on the shoal is 2 feet, with 8 to 10 feet prevailing. Kelleys Island north side buoy is moored in 24 feet of water on the northwest side of the shoal.

Gull Island Shoal is 1⅞ miles northwest of Kelleys Island Shoal and 2¼ miles northerly of **Kelleys Island,** The shoal extends 1⅜ miles northeast from the buoy moored on the south side of the shoal. The depths diminish to exposed rocks on the southwest end, which is ⅝ mile wide. Between the north end of the shoal and Middle Island there is a deep vessel passage ¾ mile wide.

Middle Island, Ont., about 1.6 miles north of **Gulf Island Shoal,** is about ¾ mile long east and west, terminating at its west end in a narrow ridge, and its width north and south is about 1,000 feet.

Wreck.—A partially submerged wreck of an old barge approximately 50 feet long, is located off the western end of Middle Island, Ont., in approximate position 41°40′55″ N., 82°41′15″ W. The wreck lies in about 6 feet of water with the exposed portion about 9 feet above water.

Ballast Island, Ohio.—From the northeast point of South Bass Island, shoal water extends ⅞ mile to Ballast Island, but a channel 390 feet wide with 8 feet of water is available across this bank, about ¼ mile south of Ballast Island. The south edge of this channel is marked by two buoys, 2,700 feet 171° and 2,650 feet 224° from Ballast Island Light. The north face of Ballast Island is deep-to. Ballast Island Light, on the northeast corner of the island forms a leading mark in approaching from the east; the light is obscured from 194° to 250°.

Middle Bass Island, Ohio, lies with its south end about ½ mile from the adjacent northeast projection of South Bass, and its main body is about 1½ miles long north and south. At the northeast end, however, a narrow peninsula projects northeasterly 1⅜ miles, with a shoal spit running ⅝ mile beyond its outer end and shallow water along its sides from ¼ to ⅜ mile off. The 18 foot contour at the easterly limits of the shoal spit is marked by a buoy. The maximum width of the island near its north end is about 1¼ miles, and the minimum width near the south end about ½ mile. About ⅛ mile off the northwest corner of Middle Bass and joined by a reef with a least depth of one foot of water over it, is **Sugar Island,** ⅜ mile east and west by ⅛ mile north and south. A 10-foot shoal is found ½ mile northeast of Sugar Island, on a line to the southeast point of North Bass Island. The east, south, and west sides of Middle Bass are deep to within ¼ mile.

Rattlesnake Island, Ohio, is one mile southwesterly from the west extremity of Middle Bass and its east end, which is shoal for about 1,000 feet off, is north of the west extremity of South Bass. It extends thence ⅝ mile northwesterly, further prolonged ¼ mile by a spit and small islet at the west end. The other shores are celan.

Wreck.—The dredge **Toledo** was sunk November 19, 1924, in about 35 feet of water about 6,000 feet northwesterly from the northwest end of Rattlesnake Island and about 2⅞ miles northerly from Green Island Light, near the Put-in-Bay course. An examination by sweeping in 1942 showed a least depth of 23 feet over the wreck. It is not marked.

North Bass Island, Ohio, about one mile north of Middle Bass Island, is 1½ miles across at the south end, decreasing to ¾ mile at the rounding north end, and is 1⅛ miles in extent north and south. The shores are generally shoal to ⅜ mile off, but off the west side a broad rocky reef with 5- to 12-foot depths, marked by a buoy at its outer edge, reaches westward 1¼ miles, its southerly limits being about on prolongation of the south shore line of the island. The northeast edge of the shoal area around North Bass Island is marked by a buoy.

North of North Bass Island, and lying 1⅛ to 2¼ miles from it, is a group of rocky shallow spots having scattered depths of from 10 to 14 feet on them. The southwesterly edge of these shoal spots is marked by a buoy about ¾ mile north and by a buoy about 2 miles northwesterly respectively of North Bass Island. These shoals are practically within north and south lines extending from the most westerly and easterly tangents of North Bass Island, the most easterly bearing about northerly from the east tangent. The deep water lying between them and the Chicken Islands to the northward is about ⅞ mile wide.

Chart 14830.—North Passage.—Southeast Shoal, Ont., with its outer limits about 6 miles southeasterly from Point Pelee and about 10 miles east of Lighthouse Point of **Pelee Island,** has depths of 14 to 18 feet. Southeast Shoal Light, 70 feet above the water, is shown from a white square structure with black stripes on a pyramidal base near the south end of the shoal, 5.9 miles 157° from Point Pelee. A fog signal, radiobeacon, and radar transponder beacon (Racon) are at the light. (See Light List for details.) The light marks the turning point for vessels using Pelee Passage. A special buoy, 1 mile 180° from Southeast Shoal Light, serves as a traffic buoy at this turning point. A lighted buoy, about 0.6 mile southwest of Southeast Shoal Light, marks the south limit of the shoal.

Wreck.—The wreck of the barge **Tasmania,** located 3⅛ miles southwesterly from Southeast Shoal Light, had a least depth of 22 feet over it in 1942. It is not marked.

At **Point Pelee** (more fully treated in section VI) a very shallow sand and gravel spit extends southward about 2½ miles, with a lighted bell buoy at its outer end; this buoy lies on the south side of a submerged crib having 6 feet of water over it. **East Shoal and Southeast Shoal,** with other detached spots extend the dangerous area to a distance of about 6 miles southeasterly from the end of the point. East Shoal, about 3 miles southeasterly from Point Pelee, has a least depth of 11 feet.

Wreck.—The wreck of the steamer **Specular,** lying about 3⅛ miles southeast from Pelee Passage Light, had a least depth of 17 feet over it in 1942.

Pelee Passage is the main channel through the island region. The rock shoal, near the easterly end of the sailing course, was removed in 1966 and the course now affords 29½ feet of water for the large carriers bound to and from the Detroit River. A midchannel buoy is located approximately 4,600 feet 025° from Pelee Passage Light.

Middle Ground Shoal is a rocky reef reaching one mile south of Pelee Passage Light and ¼ mile north of it, with width of about ¾ mile; depths of 8 to 12 feet prevail well over the area. A lighted buoy is located approximately 1,750 feet 028° from Pelee Passage Light.

Pelee Passage Light, 77 feet above the water, is shown from a red and white circular tower near the north end of Middle Ground Shoal, about 5.2 miles 227° from Point Pelee. It marks the western entrance to Pelee Passage.

Grubb Reef, on the northerly side of the passage opposite Middle Ground Shoal, comprises several rocky patches, the shoalest of which has 11 feet of water on it, located northeasterly 2½ miles from Pelee Passage Lighthouse. Shoal water extends 2,000 feet north and 3,000 feet south of the shoalest spot, and a detached 17-foot shoal lies one mile southeast of it. A buoy is moored off the south side of a 17-foot spot, about one mile south of the main reef and 1.3 miles northeast from Pelee Passage Light, close northerly of the deep vessel course.

Submarine Pipeline.—A pipeline commences at the shoreline about one mile southeast of the mouth of Sturgeon Creek, Ont., and extends generally south through Grubb Reef and curves southeasterly in crossing the Pelee Passage Channel and east of Pelee Passage Light and the Middle Ground to a point about 2½ miles southeast of Pelee Passage Light. The pipeline is not marked.

Charts 14830, 14844.—Pelee Island, Ont.—Pelee Island, the largest island in Lake Erie, is about 5¾ miles northeasterly of Middle Bass Island and about 8½ miles southwest of Point Pelee on the Canadian mainland. Its extreme length between the most southerly and northerly points is about 8¾ miles, and the greatest width, which is near the south end, is about 3 miles.

Lighthouse Point is at the north end of the east shore and is the most northerly projection of the island; Pelee Island Light on this point was discontinued in May 1909. From Lighthouse Point a rock shoal extends northeast 1 mile. The area between this point and Middle Ground is fouled by spots of 14 to 18 feet depth.

The rocky bank along the east side of the island is from ½ to 1½ miles wide, the maximum extent being just south of **Middle Point.** Just southward of **Mill Point,** the southeast point of the island, a detached rocky shoal with 10 feet and upward reaches 1½ miles to eastward.

South Bay, a broad indentation in the south shore east of Fish Point, is shoal within ¾ mile of shore.

Fish Point, the southerly extremity of the island, is a narrow point extending about one mile from the main body of the island, with very shoal water for ½ mile farther in its prolongation, and with a bank and detached shoals for about 1¾ miles southeasterly from it and 3¼ miles east of it. The southeast reef, rocky and with least depth of 7 feet, is about ⅝ mile northeast of Middle Island, the latter island being 1¾ miles southwesterly from the extremity of Fish Point. Chickenolee Reef, the name of the outer shoal eastward of Fish Point, has depths of 1 to 6 feet over an area of ½ mile east and west and a buoy is located on the easterly side of this reef.

West Dock is a Government wharf 597 feet long and from 15 to 40 feet wide, with a warehouse, located on the west side of Pelee Island, a little south of its midlength, with 14 feet of water available; there is a light 26 feet above the water on a white circular steel tower with a red top at the outer end of the wharf. A post office is located at this point. From the shore just to the south of West Dock, a bank with depths of 16 to 21 feet extends 3¼ miles westerly toward the Chicken Islands; aside from this the deep water approaches to within ⅜ mile along the westerly shore of the island.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is located at South Bay and at the main ferry dock on Pelee Island.

North Bay is an opening in the north shore southwest of Lighthouse Point, Pelee Island, and inclosed on the west by **Point Sheridan** at the northwest corner of the island. The head of the bay has less than 12 feet of water for about ⅜ mile out. North Wharf, formerly known as Scudder Wharf, located on the southeasterly shore of the bay, is a Government pier 836 feet long with a warehouse 70 feet by 15 feet in size and a grain elevator on it. A light is located on this elevator near the outer end of the main wharf. In 1934 the basin at the wharf was redredged to a depth of 14 feet for a length of 400 feet and width of 250 feet. An approach channel to the North Wharf, 1,850 feet by 100 feet, was dredged in 1976 to 16 feet. A steel sheet pile protection crib for small boats, 177 feet long and 18 feet wide, extends easterly from the dock at a point about 400 feet from the shore and 450 feet inward from the outer end of the dock. Approximately 400 feet northeast of the main wharf, a rubble mound breakwater, 695 feet in length, was built in 1953, which extends out from the shore parallel to the main wharf and converging at the outer end to provide a sheltered mooring area for small boats. In 1961 the harbor basin formed between the north wharf and the rubble stone breakwater was dredged to 8 feet for a length of from 200 to 275 feet and a width of 375 feet. Four timber catwalks, each 40 feet long and 5 feet wide, and spaced 33 feet center to center, extend southerly from the south face of the steel sheet pile protection crib. There is a light at the end of the protection crib. A timber pier 300 feet long by 10 feet wide extending northerly from the southern shore of the harbor was constructed in 1958 for the use of small pleasure craft. A rubble stone breakwater 550 feet long with a light at its northeast extremity, runs in a northeasterly direction from a point 400 feet north-west of the north end of the North Dock. There is a post office near the wharf, and there is a ferry service from North Wharf to Leamington on the mainland. A submarine cable connects with the Canadian mainland at Leamington, providing telephone communication; a submarine power cable has been laid from the mainland ¾ mile northwesterly from the tip of Pelee Point to the island about 1 mile southwesterly of Lighthouse Point; vessels are cautioned not to anchor in the vicinity of the cables. McCormick Wharf, on the east side of Point Sheridan, is in ruins.

Chart 14830.—Wrecks.—The wreck of the steamer **Charles B. Packard,** sunk September 16, 1906, is located 7¾

miles northwest from Pelee Passage Light; sweeping in 1942 showed a least depth over it of 21 feet. Another obstruction, probably an old wreck, lying 1⅞ miles northeasterly from the Packard, had a least depth of 21 feet over it in 1952. These obstructions are from 2 to 3 miles north of the vessel course to Pelee Passage.

Charts 14830, 14844.—**Island Area West of Pelee Island, Ontario.**—Hen and Chicken Islands, Ontario, lie from 5 to 6 miles west of the middle of Pelee Island. **Hen Island,** the largest and most northerly of the three, is 5⅞ miles southwesterly from the northwest point of Pelee Island; it is about 700 feet in diameter and has shallow water for about 1,000 feet off on its east side and about 700 feet on its west side. **Hen Island Shoal,** an 18-foot rocky spot, is 1¼ miles northeasterly from Hen Island, being about ⅝ mile to south of the course between Pelee Passage and West Sister Island Lights, where it might prove a menace to deepdraft vessels in heavy weather.

Little Chicken Island, about 1⅛ miles southeasterly from Hen Island, is a small outcropping of a very shallow rocky bank, extending ⅝ mile north and northwest from the island, ⅜ mile to the east, and about ¼ mile to the south. The deep channel, with from 18 to 30 feet between this bank and Hen Island, is ¼ mile wide, its northerly line passing ¼ mile south of Hen Island.

Big Chicken Island is situated 1½ miles southwest from Hen Island, 1¼ miles westerly from Little Chicken, and 3⅛ miles north of North Bass Island. A broad rocky bank with exposed spots reaches ⅝ mile northeast from it and is nearly ¾ mile across at its northeast end. The greatest available depth between the two Chicken Islands is 18 feet.

East Sister Island, Ontario, lies 8½ miles west of Point Sheridan on Pelee Island and 3¼ miles northwesterly from Hen Island. It is about ⅝ mile long on its northwest face and about ¼ mile across at the southwest end, diminishing to a point at the northeast end. Its shores are shoal to about ¼ mile off. The outer limits of **East Sister Shoal,** with only 4 feet of water, are about one mile northeast of the northeast point of the island, and the inner edge about ½ mile from the same point.

North Harbour Island, Ontario, is ⅞ mile north of the westerly end of East Sister Island, is of small extent, and is located on a bank ½ mile long north and south by ⅜ mile east and west. **North Harbour Island Reef** lies with its southwest end 1¼ miles north of North Harbour Island, and extends thence northeast over ⅝ mile, where it is marked by a buoy. The reef has 2 feet depth in the center. In rough weather vessels should not go between North Harbour Island Reef and North Harbour Island.

Chart 14830.—**Middle Sister Island, Ontario,** the most northwesterly of the Lake Erie island group, is 7½ miles northwesterly from East Sister, and 9 miles northeasterly from West Sister Island, Ohio; it is about ¼ mile long northeast and southwest and generally narrow. The greatest extent of shoal water from it is at the south end, being about ⅜ mile. A light is shown 60 feet above water on a steel tower on the north end of the island.

Section VI.—North (Canadian) Shore from Mouth of Detroit River to Port Burwell

Regional Charts: Chart 14820; Chart 14830

Charts of Canadian waters are prepared by the Canadian Hydrographic Service, Department of the Environment, Ottawa, Canada

Chart 14830.—Bar Point is the rounding formation of land marking the east or Canadian side of the mouth of the Detroit River. In its natural state the river mouth was broad and predominately shallow, necessitating dredging to secure an unobstructed channel from deep water in the lake through the shallows past Bar Point and up the river; details of the improved channels are given under the heading of the Detroit River.

From Bar Point the shore trends southeasterly about 11 miles to **Littles Point,** just east of Colchester. The shoal water offshore for about 6 miles southeasterly from Bar Point is the eastward continuation of the shallow area above mentioned off the mouth of the river. Thence to Colchester the water is deep at ½ mile out. Fishtraps extend 3,000 feet into the lake.

Colchester, Ontario, 12 miles east of the Detroit River, has a wharf 593 feet long, comprising 178 feet of stone approach and 415 feet of cribwork with concrete superstructure rising 6½ feet above water level. At the outer end of this wharf, running in a northeasterly direction, is a breakwater 200 feet long, built of crib work with concrete superstructure, surmounted with rubble stone, rising 9.5 feet above water level. Extending easterly from this 200-foot long breakwater, and joined to it, a rubble stone breakwater extends 295 feet. A further 265-foot rubble stone breakwater was constructed in 1956 and this was subsequently extended easterly to the shore. There is from 5 to 13 feet at the outer 250 feet of the wharf, shoaling gradually thence to the shore. The depth inside of the concrete breakwater is not more than 3 feet generally, but an area 455 feet by 230 feet at the west end of the harbour was dredged to 4 feet in 1973.

Aids to Navigation.—A light on a steel pipe tower is located at the easterly end of the west rubble breakwater.

Water Intake.—A water supply intake pipeline extends lakeward 1,200 feet 182½° from a point on shore 1,750 feet east of the wharf at Colchester.

Wreck.—The sunken schooner **M. I. Wilcox** lies southwesterly about 2,000 feet from the outer end of Colchester Dock, and 4⅛ miles northwest from Colchester Reef Light. When examined by the Lake Survey, May 12, 1906, the wreck was in 22 feet of water, with about 7 feet over her decks. In 1952 the Canadian Hydrographic Service reported that no trace of the sunken schooner could be found.

Grecian Shoal embraces a group of spots with depths of 9 to 17 feet, boulder bottom, about ¾ mile southerly from the shore at Colchester, and marked by a buoy on the southerly edge. The maximum extent of the shoal is about ½ mile east and west and the same distance north and south.

Colchester Reef is a small spot about 3⅝ miles south-

easterly from Littles Point, as the rounding shore line just east of Colchester is called. A lighthouse erected on the reef exhibits a light, 64 feet above the water on a red skeleton steel tower. While deep water exists on the north side of the light, its navigation by large vessels is rendered hazardous by wrecks and shoals.

Wrecks.—The wreck of the steamer **Grand Traverse**, located 1.1 miles northerly from Colchester Reef Light, had a least depth of 23 feet over it as shown by sweeping in 1942. Another wreck, 2⅛ miles northeasterly from the same light, had 23 feet of water over it in 1942.

Pigeon Bay.—From Littles Point, the coast runs on an irregular line about northeasterly 10½ miles to Kingsville, thence easterly about 6¾ miles to Leamington at the westerly base of Point Pelee. The shallow water along this shore is generally about ⅜ mile in width, except a stretch from about 4 miles west to about one mile east of Kingsville, along which the maximum width is about ⅝ mile. Kingsville and Leamington are located on a broad bay open to the south and west and called Pigeon Bay, its easterly shore being formed by the extension southward of Point Pelee.

Cedar Creek, Ontario.—The community of Cedar Beach is primarily a summer resort and is located approximately 2¼ miles west of Kingsville Harbor. At the mouth of Cedar Creek, and on the west side, there is a timber sheet pile cantilever training wall extending 715 feet into Lake Erie in a southeasterly direction. Parallel to the west wall, and on the east side of the creek mouth, there is a timber sheet pile training wall extending 580 feet into the lake from the Township Park. These two walls form an entrance channel 60 feet wide. The outer ends of the walls are marked by lights.

In 1972, there were depths of 3 feet between the walls.

Caution.—Mariners are cautioned that depths are subject to continual change in this area due to shifting sand.

Kingsville, Ontario, situated on Pigeon Bay, about 10½ miles northeast of Colchester Reef Light, is an important shipping point for fish and farm products, and the harbor affords the best shelter between Bar Point and Point Pelee.

The harbor consists of a small basin formed by two converging piers, about 195 feet apart at the entrance and about 800 feet apart at the shore line. The east or landing pier is 820 feet in length and extends 859 feet southerly from the shore, and the west pier or breakwater extends 950 feet southeasterly, to about opposite the east pier, thence southerly about 562 feet, and thence easterly 400 feet. The East Pier is constructed of steel sheet piling with a reinforced concrete deck. The west pier or breakwater is constructed of steel sheet piling with concrete superstructure for the outer 742 feet, thence steel sheet pile wall for 941 feet. A steel sheet pile headwall and seven steel sheet pile landing wharves have been constructed at the shore end of the inner harbor for mooring of fish tugs and small pleasure craft. A coal storage area is located at the inner portion of the pier. The entrance channel, which extends 2,200 feet southeasterly from the outer end of the east pier, was dredged in 1973 to a grade depth of 16 feet and a width of 220 feet. However, shoaling occurs across the channel, and the controlling depth cannot be guaranteed. A berthing area 700 feet long and 100 feet wide, with a depth of 16 feet, was dredged inside the harbor along the west pier in 1961.

Aids to Navigation.—A light is shown on the outer end of the west breakwater. Another light is shown from a mast on the outer end of the east pier and, a fog whistle sounds as required. Range lights are located at the inner end of the harbor, 325 feet apart and bearing 308°10′.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is on the Cedar River at Kingsville.

Water Intake.—A water supply intake pipeline extends lakeward 1,350 feet 185° from a point on shore 3⅝ miles west of the wharf at Leamington.

Leamington, Ontario, is situated on Pigeon Bay about 7 miles east of Kingsville and at the westerly base of Point Pelee. There is telephone, mail, and boat service to Pelee Island and Sandusky, Ohio. The Government wharf is constructed of combined timber and concrete, with length of 1,863 feet and width varying from 23 to 152 feet, a 50-foot by 350-foot addition having been completed in 1963. On the west side, the wharf has been widened by 16 feet for a distance of 900 feet starting at the shore end. There are two warehouses on the wharf, one of steel and concrete 60 feet by 301 feet in size and one of wood with metal sheathing 16 feet by 40 feet in size. The harbour is not maintained. In 1962, a ferry landing 80 feet long by 25 feet wide was built 100 feet inshore of the bend of the wharf, and the area adjacent to the landing was dredged to 10 feet. A new stone rubble breakwater running east and west and located 1,430 feet southerly from the end of the wharf has been constructed.

Aids to Navigation.—Leamington Light is maintained on the southern end of the warehouse. Electric lights along the wharf are lighted only when loading or unloading the vessel. The new stone rubble breakwater is marked on the east end by Leamington Breakwater East End Light and off the west end by a buoy.

Water Intake.—The H. J. Heinz Co's water intake commences at a point on the shoreline 1,200 feet east of the Government wharf, and extends a distance of 1,700 feet into the lake on a southwesterly bearing; the crib at the outer end has 14 feet of water over it and is marked by a buoy.

Sturgeon Creek, Ont.—Two miles east of the government pier at Leamington, offshore protection outside the mouth of Sturgeon Creek was provided in 1968. It consists of two rubble breakwaters, 660 feet long on the west side of the creek, and 480 feet on the east side. The entrance gap is 125 feet wide, the shoreward ends are 440 feet apart.

A channel 60 feet wide and 6-foot grade depth was dredged in 1968 within the protected area and as far upstream as the new high level bridge. Beyond the bridge, a marina development was under construction in 1968.

Aids to Navigation.—The outer ends of the east and west breakwaters are marked by lights 20 and 28 feet above the water, respectively.

Point Pelee, Ont., is a peninsula about 34 miles east of

the mouth of the Detroit River, projecting about 10 miles southerly into Lake Erie, narrowing uniformly and terminating in a sharp point. Excellent anchorage is available to leeward of the peninsula. There are no landing piers or docks on the point. Deep water approaches to within ⅜ mile on both sides of the peninsula, but from the extremity of a very shallow sand and gravel spit extends southward about 2½ miles and is marked off its outer end by a lighted bell buoy.

East Shoal and Southeast Shoal, with other detached spots, extend the shallow area to a distance of about 6 miles southeasterly from the end of the point, as previously described in connection with Pelee Passage in section V, above.

Chart 14820.—From the easterly base of Point Pelee the coast trends northeast to **Pointe aux Pins,** which is a game sanctuary and game preserve, and just west of which is the bay forming the harbor of Rondeau. The shoal bank along this coast extends to 1 mile off near Point Pelee, but elsewhere is close inshore, and the land is from 30 to 80 feet high at the middle of the stretch. The distance between the extremity of Point Pelee and Pointe aux Pins is about 42 miles. A light is shown at the south end of Pointe aux Pins.

Two Creeks, Ont.—About 2 miles northeast of Wheatley, Ont. is Two Creeks.

Wreck.—The wreck of the wooden steamer **Jay Gould** sunk in June 1918, lies 3⅜ miles northeast from Southeast Shoal Light, with least depth of 17 feet over it as shown by sweeping in 1942. The position is well to northward of the vessel courses from Pelee Passage eastward.

Wheatley Harbour, Ontario, is located 11½ miles north of Point Pelee and consists of a narrow inlet at the mouth of Muddy Creek. It is about 1,800 feet long, with an opening to the lake, 70 feet wide. The entrance is protected on the southeast by a steel sheet pile breakwater, which extends about 541 feet into the lake, and on the other side by a steel sheetpile wall, approximately 440 feet long. The entrance channel and the harbor were dredged to 8 feet in 1974.

At the inner end of the harbour, east side, a 440-foot long public wharf was constructed in steel in 1967–68. On the west side of the inner end, a 210-foot wide by 320-foot deep steel walled mooring basin for fishing boats was constructed and dredged in 1965–66. A new concrete bridge and approaches were built at the north end of the harbour by the Township of Mersea in 1966–67. The bridge crosses Muddy Creek on a gravel township approach road relocated approximately 60 feet to the north of the old road.

Aids to Navigation.—Wheatley Harbour Front Range Light is 23 feet above the water and mounted on a white circular tower with a red top on the outer end of the extension to the east pier. The rear range light, 32 feet above the water, is 910 feet 342° from the front light. A fog whistle located at the top of the front range light tower, sounds as required.

Water Intake.—A water supply intake crib for the Ontario Hospital at Cedar Springs is located just offshore in Lake Erie approximately 9¾ miles west of the entrance to Rondeau Harbor. The crib is marked with a buoy.

Caution Area.—Cedar Springs.—A Canadian Land Forces Exercise Area is located at Cedar Springs, Ont., and extends 4,000 yards lakeward from 42°16′00″ N., 82°01′00″ W., through an arc of 020° from 135° to 155°. This area is only in use intermittently and the period of use will be announced by local Ministry of Transport "Marine Radio Broadcasts" and may also be advertised in local newspapers.

Rondeau Harbour (Erieau), Ontario.—An important harbor of refuge on the north shore, 3½ miles west of Pointe aux Pins and about 64 miles east of the mouth of Detroit River; it is a summer resort and a fishing harbour. The bay of Rondeau is 6 miles long by about 2 miles wide, and rather shallow, except in the basin near the entrance.

Improvement Works.—The entrance to the harbor at the southern end of the bay is protected by two piers, with a channel between them 250 feet wide. The structure on the west side is a combined breakwater and pier which serves shipping and acts as a retaining wall. The outer or breakwater section is of concrete, 1,000 feet long and 30 feet wide, and the inner pier is of steel pile and concrete construction, 1,092 feet long and of varying width up to 59 feet. The east pier, built of timber, steel piling, and concrete, is 787 feet long and from 29 to 32 feet wide. A warehouse 40 feet by 80 feet in size is located on the west pier.

Extending westerly at right angles from the inner end of the west pier is a coal unloader and track 1,800 feet long, forming the south side of the Lake Erie Coal Co. slip. The west end of this slip, which projects into the shore, is about 70 feet wide. The outer end opens into the harbor basin.

A boat basin, extending northerly from this point, and consisting of a steel sheet pile wharf running north and south 500 feet long, with seven 150-foot timber mooring jetties extending easterly therefrom. The basin is protected by a rubble mound breakwater 750 feet long, and 300 feet distant from the steel sheet pile wharf, and is dredged to a depth of 9 feet.

Considerable shoaling has taken place at the entrance, and dredging was performed in 1968 to 22-foot grade. The outer entrance is to eastward of the line of the range lights. Currents through the entrance occur at times of temporary fluctuations in the level of the lake, varying in intensity with the difference in level thus produced between the lake and bay.

Soundings taken in 1974 indicated controlling depths as follows: 14 feet below chart datum in the entrance channel; 12 feet in the harbour.

Aids to Navigation.—Two lights form a range for entering the harbor. The front light is on the outer end of the west breakwater. The rear light is on the west breakwater 1,350 feet 012°40′ from the front light. A light is also shown at the outer end of the east pier. A fog signal is at the front range light.

From Point aux Pins the coast runs northerly and

then northeasterly to Port Stanley, about 43 miles distant. East of Point aux Pins there is good holding ground in mud, gravel, and clay, and some protection from westerly winds. The offshore bank between the point and Port Stanley varies in width from ½ to 1 mile. The land in the upper portion of the stretch presents a bold appearance, with a clay bluff from 70 to 125 feet in height. Patrick Point and Point Talbot are slight projections in this bluff section, respectively 14 and 10 miles southwest of Port Stanley.

Morpeth, Ontario, at the turn of shore about 8 miles north of Point aux Pins, had a pier projecting about 243 feet into the lake, but it has washed away. In 1966, there was no facility remaining.

Port Stanley, Ontario.—An important harbor of refuge on the north shore at the mouth of **Kettle Creek,** about halfway between the east and west ends of Lake Erie. A fishing point, summer resort, and receiving port for package freight, grain, oil, scrap metal and bulk coal shipments from United States ports.

Improvement Works.—The inner harbor entrance is formed by two piers extending southward into the lake, about 170 feet apart, with the west pier projecting about 480 feet beyond the end of the east pier into the outer harbor.

The piers lead into an enlarged harbor basin extending to the bascule bridge on Bridge Street at the mouth of Kettle Creek. The east pier is 952 feet long, composed of steel sheet piling for the inner 204 feet, and concrete superstructure on steel sheet piling for the outer 748 feet with a curved outer end. The pier is maintained by the Government, and its entire length is used for discharging of bulk coal.

The west pier is 2,357 feet long, and extends to the bascule bridge at the north end of the harbor. The pier, which is rounded at the south end, is of concrete superstructure on steel sheet piles and cribwork. It has a concrete grain elevator, and a large concrete warehouse, and there is a Department of Public Works of Canada Yard at its northern end. The pier is maintained by the Government, and is used for discharging of bulk coal and loading of scrap iron.

To the west of the outer end of the west pier is the Canadian National (former London & Port Stanley) Railway slip, about 120 feet in average width, inclosed on its west side by a cribwork pier 400 feet long, extending on an irregular line from about the shore line to a point about 100 feet beyond the end of the west pier. This slip is not presently in use and the salvaged **wreck** of the Department of Public Works **Dredge No. 117** lies in it.

The west breakwater, of concrete superstructure on crib substructure, beginning at the shore 250 feet west of the railway pier, extends south 630 feet and thence southeasterly 795 feet to its outer end, which is about on the prolongation of the west pier and 1,300 feet from the outer end of that pier. From the angle in the breakwater, a checkwater arm of the same construction runs 300 feet northeast toward the railway pier, and a rubble-mound checkwater arm, on the west side of the angle in the breakwater, runs approximately due west for 50 feet.

The east breakwater, consisting of combined sections of cribwork, concrete, rubble mound, and timber sheet piling, has its outer end 425 feet northeast from the outer end of the west breakwater, and thence extends in an irregular arc for a distance of 2,922 feet to connect with the east channel pier.

The inner harbor is about 900 feet long and about 350 feet in maximum width at the middle of its length, contracting at either end. Its west side is formed by the northerly end of the west pier, and the east side by a sheet-pile wall extending 1,007 feet from the inner end of the east pier, and thence by shore line 265 feet more or less to the east abutment of the bascule bridge. The controlling depth at this wall is about 8 feet. The southerly 324 feet of this wall, extending northeasterly from the north end of the east pier, was reconstructed in steel sheet piling in 1957 and is now used for the discharging of bulk coal. The remaining 693-foot section was reconstructed in steel sheet piling between 1966 and 1970 and is used for mooring by commercial fishing vessels.

In November 1977, controlling depths were reported to be 14 feet through the inner harbor, thence 11 feet in the northeast portion of the inner harbor; 16 feet was reported available in the buoyed turning basin in the outer harbor. Caution should be exercised in approaching this harbor since the dredged depths are difficult to maintain, especially southeast of the west breakwater headblock.

Aids to Navigation.—Port Stanley Light is on the outer end of the west pier. The front range light is on the outer end of the west breakwater; a fog horn sounds as required, and a marker radiobeacon on 299 kHz is operated during the navigation season. The rear light, on shore about 1,460 feet 341°40′ from the breakwater light, forms a range leading into the harbor and must be left 200 feet on the port side when entering between the breakwaters. Port Stanley East Breakwater Light is displayed 28 feet above the water on a steel tower, at the outer end of the east breakwater. Buoys mark the approach channel to the entrance between the breakwaters. The inner harbor is marked by a light near the outer end of the west pierhead, 1,300 feet north of the front range light.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is located at Port Stanley.

Bridge.—The movable span of the Port Stanley highway bridge will remain closed except at half hour intervals on the hour and half hour for the passage of pleasure craft.

Water Intake.—The Port Stanley water-intake pipe, 12 inches in diameter, extends lakeward 1,600 feet from the shore at a point 2,770 feet westerly from the inner end of the west breakwater. At its outer end is a crib about 8 feet square with 13 feet of water over it, located 2,771 feet southwesterly from the northwest corner of the breakwater.

From Port Stanley the coast continues bold and steep-to, the trend being easterly, with land 140 feet high near Port Stanley, decreasing to 110 feet near Port Bruce, about 10½ miles easterly, and becoming lower toward Port Burwell, 10½ miles farther east.

Port Bruce, Ontario, is a small harbor at the mouth of

Catfish Creek, halfway between Port Stanley and Port Burwell.

Improvement Works.—The entrance is protected by two parallel piers 115 feet apart. The west pier, which projects 345 feet beyond the southerly end of the east pier, is 947.7 feet long, and consists of a 203-foot steel sheet pile jetty, and a 745-foot long steel sheet pile wall. The east pier is 723 feet long, and consists of a partially submerged timber crib, 131 feet long and a steel sheet pile training wall 592 feet long. The depth along the west pier is about 6 feet.

Aids to Navigation.—A light, 22 feet above the water, is located at the outer end of the west pier.

Port Burwell, Ontario.—A harbour at the mouth of Big Otter Creek, about 40 miles west of Long Point Light. It is an important fishing harbour and harbour of refuge for small craft. The harbour is no longer used for bulk coal shipments.

Improvement Works.—The east pier is 1,294 feet long, nearly straight, with an L at its outer end, and extends 900 feet into the lake beyond the shoreline; it is composed of concrete superstructure on timber substructure. The west pierhead, also in the form of an L, is exactly opposite the east pierhead. The west pier is of an irregular line and is 2,280 feet long, composed of a concrete superstructure on steel and timber piles. The width of the entrance between the two piers is 155 feet, narrowing to 125 feet at a point 500 feet further in, whence the space widens to 400 feet in the next 800 feet, and narrows again to 160 feet in the next 900 feet as the river is entered.

A breakwater 1,200 feet long, composed of cribwork substructure and concrete superstructure, extends about southerly from a point 275 feet southwesterly of the outer end of the west pier; at about the middle of its west side there is a rubble-mound checkwater 200 feet long. From the outer end of the concrete breakwater, a rubble-mound breakwater extends 1,800 feet southwesterly, with a concrete lighthouse base at its outer end.

Vessels are cautioned to enter the harbour on range only. A sand bar exists in the outer channel with its ridge running from the headblock of the rubble-mound breakwater in a southeasterly direction. A similar shoal exists to the east of the entrance range. Vessels with a draft in excess of 10 feet enter the harbour at their own risk.

Dredging was carried out in 1973 to provide the following depths: (1) Area A, which extends about 1,500 feet south starting from the south end of the East Pier, 10 feet (2) Area B, which extends about 2,500 feet north starting from the south end of the East Pier, 8 feet (3) Area C, which extends about 550 feet up the river starting from the north edge of Area B, 8 feet.

Aids to Navigation.—A light is shown on the end of the concrete section of the west breakwater: a fog diaphone at this station sounds as required. A light is also shown at the outer end of the rubble-mound extension of the west breakwater.

The range for entrance consists of the front light on the southwest corner of the east pier, and the rear light on the east pier 1,250 feet 355° from the front light.

The outer limits of the dredged channel are marked with buoys approximately 1,000 feet from the West Breakwater Outer Light.

Radio Facility.—A marine radio station at Port Burwell (call sign VBF) is operated continuously during the navigation season.

Harbor Facilities.—In the inner Harbor, a car ferry slip and a steel and concrete coal discharging pier 508 feet long are located on the east side. Car ferry operations are no longer carried on, and portions of the slip have been dismantled. The whole length of the west pier was formerly used for discharging of bulk coal. Inward from the east coal pier there are small timber quay walls to accommodate fishing boats. Just south of the highway bridge, on the east side, the government has constructed a treated timber loading wharf for commercial fishermen. This is a pile bent structure approximately 180 feet long by 12 feet wide protected by a 27-foot long ice fence at its northerly end.

Section VII.—North Shore from Port Burwell to Head of Niagara River, Including the Welland Canal

Regional charts: Chart 14820, Coast Chart 14822

Charts of Canadian waters are prepared by the Canadian Hydrographic Service, Department of the Environment, Ottawa, Canada

The coast from Port Burwell runs southeasterly for about 10 miles and the shore is quite high and of sandy formation; the two Houghton sand hills are conspicuous marks, the easterly one attaining an elevation of 190 feet. The coast next assumes an easterly direction, proceeding toward Long Point, the neck or west end of which is about 20 miles from Port Burwell; the intervening shore may be approached to within ⅝ mile.

Long Point is a narrow peninsula nearly disconnected from the mainland at its west end, from which it extends eastward about 18½ miles. The land at the west end of Long Point is low and sandy, and a cut formerly crossed the neck into Inner Bay, lying north of the point, but this has filled up. The south or lake shore of the point is shoal for about ⅝ mile off, except in the vicinity of the west end, where it is shoal to one mile out. At the eastern end of the point, 2,100 feet from its southeast extremity and about 64 miles southwest of Buffalo, is Long Point Light; a fog horn sounds as required. A radiobeacon is operated at this station.

Wrecks.—(Information of 1916.) The wreck of the steamer **C. W. Elphicke** lies in 24 feet of water on the south side of Long Point, about 6,100 feet 229° from Long Point Lighthouse.

A wreck, with a least depth of 19 feet over it, is located about 2⅛ miles 314½° from Long Point Lighthouse.

Long Point Bay, Ontario.—North of Long Point, and inclosed by it, is Long Point Bay, opening to the east and having depths, outside of shore banks, of 24 to 50 feet, clay bottom. It is 17 miles across at its entrance between Long Point and the north mainland shore, and at its west end terminates in a very shallow recess about 6 miles in diameter, known as Inner Bay.

The South Shore of the bay (north side of Long Point) is of irregular shape and is marked by **Bluff Point**, about 4 miles westerly from Long Point Light, and by **Pottohawk Point**, about 8 miles farther west and about 6 miles northeasterly from the neck or west end. Off Bluff Point, a nearly exposed bank called **Bluff Bar** extends northwesterly about 3 miles, with a buoy marking its outer westerly end and two buoys marking its north side. Westerly from this bar there is a good depth of water along the shore to Pottohawk Point, the 18-foot contour being about one mile or less out. From Bluff Bar to Port Dover, orange spar buoys, about 1 to 3 miles offshore, mark the limits of a fishing area. Commercial fishing is prohibited between these buoys and the shore.

The entrance channel from Long Point Bay into Inner Bay is buoyed for the recommended channel through the shallows between Pottohawk Pt. and Turkey Pt. The buoys in Long Pt. Bay are about 2¾ miles northwest of Pottahawk Pt. and the buoyed channel extends southwesterly.

A lighted buoy, 2.2 miles south of Turkey Point, marks the southerly limit of the shoal which extends south from the point and is used as a turning point by vessels bound for ports in Inner Bay.

Inner Bay, Ontario.—Pottohawk Point, and Turkey Point on the mainland opposite, distant 3½ miles, are the inclosing points of Inner Bay, separating it from Long Point Bay. The maximum depth in Inner Bay is about 10 feet. Generally, the major area of Inner Bay has a depth of 5 feet, shoaling to shore.

Gas Pipelines.—Extensive networks of gas transmission pipelines, including mains and feeders, are located in Long Point Bay and Inner Bay. The Long Point Bay network extends throughout Long Point Bay to Hoover Point, and from the shore line about halfway across the Bay toward Long Point. The Inner Bay network extends easterly across this bay, around Pottohawk Point and along the south shore of Long Point Bay.

Port Rowan, Ontario, a landing on Inner Bay, about 21 miles from Long Point Light and 4 miles from the neck or west end, has a pier 470 feet long at the end of an approximately 480-foot long earth mound causeway, both extending in a southeasterly direction from the shore line. A dredged slip varying in width from 150 to 70 feet and approximately 900 feet long, to the west of the pier and causeway, was last dredged in 1966 to a depth of 3 feet. A slip varying in width from 65 to 95 feet and about 880 feet long was dredged to a depth of 5 feet in 1959 to the east of the pier and causeway. This slip is bound on the easterly side by a steel sheet pile breakwater 819 feet long, parallel to the pier and causeway and 100 and 150 feet distant from these structures. An approach channel 40 feet wide parallel to the line of the pier and extending for 700 feet past its southerly end to 4-foot depth contour in the Inner Bay was dredged in 1966 to provide a depth of 3 feet.

Aids to Navigation.—Port Rowan Light is located on the outer end of the wharf.

St. Williams, Ontario, is a small village located about 3 miles northeasterly from Port Rowan.

A small craft accommodation is located east of the unsafe village landing pier. Facilities available include an enclosed basin, fuel, supplies, repairs and a restaurant.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is located at the J. Booth Marina at St. Williams.

Aids to Navigation.—A flashing light, 34 feet above high water on a circular white steel tower with red top, is located on the outer end of the St. Williams pier.

On the North Shore of Long Point Bay the water is shallow for about 2 miles out at Turkey Point, which is low, the shallows decreasing to one mile width northeasterly toward Port Dover, about 12 miles distant, but again increasing when within about 3 miles of the latter place. A timber pier, 500 feet long and with 6 feet of water at its outer end, built 3 miles north of Turkey Point, is in disrepair. One-half mile north of this pier the shore becomes bold and has an elevation of about 150 feet up to Port Dover.

Port Dover, Ontario.—This harbor is on the north shore of Long Point Bay, at the mouth of the River Lynn, about 67 miles west of Buffalo, N.Y.

Improvement Works.—The entrance channel between the piers is 100 feet wide for a length of 300 feet, widening to 300 feet in the next 350 feet, and ending in a turning basin 300 feet square. The east pier, of timber cribwork with concrete superstructure and 1,000 feet long, forms the easterly side of the channel and turning basin. The River Lynn, extending about 1,200 feet inward from the harbor area, provides sheltered mooring and anchorage for fishing boats.

Soundings completed in 1968–1977, indicated controlling depths as follows: 9 feet in the entrance channel between the piers; 8 feet in the turning basin; 8 feet in the river to the new bascule bridge completed in 1971; 7 feet above the bridge to the Port Dover Yacht Club.

The old Shenango slip west of the west pier, which is not now used, has a least depth of 3 feet. The pier on the west of this slip is destroyed except for a part of the substructure; it extends 250 feet beyond the outer end of the west pier and is submerged about 2 feet.

The east basin for commercial fish tugs is approximately 373 feet wide by 519 feet long, with service areas along its northerly and easterly limits. Within the basin are 3 landing piers 8 feet wide by 132 feet long, extending from the northerly wall of the basin. The 1969 dredged depth was 8 feet below zero datum. Access to the basin is by means of a 100 foot wide gap in the east pier, and vehicular access to the service areas is via Brant Hill on the east side of the Lynn River.

Aids to Navigation.—Two lights form a range for entering the harbor. The front light is on the west pier 110 feet from the end; the rear light is 1,282 feet 021°25′ from the front light, on the west bank of the river. A foghorn at the front light sounds as required, and a marker radiobeacon on 316 kHz is operated the year round. A light is situated on the east pier 20 feet from the outer end, and a light is also placed to illuminate the outer end of the breakwater extending into the harbor from near the inner end of the east pier.

Speed of Vessels.—Canadian Public Harbour Regula-

tions, issued under Pt. 10 of the Canada Shipping Act, for the harbour of Port Dover, Ont., Section 74, specify "No vessel shall navigate at a speed in excess of four miles an hour in that part of Port Dover harbour comprising Black Creek and Lynn River as far as the outer limit of the piers at the entrance thereto".

The southeasterly limit of a shoal area extending southeasterly from Port Dover, is marked with a lighted buoy. The buoy is in about 22 feet of water, 9,000 feet 144° from the front range light at Port Dover.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is located at the government dock at Port Dover.

Between Port Dover and Port Maitland, a distance of about 32 miles, direction easterly, the shore line is much broken by numerous small points, and the off-lying shoal formation is very irregular.

An ore unloading wharf is under construction at the Steel Company of Canada plant, about 6¼ miles east of Port Dover. The wharf extends about ¾ mile from shore and is marked at its outer end by a light.

Nanticoke Creek.—The entrance to Nanticoke Creek, about 7 miles east of Port Dover, had a least depth of 4 feet in 1972. However, these depths are difficult to maintain due to rapid filling of the channel. During 1953, steel sheet pile breakwaters were constructed on the east and west sides of the entrance channel, in lengths of 300 feet and 650 feet, respectively. The outer 250 feet of the west breakwater was replaced by a rubble mound in 1958. The harbor face of the east breakwater was faced with rubble talus in 1965. Nanticoke Light, a directional range light, showing a fixed white light on the approach with a red sector to the east and a green sector to the west, is located on a white mast on the north bank of the harbor entrance; a fog whistle sounds at the light, as required. A light is also located on the outer end of the riprap breakwater.

Nanticoke Shoal, with 6 feet of water, the only detached obstruction in Long Point Bay, is about 3½ miles off the north shore at Nanticoke, and bears southeasterly 7¼ miles from Port Dover front light and north 12¾ miles from Long Point Light. It is marked with a light and bell buoy on the southeast side of the shoal.

Long Point Bay Fairway buoy is located in 42 feet of water about 3¼ miles southwest of Nanticoke Shoal on line with the Nanticoke Generating Stat. channel extended.

Nanticoke Generating Stat.—This station is located about one mile east of Nanticoke Creek, Ont. The privately buoyed approach channel, reported swept to 29½ feet in 1972, is from the southwest into the northeast, passing to the northwest of Nanticoke Shoal. The dredged channel extends about 25,000 feet 043° from deep water to the inner junction with the dredged dock approach channel. The dock approach channel extends about one mile 344° to the South Range Light and had a depth of 27 feet in 1972. The South Range Light is located about 6,430 feet 087°30′ from Nanticoke Creek Sector Light. Two prominent stacks 900 feet apart and 668 feet high, are located about 1,588 feet 257° from the South Range Light. Two Range Lights and Daylight Targets, #1 and #2, are located about 8,550 feet 076° from the South Range Light to represent the centre line of the dredged approach channel, bearing 043°15′ true.

Caution.—Several sections of gas well pipeline cross the channel on the lake bottom in this general area. Mariners are not to drag anchor in the channel northwest of Nanticoke Shoal between the 25,000 and 15,000-foot marks taken from the inner junction of the two channels.

At **Peacock Point,** 11 miles from Port Dover, a reef with 7 feet at its outer end reaches to the southwest about 3½ miles, approaching to within 2 miles of Nanticoke Shoal, above described. From Peacock Point the coast is not safe to approach within 1½ miles, easterly past **Hoover, Featherstone** (formerly **Miller**), and **Evans Points** except for small craft. At Sandusk Creek, 1¾ miles northeast of Peacock Point, a light is shown from a white circular steel tower with a red top. About 2¾ miles southerly off Evans Point is the outer end of **Tecumseh Reef,** which, though detached, practically forms the outer continuation of a long, narrow bank, with 4 to 8 feet of water prevailing, extending in all 4¾ miles southwesterly from the shore at **Blott** and **Low Points** about 5 miles west of Port Maitland. The southwest extremity of the reef bears 8¾ miles southwest from Port Maitland Light and is marked on the most southerly edge with a lighted buoy. Foul ground is found for 1½ miles southwesterly off Grant Point, just westward of Port Maitland.

Port Maitland, Ontario.—This is a harbor at the mouth of **Grand River,** 35 miles west of Buffalo, N.Y. The river empties into the head of the bight formed between **Grant Point** on the west and **Rock Point** on the east.

Improvement Works.—The entrance to the port is protected by two breakwater piers, which are 292 feet apart at the outer end. The controlling depth in the fall of 1958 was 24 feet in the approaches to the harbor outside the piers.

Dredging operations in the Grand River in 1961 provided a depth of 22 feet in a 270-foot wide channel from the rear light to a point about 600 feet upstream from the entrance to the coal slip of the Toronto, Hamilton and Buffalo Railway. A rock outcrop is located along the West Pier 150 feet south of the Rear Range Light. The outcrop projects into the dredged channel 30 feet, approximately 50 feet from the pier face. Reduced water depth over rock is 15½ feet to 18 feet.

Aids to Navigation.—Port Maitland Range Front Light, is located on the west pierhead; a fog horn sounds as required. The rear light is located on the west pier at the angle 900 feet 020°45′ from the preceding light. A light, mounted on a white circular steel tower with red top, 25 feet above high water, is on the outer end of the east pier.

Harbor Facilities.—About 3,000 feet above the front range light is a slip on the east side of the river. It comprises the lower 1,000 feet of the Old Welland Canal feeder and is now utilized by fishing tugs.

On the same side 1,000 feet further upstream is the slip of a fertilizer manufacturing firm. It is 150 feet wide with a 1,000 foot berth on the southeast side and a 767 foot berth on the northwest side. In 1959 the slip had a depth of 22 feet.

On the west bank opposite the upper slip are the docks and club house of the Port Maitland Sailing Club.

Grand River, Ontario.—Inward from the north end of Port Maitland Harbor, the Grand River has a generally uniform width of 350 feet for 4 miles up to Dunnville, and 19 feet, 18 feet, and 15 feet of water can be carried to within 3 miles, 2 miles, and 1 mile of Dunnville respectively, and 10 feet to Dunnville itself. The current in the river varies greatly depending largely on the wind.

Obstruction.—About 3¾ miles upstream of the pier head at Port Maitland, there was a shoal in 1965, with a depth of 2 feet of water over it in midstream of the Grand River. A buoy marks the obstruction.

Dunnville, Ontario.—A low dam at Dunnville is the head of navigation on the Grand River. There is a Government wharf about ¼ mile downstream on the northeast bank of the river.

Between Port Maitland and Port Colborne, about 17 miles eastward, the coast continues broken by points with irregular shoals extending out from them. **Mohawk Island** is a small island about 2¾ miles east of Port Maitland and about one mile off Rockhouse Point. The water in **Mohawk Bay**, inside the island and inclosed by Rockhouse and **Mohawk Points**, is shallow and rocky shoals extend also about a mile southeast from the island with a lighted buoy located about 1⅛ miles southeast of Mohawk Island, just off the island shoals. However, 10 feet can be carried through Mohawk Bay by holding midway between Mohawk Island and the shore. **Moulton Bay** forms just east of Mohawk Point. Its west shore is shoal for about ½ mile off, and a very shallow reef extends one mile southerly from the first small point on the north bay shore, as also from **Kinnard Point** next eastward. **Morgans Point**, the next and more prominent projection, is about 5 miles west of Port Colborne. From its south extremity and east face shoals make out about ½ mile.

Sugar Loaf Point is the low, rocky, west point of **Gravelly Bay**, in which is constructed the outer harbor of Port Colborne, designed as an extensive transfer station for the Welland Canal traffic, as more fully mentioned in the harbor description. Close northwest of Sugar Loaf Point is a large sandhill called the Sugar Loaf, 141 feet high. The water in this vicinity is shallow to ⅝ mile out.

Chart 14822.—Port Colborne, Ontario.—This harbor is the Lake Erie entrance to the **Welland Canal**, about 18 miles west of Buffalo, N.Y. There is about 3¾ miles of dock wall available for winter mooring, of which 3¼ miles has not less than 30 feet depth and the remaining ½ mile affords 14 feet depth; 1¾ miles of the wall is below Lock 8 where the water surface is controlled at a fixed elevation.

The master of any radiotelephone-equipped vessel about to enter Port Colborne harbor from Lake Erie shall telephone radio station Seaway Welland on Channel 14, frequency 156.7 MHz when the vessel approaches the Three Mile Light and Bell Buoy and report to the Traffic Controller. Frequency 156.8 MHz shall be used only for call in and distress purposes. During canal transit between CIP (Calling-In-Point) 15 and CIP 16, a vessel equipped with radiotelephone shall guard channel 14. 156.7 MHz and all conversation will be on 156.7 MHz.

Prohibited Anchorage Area.—His Excellency the Governor General in Council, on the recommendation of the Minister of Transport, pursuant to subsection (4) of section 645 of the Canada Shipping Act, is pleased hereby [Canada Gazette, Part II, Volume 99 (page 484) dated April 14, 1965, No. 7] to make the annexed Welland Canal Entrances Anchorage Regulations.

Welland Canal Entrances Anchorage Regulations

1. These regulations may be cited as the Welland Canal Entrances Anchorage Regulations.

2. In these regulations,

(a) "Minister" means the Minister of Transport; and

(b) "prohibited waters" means the waters of Lake Ontario and Lake Erie, in the Province of Ontario, described as follows:

(i) (See Lake Ontario—Port Weller)

(ii) Lake Erie: beginning at a point south of the Port Colborne Entrance to the Welland Canal located at Latitude 42°51′55″ N., Longitude 79°15′53″ W., as shown on Canadian Hydrographic Chart 2101, THENCE in a 110° direction one statute mile approximately to a position located at Latitude 42°51′37″ N., Longitude 79°14′44″ W., THENCE in a 191° direction three statute miles approximately to a position located at Latitude 42°49′03″ N., Longitude 79°15′24″ W., THENCE in a 290° direction two statute miles approximately to a position located at Latitude 42°49′38″ N., Longitude 79°17′36″ W., THENCE in a 029° direction three statute miles approximately to the point of beginning.

3. No person shall anchor a vessel within the prohibited waters unless authorized by the Minister.

4. (1) Every person who contravenes or fails to comply with these Regulations is guilty of an offense and is liable on summary conviction to a fine not exceeding five hundred dollars.

(2) The owner, charterer, hirer, master, operator or person in charge of a vessel that is anchored contrary to these Regulations shall be deemed to have contravened these Regulations unless, in any prosecution therefor, he establishes that the contravention took place without his knowledge or consent or that he exercised all due diligence to prevent it.

Anchorage Area.—In order that vessels entering or leaving Port Colborne may not be obstructed by vessels which are anchored awaiting permission to transit the Canal, or for other causes, an Anchorage Area southeast of Port Colborne has been defined within a line joining the following positions: (a) Lat. 42°49′12″ N., Long. 79°11′04″ W.; (b) Lat. 42°46′25″ N., Long. 79°14′34″ W.; (c)

Lat. 42°46′25″ N., Long. 79°18′34″ W.; (d) Lat. 42°49′12″ N., Long. 79°15′12″ W. Vessels which have to anchor for any reason off Port Colborne are requested to do so in the above defined area and in no case to anchor westwards of a line joining (a) and (b).

Just east of the Port Colborne entrance, a buoy is located off Cassaday Point due north of the Anchorage Area.

Speed Limit.—The maximum speed limit in Port Colborne Harbour is 7 miles per hour (6.1 Knots) over the bottom.

Improvement Works.—The western breakwater is about 4,300 feet long, located about 4,000 feet offshore and running in a westerly direction from the entrance towards Sugar Loaf Point; it is built of timber cribwork covered with concrete, riprapped with large stones along the south or lake face, and at its eastern end is a concrete covered timber cribwork pierhead 100 feet by 60 feet, on which is the Inner Light of the harbor. A rock shoal area having least depths of 2 to 5 feet, extends from about 600 feet west of the Inner Light, along the north side of the western breakwater for about 400 feet and 150 feet wide. From the above main breakwater at a point about 1,000 feet west of its east end, a spur breakwater extends lakeward a little east of south about 2,100 feet; it is built of concrete cribs and mass concrete superstructure, with rock riprap on its southwesterly face, and terminating in a concrete-crib pierhead 100 feet square, on which is the Outer Light of the harbor. The spur breakwater protects the harbor from southwest gales.

The eastern breakwater begins with a lighted pierhead located 625 feet southeast of the main western breakwater pierhead and extends thence a little north of east 2,460 feet; it is built of timber cribwork substructure and concrete superstructure, with rock riprap along its outer face and western end, and should be given a berth of 150 feet.

West of the channel and 1,650 feet north of the Inner Light are located the Maple Leaf Mill and Government Elevator. The Maple Leaf Mill is on the eastern pier and is separated from the Elevator, which is on the western pier, by a slip 600 feet long, 200 feet wide, and 15 feet deep. The approach channel to the Government Elevator is 19 feet deep, as is the slip on the west side of the Elevator. A line of timber cribwork, 200 feet west of and parallel to the westerly pier, protects the slip. Depths of 10–18 feet are found generally in the Gravelly Bay area west of the Government Elevator except for a series of rock mounds scattered over a width of about 600 feet and having only 2 to 3 feet of water over them with 12 to 16 feet surrounding. This rock mound area extends about 2,000 feet from the southwest section of the timber cribwork, in a southwesterly direction as far as the west breakwater. Small boat facilities are located on the shore north and west of the government elevator. Entrance through the government slip is recommended to avoid the rock shoals.

On the east side of the Maple Leaf Mill dock on the eastern pier the depth is 15½ feet of water alongside increasing to 20½ feet of water 10 feet away from the face of the wharf for a width of about 150 feet between the dock wall and the deep canal channel described below.

In 1964 a new automatic recording water gauge station was installed at the inner end of the west face of the Government elevator.

The harbor entrance channel passes east of the lights on the pierheads of the spur and main west breakwaters, and is 500 feet wide and 30 feet deep. From the pierhead of the main western breakwater, the west limit of the canal channel through the outer harbor follows a straight line to an angle in the west dock wall 300 feet north of the Maple Leaf Mill, this channel being 30 feet deep with width gradually reducing from 500 to 400 feet.

The entrance to the inner harbor and canal is abreast of the Maple Leaf Mill dock, via the channel above described. Opposite the middle of the mill dock an octagonal timber crib marks the easterly edge of the canal channel indicated by a lighted buoy. At points 500 feet and 900 feet north of the above crib are two rectangular timber cribs which should be given a berth of 100 feet in passing. The east dock wall of the inner harbor and canal channel begins at a point 1,600 feet north of the Maple Leaf Mill and 6,000 feet north of the outer light, and extends continuously thence to the guard lock, a distance of nearly 6,000 feet. Just south of the outer end of the east dock wall, the canal channel deflects a little to the west and continues parallel to the east wall, with width reducing to 275 feet in the inner harbor and to 220 feet approaching the first bridge, which is 1.7 miles north of the outer light. The second bridge crosses 300 feet north of the first bridge, and 700 feet north of this the canal curves a little to the east and continues to the guard lock, varying in width from 220 feet to 200 feet. The canal channel through the inner harbor has a controlling depth of 30 feet.

The west dock wall of the inner harbor is continuous from the south end of the Maple Leaf Mill dock to the old canal guard locks, a distance of about 5,000 feet. For 1,700 feet north of the north end of the mill dock this dock wall is along the canal channel, 21½ to 28 feet deep. Vessels drawing more than 21 feet must approach with caution. A rock ledge, protected by wooden fenders, projects beyond the face of this wall a distance of approximately 4 feet, and the depth here is 21.5 feet. On rock fill to the west of the wall are the tracks of the Canadian National Railways to the Government elevator and mill docks, also coaling and oil stations. From the above section to the old guard locks, the depth is between 9½ feet and 13½ feet in the strip between the west dock wall and the deep canal channel. Just north of the second bridge and the old guard locks, there is an opening of 1,000 feet in the bank between the old and new canals, with depth of 14 feet. This gap forms an entrance to the old canal, now the supply channel for the ship canal. North of the gap is the upper west entrance wall, 2,000 feet long, of the new guard lock.

The southerly 1,120 feet of the east dock wall of the canal channel is the Canada Furnace Co.'s dock, and along

the next 1,480 feet of this wall are the yards of the Canadian National Railways and the Rochester and Pittsburg Coal Co.

Aids to Navigation.—The main channel through the outer harbor is marked as "proceeding from seaward" by vessels entering Lake Erie from the Canal, and includes a buoy on the western side at the junction with the channel leading to the Government elevator. Three Mile buoy, a special purpose buoy, is moored in Lake Erie at a point 3.4 miles 206¼° from the Inner Light on the west breakwater. Outer light on the south end of the west breakwater spur, shows a strong beam over an arc of 030° covering the approach from the turning buoy, with a secondary light visible from the harbor side; a fog horn sounds as required. A buoy is located on the east side of the entrance adjacent to the Outer Light. Northward of this point the eastern side of the channel is marked by buoys. Inner Light is on the pierhead at the east end of the main west breakwater; an electric fog bell rings continuously in thick weather and an automatic radiobeacon is operated. West Breakwater Light is mounted 18 feet above the water on a white circular tower at the westerly end of the breakwater extending into Gravelly Bay. East Breakwater Light is on the westerly end of the east breakwater.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is located at the Colonial Yacht Harbour at Port Colborne.

Welland Canal, Ontario.—The Welland Canal is described under the Lake Ontario heading (see Index).

Charts 14822, 14832.—From Cassaday Point, east of Gravelly Bay, a rock shoal extends southerly one mile, marked off the southerly end with a lighted buoy and between this point and **Point Abino,** 8 miles southeasterly of Port Colborne, the shoal border varies in width from ½ to ⅞ mile. Point Abino is the extremity of a peninsula projecting south from the main shore line about 2 miles, and attaining an elevation of 100 feet near the outer end. Deep water is found about ½ mile south of the end of the point.

Point Abino Light is located on the flat limestone beach, 225 feet south from the wooded shore on the south extremity of the point: a fog horn sounds as required. The light tower is floodlighted.

Submerged Pipeline.—A submarine pipeline of Glacier Explorers Limited, has been constructed from a point on shore approximately 10,000 feet northwest of Point Abino Light and extending 4,500 feet 176½° into the lake.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is located at Point Abino.

Abino Bay lies east of the peninsula and is a shallow sandy expanse within a line connecting Point Abino and Crystal Beach. The anchorage is good in sand bottom, but exposed to southeast storms. In the northwest corner of the bay, the Buffalo Canoe Club has a dock installed each spring and extending southeasterly about ¼ mile to afford 5 feet depth (actual) May through September. In September 1975, five feet of water was available at the outer end of the dock, and a range of two green lights marks the channel into the dock. On the west side of Abino Bay is the summer station of the Buffalo Yacht Club. It consists of a basin protected on the south side by an embankment about 800 feet long. The entrance from the bay is marked by a spherical midchannel buoy. The channel is marked by buoys on each side and by a range. The front range mark is on shore at the inner end of the basin and the rear range is located 400 feet 244½° from the front mark. Each mark consists of a yellow diamond shape mounted on a pole and each carries two red lights arranged vertically. The channel into the basin has been dredged to 3½ feet.

Crystal Beach, Ontario, is a summer resort on the Canadian shore 10 miles west of Buffalo. There is a wharf which is not maintained and is barricaded at the shore end.

Water Intake.—An intake pipeline commences from a point on shore 500 feet 199° from the tank at Crystal Beach and extends 1,100 feet 180° to an unmarked crib with 8 feet of water over.

From Point Abino to the Head of Niagara River the coast is characterized by successive recessions and points, and the off-lying water is rendered foul by rock shallows for a distance of ¾ to 1½ miles out, the maximum extent being southeast of **Windmill Point,** 5 miles northeast of Point Abino and about the same distance from the Niagara River. Waverly Shoal, a detached patch about 1½ miles off the Canadian shore near the head of the river, is described under Buffalo Harbor.

Section VIII.—Upper Niagara River

Regional charts: Chart 14820; Coast Chart 14822; Chart 14832

Niagara River above Niagara Falls.—Depths and vertical clearances under aerial crossings and bridges for the Niagara River above Niagara Falls, are referred to the sloping surface of the river corresponding to a Lake Erie stage of 568.6 feet above mean water level at Pointe-au-Pere (Father Point), Quebec, on International Great Lakes Datum (1955), which elevation is the plane of Low Water Datum for that lake.

The International Boundary between the U.S. and Canada follows a general middle of the river course in the upper Niagara River from the head of the river downstream to the head of Grand Island where the river forks around the island. The Tonawanda Channel of the Niagara River passes to the east of Grand Island. Around the north side of Grand Island, the channel through the river is known as the Niagara River Channel. The Chippawa Channel of the Niagara River passes to the south and around the west side of Grand Island with the International Boundary following this channel, generally less than 1,000 feet offshore of Grand Island, until the channels again flow together at the northwest end of Grand Island. The boundary again follows a general middle of the river course around the south side of Goat Island and over the Niagara Falls.

Physical Description.—Lake Erie, converging at its eastern end into comparatively narrow outlines, has its outlet in the Niagara River. For a distance of 4¾ miles from

its head the river flows through a single channel from 1,600 to 5,000 feet wide; then it is divided into two channels by Strawberry and Grand Islands. Chippawa Channel, the western or Canadian channel, is about 12 miles long and from 2,000 to 4,000 feet wide. The eastern or United States channels are about 15 miles long and from 1,500 to 2,500 feet wide above Tonawanda and from 2,500 to 4,000 feet wide below Tonawanda. At the foot of Grand Island these two channels again merge into one channel about 3 miles long and from 4,000 to 7,500 feet wide, extending to the great rapids and falls which are about 20 miles from the head of the river by the shortest channel.

Current Velocities.—The current of the river at its head begins at about the location of **Horseshoe Reef.** For about 1¾ miles the river is wide, shallow, and rocky, and the current is from 2 to 3 miles per hour; thence for about 2 miles follows the engorged section, beginning about 400 feet above the Peace bridge and extending past the International bridge to the foot of Squaw Island. This engorged section is 1,600 to 2,000 feet wide, the narrowest part being the upper ¾ mile in the vicinity of the old waterworks crib just below the Peace bridge, at which point the velocity of the current was measured in 1966 to be about 8 miles per hour at low to mean stages of the river and about 9 miles per hour at high stages. From a point about ⅝ mile below the Peace bridge to the foot of Squaw Island the channel is deep, somewhat wider, and the current less rapid than at the narrowest part of the gorge section. Numerous observations of the current velocity, made at and just below the International Bridge in connection with river discharge work, determine the velocity near midstream to be 4 miles per hour at low to mean stages and 4¾ to 5 miles per hour at high stages.

The two channels around Strawberry and Grand Islands have currents varying from 1 to 4 miles per hour.

Fluctuations of Water Surface.—The fall of the river, taken at the respective mean levels of Lakes Erie and Ontario for the years 1900 to 1972, is 325.56 feet. Details of the approximate fall are shown by the following table, derived from observations of the National Ocean Survey:

From Lake Erie—	*Feet*
To waterworks intake (below Peace bridge)	3.0
To foot of Squaw Island	5.1
To Strawberry Island Upper Rg. Lt	5.6
To Grand Island Rg. Lts	6.3
To head of Tonawanda Island	6.6
To head of Cayuga Island	8.3
To upper rapids (control structure)	10.5

Variations in Lake Erie levels above or below low water datum are reflected in Niagara River levels. The amount of the variation ranges from the full Lake Erie variation, at the head of the river and gradually diminishes downstream to Chippawa-Grass Island Pool, just above Niagara Falls.

Just below the Welland River entrance, about 1.2 miles east of Goat Island, the Niagara waters begin their rapid descent to the level of Lake Ontario through the rapids above the falls, the great falls themselves, and the rapids below the falls, with the following approximate descents:

	Feet
The upper rapids	55
The Niagara Falls	185
The lower rapids	76
Niagara River below Lewiston	0.5

Local Descriptions, From Head of River to Falls

Charts 14820, 14832, 14833.—Niagara River from Buffalo to Tonawanda, N.Y.

Channels.—A dredged channel extends from Buffalo Harbor North Entrance Channel for about 13½ miles through Black Rock Canal and Lock and Tonawanda Channel on the east side of Grand Island to a turning basin at North Tonawanda. From about 0.7 mile below Motor Island downstream to the upper end of Tonawanda Island, the channel is through the natural deep water of Tonawanda Channel.

From the downstream end of the turning basin at North Tonawanda, Niagara River Channel leads along the north side of Grand Island to a basin off the public dock at Niagara Falls, N.Y.

Detailed descriptions of the channels are given under the several heads below.

Caution.—Passing down the Niagara River from Lake Erie toward Niagara Falls is considered "proceeding from seaward." Buoyage in the river and the Black Rock Canal is based on this convention. Red buoys are on the right hand side, looking downstream, and black on the left hand side.

Niagara River—Old Channel.—The channel formerly dredged in the open river from Lake Erie along the west side of Squaw Island has shoaled with depths of 10 to 14 feet or less. The bottom in this reach is generally rocky, and the currents are strong and variable. Great care should be exercised in navigating this section of the river. The Black Rock Canal is the recommended deep route from Lake Erie to the river below Squaw Island.

Ice Boom.—A floating timber ice boom across the mouth of the Niagara River will extend from a point adjacent to the Old Breakwater North Side Light to a point adjacent to the old Erie Beach dock on the Canadian shore Installation in any year will not begin earlier than November 1 with installation to be completed not earlier than the first Monday in December. Complete opening with total disassembly of the boom will be accomplished by May 15 in any year.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. Buffalo waterworks intake crib, a circular building with conical roof, projecting 27 feet above the water, is located in about 14 feet of water at the head of the river, about 3,700 feet 281¼° from Old Breakwater North End Light; it is marked by a light.

Aids to Navigation.—The entrance to Niagara River from Lake Erie is marked on the right hand side by Middle Reef Lighted Buoy, located about 5,800 feet 302° from Buffalo Harbor Light. Buffalo Intake Crib Light is 2,300 feet 085° from the buoy. Between them and slightly

downstream is an abandoned lighthouse on a rock outcrop, consisting of an unlighted black steel skeleton structure with cylindrical top. Between Middle Reef Buoy and the Peace Bridge, buoys mark the right hand side of the channel.

Wreck.—The wreck of a submerged tug was located in about 12 feet of water about 800 feet 299½° from the westerly end of Bird Island. The wreck was not marked. In 1972, this wreck shifted and in 1973 the location of the wreck could not be determined.

Peace Bridge.—About two miles downstream from Middle Reef Buoy is the Peace Bridge, a high level highway bridge connecting Buffalo, N.Y., with Fort Erie, Ont. The river spans are from 365 to 423 feet wide in the clear, with heights at the center of the arches (decreasing from the United States to the Canadian side) of from 91.5 to 56.5 feet. The span over the usual vessel course is the fourth from the U.S. mainland (the first being the bowstring truss over the Black Rock Canal). It has a clear width of 385 feet and a vertical clearance of 67.5 feet at the center of the span. This arch is lighted by two green lights, one upstream and one downstream in the center of the span. Niagara River Intake Crib, marked with a light, is located 300 feet downstream from the center of the third span, making passage through this arch difficult in the turbulent current.

Aerial Cables.—Aerial transmission cables with a vertical clearance of 126 feet cross the river about 900 feet downstream of the Peace Bridge.

International Bridge.—About 1½ miles below the Peace Bridge is the International Bridge, a single track railroad bridge. The fixed spans are from 180 to 222 feet wide and have a clear height of 22 feet. The draw, situated in the main channel near **Squaw Island,** is a swing span with clear opening of 154 feet on the east and 156 feet on the west side. The draw does not open for the passage of vessels.

Bridge Regulations.—See **33 U.S.C. 499,** Published in Certain Laws, preceding, and **33 C.F.R. § 117.708** of Rules and Regulations, preceding.

Fort Erie, Ontario.—A public dock is located just below the International Bridge. The Canada Customs dock for small craft is immediately downstream of the public dock and slightly shoreward. An eddy has been reported in the approach to this dock which tends to force a small craft upstream; caution is advised.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is located at the foot of Jarvis Street in Fort Erie.

The Black Rock Canal enters the river channel at the foot of Squaw Island, about 3,000 feet downstream from the International Bridge. At this point, the Canadian and American channels of the river begin to diverge around the shoals above Strawberry Island, with deeper water close to the mainland shores on each side. The current passing the guide pier below the Black Rock Lock creates a powerful eddy, the water flowing upstream along the U.S. side for more than ½ mile below the lock; allowance should be made for this counterflow in docking or in entering the marina basins.

The description of the Niagara River channel continues immediately following the section on the Black Rock Canal and Lock.

Niagara River Entrance.—The **Black Rock Canal** provides a safe passage for large vessels around the rapids and shoals in the head of the Niagara River.

The Lake Erie entrance to Black Rock Canal is through Buffalo Harbor North Entrance Channel and across the outer harbor Northern Channel to Black Rock Canal Entrance Channel. From its entrance, the canal leads northward along the Buffalo front, parallel with the river and separated from it by Bird Island Pier and Squaw Island. Bird Island Pier and Squaw Island retain the canal pool from the west, and along with Black Rock Canal Lock, serve to keep the canal level at the same elevation as the water surface of Lake Erie.

From Buffalo North Entrance Channel through Black Rock Canal and Lock to the upper end of Strawberry Island, the Federal project depth is 21 feet. (See Local Notice to Mariners and latest edition of charts for controlling depths.) In 1971–1974, 21 feet was available in Black Rock Canal from the upper end of Strawberry Island to the end of the dredged section below Motor Island, thence through the natural deep water section of Tonawanda Channel, and thence in the dredged section along the west side of Tonawanda Island to the turning basin except for lesser depths in the lower 100 feet of the basin.

Bird Island is near the east shore about ¾ mile above the Peace Bridge. A U.S. pier connects Squaw Island and Bird Island, and extends about ¾ mile above the latter. Portions of the Bird Island Pier are constructed of rubble-mound or have stone riprap slopes.

There are no docks or facilities for mooring large vessels along the canal. The Buffalo Yacht Club maintains a small boat basin on the canal adjacent to the Buffalo waterworks pumping station. Downstream from the Yacht Club basin, a berthing area about 400 feet long and 12 feet deep has been dredged for the U.S. Naval and Marine Corps Reserve Training Center. Since completion of the ship canal in August 1914, the waterway is used by lake vessels, canal boats, barges, tugs, and motorboats to avoid the swift currents in Niagara River. There is generally a slight current down the harbor from the lake, but during rapidly rising or high water in Lake Erie there is a strong cross current at the southerly end of Bird Island Pier.

Soundings completed in May 1976 indicated midchannel controlling depths as follows: 19 feet in the entrance channel and thence 20 feet to the lock.

Aids to Navigation.—The turn in the Lake Erie entrance channel, across from the northerly end of the city of Buffalo Breakwater, is marked on the left side by a lighted buoy; on the right side there is a flashing light on the northwest end of the breakwater. The right side of the ship canal from this point to the lock is marked by Light No. 4 and by numerous lighted and unlighted

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buoys. On the left side of the canal are numerous lighted buoys showing a green flash on buoys south of the Peace Bridge and a white flash on buoys north of that bridge, and also a flashing light on Bird Island Pier at the angle about 1,500 feet below Bird Island.

Black Rock Lock, connecting the canal with the river near the foot of Squaw Island, is 650 feet long between quoin posts (usable length 625 feet), 70 feet wide (68 feet in the clear), with 21.6 feet depth over miter sills, and an average lift of 5.2 feet.

Radiotelephone watch on channel 12 VHF-FM, 156.60 MHz, is maintained at station WUD-21, Black Rock Lock. Radio-equipped vessels desiring passage through the lock are requested to contact the lockmaster well in advance of their arrival at the lock in order to eliminate unnecessary delays and facilitate the movement of vessels through the lock.

Effective in 1969, all vessels transiting the Black Rock Canal shall adhere to the following when entering or departing the Black Rock Lock. These controls, including the whistle signal of two long and two short blasts (— — . .), are in addition to the Regulations and information otherwise noted in this Coast Pilot.

1. Maintain only that speed which is necessary to provide sufficient control of the vessel and reasonable headway.

2. Refrain from using bow thruster either in the lock chamber or in the canal from the signal light on the upper east wall to the lower end of the east wall.

Vessels are requested to follow these procedures in order that damage to the operating gates may be prevented.

Lockage for pleasure craft is scheduled downbound on the hour, upbound on the half hours, commercial traffic permitting.

The following signals control the movement of vessels through Black Rock Lock:

For downbound (northbound) traffic, a signal light mounted on a standard on the east approach wall at the entrance to the lock chamber shows green to indicate a clear entrance into the lock chamber. When this signal is red, the downbound vessel will moor at the east approach wall until such time as clear entrance to the lock is indicated by the green light.

For upbound (southbound) traffic approaching the lock from the Niagara River channel, a signal light shows green to indicate a clear entrance to the lock chamber and red to indicate that the lock chamber is closed.

Submerged Crossings.—A submerged pipeline crosses Black Rock Canal about 400 feet downstream of the Peace Bridge. A cable and pipeline cross about 700 feet upstream of the Ferry Street Bridge; two other cables cross immediately upstream of this bridge and another crosses immediately below it. A third pipeline crosses about 700 feet downstream of the bridge. Two more cables cross about 2,100 feet and 200 feet above the International bridge.

Aerial Cables.—Aerial transmission cables with a vertical clearance of 144 feet cross the channel about 1,000 feet downstream of the Peace Bridge.

Anchorage Regulations.—See 33 C.F.R. § 110.1 and § 110.84 of Rules and Regulations, preceding.

Drawbridge Regulations.—See 33 C.F.R. § 117.707a of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.175 and § 207.590 of Rules and Regulations, preceding.

Lower Black Rock Harbor, Buffalo, N.Y. is the name applied to the Niagara River frontage on the main shore of Buffalo below the Black Rock Ship Lock. It is ¾ mile long. The upper half lies between the ship lock and the mainland, forming a slack-water bay about 100 feet wide, with 13 feet of water in the channel; this portion is used as a harbor for small pleasure boats and the Corps of Engineers, Buffalo District basin. The lower half of the harbor fronts on the open river and extends from the foot of Hamilton Street to Ontario Street, with two small boat basins, a commercial wharf and a municipal boat launching ramp, along which the depth is 12 to 16 feet. Loaded vessels should use the Black Rock Canal and lock to reach these wharves. The main channel of the Niagara River, through the draw of the International Bridge, could be but has not been used for years. The draw does not open for the passage of vessels. The current passing the guide pier below the Black Rock Lock creates a powerful eddy, the water flowing upstream along the U.S. side for more than ½ mile below the lock; allowance should be made for this counterflow in docking or in entering the marina basins.

Between **Strawberry Island** and the American shore at the head of the American or east channel, the current is about 3 miles per hour. The sides of the channels are marked by nun and can buoys, and the center lines by three ranges.

The channel above the reef, from the foot of Black Rock Lock to the turn at the head of Strawberry Island, is 400 feet wide and has a controlling depth of 21 feet. It is marked by the upper cut range of lights; the front light is on the right river bank, and the rear light is in Riverside Park, Buffalo, 800 feet north of the front light. The left side (looking downstream) is marked by buoys. Vessels should hold the upper range only from the angle downstream from the guide pier to a point about midway between buoy 5 and buoy 7. The angle at the turn into the lower channel is marked by a lighted buoy.

The lower channel across the reef is 400 feet wide and has a controlling depth of 21 feet. There is a slight angle in this channel, and it is marked by two ranges. The lower cut range lights guide through the channel from its upper prolongation; the front light is located on the east bank of the river, and the rear light on Fuller Street, Buffalo, about 750 feet 139½° from the front light. Grand Island Range Lights are in the downstream prolongation of the lower channel; the front light is on the east shore of **Grand Island** and the rear light is about 1,550 feet 313½° from the front. The lower channel is marked by a lighted buoy located near Strawberry Island and a lighted buoy at the downstream end of the channel and also by numerous unlighted buoys.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting sta-

Bridges Across Black Rock Canal

No.	Location and name	Kind	Miles north of North Breakwater South End Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	International	Railway and highway.	3.8	162.6	-------	-------	17.0	13	Swing. See note 3.
2	Ferry St. (United States).	Highway	2.6	-------	-------	149	17.3	-------	1-leaf bascule. See note 2.
3	Peace Bridge (Buffalo-Fort Erie).	do	2.0	-------	-------	200	100.3	96	Fixed. See note 1.

Signals for Opening Draws: No. 2, 1 long, 2 short (— . .). No. 1, 1 long (—) and bridge answers with the same signal. Bridge No. 2 is equipped for return signals and a whistle synchronized with a white light atop the control house on the immovable part of a bridge (see pars. (k)(1) thru (k)(6) of § 207.590 of Rules and Regulations, preceding).

NOTE 1.—Span of high level fixed bridge across canal; the clear width between abutments, normal to channel, is 334 feet.

Two red lights and one green light on each side of bridge, on bottom chord, the green lights over center of channel and red lights over each side of channel, 100 feet from green lights.

NOTE 2.—17.3 feet vertical clearance for a width of 86 feet from the left abutment thence decreasing to 12.3 feet at the right westerly abutment. One red light on upstream and downstream end of each abutment; one light showing red on upstream and downstream side of lifting end, swinging with lift and showing green when bridge is open.

NOTE 3.—The portion of the International Bridge between the American shore and Squaw Island.

One red light on each end of the west side of the draw opening near top of abutments, and one red light on south end of center rest pier. On the swing span, three lights on tower 8 feet above truss, one in center and one at each end, showing red up and down stream when the bridge is closed and green when open.

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tion is located at the Niagara Parks Commission Marina.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The town of Tonawanda submerged intake crib, having a least depth of 10 feet of water over it, is located approximately ½ mile upstream of Strawberry Island and approximately ½ mile westerly of the westerly limit of the deep draft navigation channel. A submerged pipeline connects the intake with the pumping station located on the east side of river about ½ mile upstream from the Niagara Mohawk Plant.

Water Intake.—The Niagara Frontier State Park Commission submerged intake crib, with a least depth of 6 feet, is located approximately 2¼ miles upstream of the South Grand Island Bridge and extends about 400 feet riverward of the shore line of Grand Island. A submerged pipeline connects the intake with the pumping station on Grand Island.

The Erie County Water Authority submerged intake crib, with a least depth of 11 feet, is about 600 feet eastward of Motor Island. A submerged pipeline extends across the channel, eastward from the crib, to shore.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake crib serving Grand Island, N.Y., is located 3,200 feet 269° from the tank on Grand Island at Beaver Island State Park. The crib is in about 14 feet of water and is not marked.

The Niagara Mohawk Power Corp.'s river plant and dock are located below Strawberry Island and about 1¼ miles north of Buffalo City line.

Submerged Cable.—The New York Telephone Co. has a submarine cable crossing the Niagara River about 2,600 feet northwest of Motor Island between the towns of Tonawanda and Grand Island. Vessels should not drag anchor in this vicinity.

The Roblin Industries, Inc. (former Lake Erie Rolling Mill) is located about 2½ miles north of the Buffalo City line. The Semet Solvay Co.'s dock is located upstream from and adjacent to the Roblin Indust. facility with a

channel dredged to a depth of 21 feet. The approach is from downstream and is marked on the riverward side by a buoy. Unloading machinery overhangs the dock face about 8 inches, making it necessary for vessels to approach with caution.

South Grand Island Bridge.—A high level fixed highway bridge with twin spans 125 feet apart, connecting the township of Tonawanda with Grand Island, crosses the east branch of the Niagara River about 2.5 miles downstream of Motor Island. The channel passes through the central spans which have a clearance of 99.5 feet. Vessels requiring the full height should keep at least 90 feet from the face of the piers.

Submerged Pipelines.—A 12-inch submerged pipeline of the Iroquois Gas Corporation crosses the river approximately 400 feet downstream of the South Grand Island Bridge. The pipeline is in a trench and has a least depth across the navigation channel of 35 feet.

A 12-inch submerged pipeline of the Lakehead Pipeline Company crosses the river approximately 1,150 feet downstream (North) of the South Grand Island bridge. The pipeline is in a trench and has a least depth of 42 feet across the navigation channel.

Aerial and Submerged Cables.—Two Niagara Mohawk Power Corp. aerial crossings with electric transmission cables having vertical clearances of 123 feet and 115 feet, are located about ¾ mile downstream from South Grand Island Bridge. Submarine cables cross the channel between the aerial cable towers.

Tonawanda Harbor, N.Y.—Situated about 12 miles via the Tonawanda channel below the head of the river at Horseshoe Reef is the western terminus of the New York State Barge Canal. This harbor comprises the river frontage of **Tonawanda** and **North Tonawanda, N.Y.**, extending ¾ mile above and 3 miles below **Tonawanda Creek**, which separates the two cities; also all of the waterfront of **Tonawanda Island**, which lies in the river off the main shore, and Tonawanda Creek from its mouth to the Main-Webster Street Highway Bridge connecting the Tonawandas, a distance of about 1,400 feet. This harbor frontage is occupied by fueling docks and several marinas. In June 1977, 8 to 13 feet was reported alongside the berths and gas docks.

The part of Tonawanda Harbor extending south from the North Tonawanda turning basin along the east side of Tonawanda Island has depths of about 15 feet with depths of 12 feet in Tonawanda Creek from the mouth to the highway bridge 0.2 mile above the mouth.

A **speed limit** of 5 m.p.h. is enforced in the harbor and in Tonawanda and Ellicott Creeks within the Tonawanda and North Tonawanda city limits. The **harbormasters** of both communities enforce these laws and can be contacted through their respective police departments.

Aids to Navigation.—A leading light marks a course slightly divergent from the centerline of the river channel. The light is on the river bank northward of the turning basin. The channel is also marked by buoys. A buoy marks the extremity of a shoal off the southwest end of Tonawanda Island.

Potable Water Intake.—See **42 U.S.C. 264**, published in Certain Laws, preceding, and **21 C.F.R. § 1250.93 of Rules** and Regulations, preceding. A potable water intake pipeline of the city of Tonawanda, N.Y., starts on the shoreline 6,800 feet 195° from the spire in North Tonawanda and extends 1,700 feet 270° to a crib in about 14 feet of water. There is a depth of 25½ feet of water over the pipeline. During the navigation season, a light is maintained on the crib at a height of 18 feet above the water.

A potable water intake pipeline of the city of North Tonawanda, N.Y., starts on the island shoreline 5,025 feet 202° from the spire in North Tonawanda and extends 1,200 feet 259° to a crib in about 15 feet of water. There is a depth of 25½ feet of water over the pipeline. During the navigation season, a light is maintained on the crib at a height of 19 feet above the water.

A potable water intake pipeline of the city of Lockport, N.Y., starts on the shoreline 2,470 feet 224° from the spire in North Tonawanda and extends 2,200 feet 254° to a crib in about 13½ feet of water. There is a depth of 22 feet of water over the pipeline. During the navigation season, a light is maintained on the crib at a height of 13 feet above the water.

Submarine Crossing.—Nine submarine cables cross the channel between the mainland and Tonawanda Island; one 1,000 feet upstream, three immediately upstream, two immediately downstream, and three about 2,000 feet downstream from the ConRail railroad bridge. Three intake pipes cross the channel between Tonawanda Island and the mainland; one immediately downstream and two about 2,900 feet and 3,200 feet downstream from the ConRail railroad bridge, with clearances over them of 24 feet, 22 feet and 22 feet, respectively.

New York State Barge Canal System Entrance.—Canal Entrance Light 1 is on the west side of the mouth of Tonawanda Creek. Canal Entrance Light 2 is opposite. In the harbor portion of Tonawanda Creek, Canal Entrance Light 3 is shown 6 feet above the water on a pile on the east side of the Barge Canal, and Canal Entrance West Light is shown 8 feet above the water on a pile on the west side of Barge Canal. These lights are maintained by the State of New York at the entrance to the Erie Canal of the barge-canal system from the Niagara River. (The New York State Barge Canal System is described under the heading Hudson River, New York Canals, and Lake Champlain immediately following the Lake Superior description.)

Bridge Regulations.—See **33 U.S.C. 449**, published in Certain Laws, preceding, and **33 C.F.R. § 117.190** of Rules and Regulations, preceding.

Dumping Along Grand Island Shore.—Material dredged from the Government channel was dumped along the Grand Island bank between the Lockport waterworks intake crib and the former Edgewater dock which is in ruins.

Niagara Falls, N.Y.—The Public Dock of Niagara Falls is located about 3½ miles above the Falls, by the American channel, about 17 miles from the foot of Ferry Street at Buffalo or 6¾ miles from Tonawanda Island, and about 3,500 feet downstream of the North Grand Island Bridge.

A dredged channel, Niagara River Channel, leads from

Bridges Across Tonawanda Harbor and Tonawanda Creek

No.	Location and name	Kind	Miles below mouth of Tonawanda Creek	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Tonawanda Island-Frederick B. Durkee Memorial bridge.	Highway	0.29	-------	-------	200	14.5	-------	Fixed. See note 1.
2	Tonawanda Island bridge. Tonawanda Creek	Railway	.22	66.5	67.7	-------	10.7	-------	Swing. See note 2.
		Miles above mouth of Tonawanda Creek							
3	Tonawanda Creek bridge	Railway	.10	66	61	-------	9.2	-------	Swing. See note 3.
4	do	Highway	.16	-------	-------	110	24.0	-------	Fixed. See note 4.
5	do	do	.25	-------	-------	99	17.0	-------	Fixed. Under Construction.

Signal for Opening Draws, 3 blasts (— — —).

Note 1.—14½ feet clear height is for width of 148 feet through center of opening. Lights up and down stream, green in the center and red at each side of the channel.

Note 2.—Current about 3 miles per hour. Three red lights on center line of top of swing span, one at each end and one at center.

Note 3.—The bridge stands open except when switching cars. Three lights on center line of top of swing span, one at each end and one at the center, showing red up and down stream when bridge is closed and green when it is open.

Note 4.—A green light on both the upstream and downstream sides of the bridge, marks the center line of the 100-foot channel through the bridge. Two red lights on both the upstream and downstream sides of the bridge, suspended at the clearance limit, mark the edges of the 100-foot channel.

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the lower end of the turning basin at North Tonawanda along the north side of Grand Island to a basin off the public dock at Niagara Falls. In 1970, the controlling depth of the channel was 11 feet. The channel is marked by buoys.

Buckhorn Island, N.Y.—This island is at the northwest end of Grand Island opposite Niagara Falls, N.Y. A 2-section permanent flow control dike, constructed in 1960, extends 2,100 feet northwesterly from the westerly end of Buckhorn Island closing off the former Buckhorn Channel. The south section of the dike is 1,000 feet long and marked at the riverward end with Light No. 3. The south end of the north section of the dike, marked with Light No. 2, is located 200 feet west of Light No. 3, and extends 1,150 feet to Light No. 1 at the most northerly point of the dike.

Dumping Along Grand Island Shore.—Material dredged from the Government channel has been dumped along the Grand Island bank south of the improved channel at two locations where marked by buoys 11, 13, 17, 19 and 21, about 1½ miles and 3¼ miles, respectively downstream from Edgewater dock. No vessel or craft should pass between the above buoys and the Grand Island shore.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, in 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. Two pipelines of the Niagara County Water District cross the river about 3,000 feet upstream of Cayuga Island. The 16-inch and 42-inch lines are laid in a trench with a depth over them of 24 feet at the navigation channel crossing.

An intake crib (inner) for the Niagara Falls, N.Y., water supply is located in the Niagara River in 15 feet of water, 1,200 feet out from the mainland shore, opposite the public dock. The crib is 24 feet wide; its total length is 92 feet, of which a part is submerged and a part projects 7 feet above water. A water pipe, with its top 23 feet below river level, extends from the crib to shore. A light is maintained on the crib by the city.

Another intake crib (outer) for the City of Niagara Falls, N.Y., is located between Navy Island and Buckhorn Island at a point about 1,900 feet 185½° from Niagara Mohawk Transmission Line Light "C". A light is mounted on top of the crib structure.

An intake crib for the Hooker Chemical Corp., located between Grand and Navy Islands is 2,500 feet 078° from the southerly tip of Navy Island and 200 feet offshore of Grand Island. A light is maintained on the crib by the corporation. An outflow crib of the same corporation, lighted similarly, is located 800 feet downstream from the North Grand Island Bridge and 150 feet offshore on the north side of Buckhorn Island.

Aerial Cables.—The Niagara Mohawk Power Corp., aerial crossing No. 1, with electric transmission cables having a vertical clearance of 75 feet, is marked by two lights on the piers supporting high towers carrying the cables from Niagara Falls to Grand Island. Each light is shown 20 feet above water on a standard in the center of the pier. Light B is 200 feet 272°, and Light C is 1,575 feet 179° from Niagara Falls water-intake crib (inner).

Another aerial cable crossing of the Niagara Mohawk Power Corp. is located upstream from crossing No. 1, extending from a point on the north shore of Buckhorn Island about 2,300 feet downstream from the North Grand Island Bridge to a point on the mainland shore 2,600 feet downstream from the bridge. A center supporting crib and tower structure is located 1,400 feet 030° from Light "C". The cable has a least vertical clearance of 79 feet at mean river level.

Little River at **Cayuga Island,** Niagara Falls, N.Y., about 5 miles downstream of Tonawanda Island, flows from the Niagara River and between Cayuga Island and the mainland for a distance of about 1.5 miles entering the Niagara River again at the lower end of the island at **La Salle,** which has been annexed to Niagara Falls, N.Y. The Little River, and **Cayuga Creek** which flows into Little River at about the midpoint in the length of the island, afford a well protected harbor for small boats, with depths of 4 to 7 feet inside with 7 feet of water in the lower entrance channel but only one foot in the upper entrance.

A dredged channel leads from deep water in Niagara River through the lower entrance to Little River. In 1977, the reported controlling depth was 5 feet.

A fixed bridge connects Cayuga Island with the mainland at the foot of South Eighty-sixth Street, Niagara Falls; it has a clear height of 11.7 feet for a width of 77 feet normal to the axis of the channel.

An aerial cable with a vertical clearance of 55 feet, crosses the channel about 2,000 feet west of the bridge.

A fixed bridge crosses Cayuga Creek at Eighty-eighth Street, Niagara Falls, N.Y.; it has a clear height of 9.7 feet for a width of 77 feet normal to the axis of the channel.

La Salle Yacht Club Inc., located on the mainland about 0.5 mile downstream of Cayuga Island, maintains two lights, each 8 feet above the water. The two lower lights mark the upper and lower limits of the dock at the club moorings about 5,300 feet 060° from Niagara Mohawk Power Transmission Line Light "C".

North Grand Island Bridge.—A fixed highway bridge with twin spans 84 feet apart, connecting Sixty Fourth Street in Niagara Falls with Grand Island, crosses the east branch of the Niagara River about 0.7 mile downstream from Cayuga Island. The 11-foot deep channel passes through the central spans, which have a minimum clearance of 46.5 feet.

Navigation Regulations.—Restricted Navigation Area United States Waters.—See **33 CFR § 162.180** of Rules and Regulations, preceding.

Prohibited Navigation Area.—His Excellency the Governor General in Council, on the recommendation of the Minister of Transport pursuant to section 645 of the Canada Shipping Act is pleased hereby [Canada Gazette, Part 2, Volume 96 (page 936) dated September 12, 1962, No. 17] to make the annexed Regulations Respecting Navigation on the Upper Niagara River.

Canadian Regulations Respecting Navigation on the Upper Niagara River

1. These Regulations may be cited as the *Upper Niagara River Regulations.*

2. In these Regulations,

(*a*) "Upper Niagara River" means the Canadian Waters of the Niagara River between the crest of Horseshoe Falls at Niagara Falls, Ontario, and the Peace Bridge at Fort Erie, Ontario; and

(*b*) "vessel" means any ship or boat or any other description of vessel used or designed to be used in navigation.

3. No vessel shall navigate the Upper Niagara River downstream of a straight line joining the end of the breakwater at the mouth of the Welland River to the Westerly side of the mouth of Gill Creek at Niagara Falls, New York, except for the purpose of saving life in an emergency.

4. The Minister of Transport may exempt any vessel from compliance with these Regulations.

5. (1) A person who violates the provisions of section 3, is guilty of an offence and liable on summary conviction to a fine not exceeding five hundred dollars.

(2) A person who

(*a*) operates any vessel contrary to the provisions of section 3;

(*b*) is a party to any act described in paragraph (*a*); or

(*c*) is the owner, charterer, hirer, master or person in charge of a vessel that is operated contrary to the provisions of section 3

shall be deemed to have violated those provisions unless, in any prosecution for such violation, he establishes that the act in respect of which the prosecution has been commenced took place without his consent and that he exercised all due diligence to prevent its commission.

Chippawa, Ontario.—Situated at the junction of the Welland River with the Niagara River, this community is about 1¾ miles above Niagara Falls, about 15 miles via the Canadian channel from the foot of Ferry Street, Buffalo, and about 8¼ miles via the Welland River from Port Robinson on the Welland Canal.

Welland River is 50 to 100 feet in width. At its junction with the Niagara River are the intake structures of the Queenston plant of the Ontario Hydro-Electric Power Commission, with a small boat channel on the south side thereof. Due to the intake structures, the flow of the Welland River has been reversed and is now from the Niagara River. Mariners are cautioned that the current in the Niagara River at the entrance is very strong. From this point for about 4 miles upstream the commission has dredged the river to 30 feet depth, but beyond this the controlling draft is about 6 feet.

7. DETROIT RIVER

Depths and vertical clearances under aerial crossings and bridges herein given are referred to the sloping surface of the river corresponding to a Lake St. Clair stage of 571.7 feet and a Lake Erie stage of 568.6 feet above mean water level at Pointe-au-Pere (Father Point), Quebec, on International Great Lakes Datum (1955), which elevations are the planes of Low Water Datum for the two lakes.

GENERAL DESCRIPTION

Physical Conditions.—The Detroit River has a length of about 32 miles from the Detroit River Light at its mouth in Lake Erie, to Windmill Point Light at the river's junction with Lake St. Clair, its head.

The southerly or lower river is broad and is characterized by many islands and shallow expanses; in this portion the banks are more flatly sloping than in the upper river, and the bottom consists generally of earth and boulders with the exception of about 6 miles north of the south end of Bois Blanc Island, where the bottom is mainly bedrock and boulders. The limitations imposed by the natural formation of the lower river bed have necessitated very extensive rock excavation and dredging to provide channels of suitable width and depth for the large vessels engaged in lake commerce.

For the northerly or upper 13 miles, or from the head of Fighting Island, the river is of unbroken cross section except directly at its head, where it is divided by Peach Island and Belle Isle; in the upper River the water is generally deep, the bottom is of earth and the channel banks are quite steep.

Anchoring of Vessels.—Cautionary Notice.—When coming to anchor vessels masters are cautioned not to foul submarine cables. Fouling cables may not only result in disrupting utility services to adjacent communities but also expose the mariner to the danger of high voltages carried by certain cables. Mariners are advised to slip the anchor rather than cut the cable if the normal practice of good seamanship fails to clear the fouled anchor. Lost gear or damaged cables should be reported to the authority having jurisdiction over the waterway.

Channels.—The junction of the Detroit River and Lake Erie has two channels. From the east, the East Outer Channel, a two-way passage, extends from deep water in Lake Erie to the Detroit River Light. West Outer Channel passes west of Detroit River Light to the deep water in the lake. Vessels of moderate draft bound for Monroe or Toledo may use West Outer Channel.

Above Detroit River Light, lower Livingstone Channel is a two-way passage to the junction of Livingstone and Amherstburg Channels opposite Bar Point. From Bar Point to Ballards Reef Channel, there are two channels; Amherstburg Channel for upbound traffic and Livingstone Channel for downbound traffic. Ballards Reef and Fighting Island Channels lead from the upper junction of Amherstburg and Livingstone Channels to the north end of Fighting Island. From here natural water in the river may be carried to the upper end of Belle Isle, thence a dredged channel leads to Lake St. Clair.

Details of the various river channels are given in the "Local Descriptions" following. The channels are marked by numerous lights and buoys.

Charts.—The entire length of the Detroit River is shown on charts 14848, 14849, and 14853. The Trenton Channel and River Rouge are also shown on Chart 14854.

Current Velocities.—The following current velocities are based on the averages of water flow through the entire cross-section of the river, that is, from bank to bank and from the surface to the bottom during normal water flow conditions. Normal water flow conditions are encountered when there is no wind, Lake St. Clair is at a stage of 573.2 feet, and the lower Detroit River (Lake Erie) stage is 569.8 feet above mean water level at Pointe-au-Pere (Father Point), Quebec, on International Great Lakes Datum (1955), that is, +1.5 feet and +1.2 feet above their respective Low Water Datums. The current encountered at midstream is usually about 1.5 times the average velocity. Greater velocities may be expected when the differences between the lake levels are greater, or when the lake stages are higher. When extreme conditions have existed, i.e., the lower Detroit River (Lake Erie) stage is higher than Lake St. Clair stage, the current flow has reversed. The following are approximate average velocities through the indicated reaches: Amhertsburg Channel: 1.4 mph between lights 49D and 51D, 2.0 mph at light 75D; Livingstone Channel: 1.7 mph between Lights 13 and 19, 2.3 mph between Lights 21 and 25; 1.3 mph at the head of Grosse Isle; 1.6 mph at the Ambassador Bridge; Belle Isle: 1.2 mph at the foot, 1.4 mph at the head; and 1.3 mph at Windmill Point.

Fluctuations of Water Level.—Each year the river rises and falls about 2 feet as measured by the monthly

mean levels. Since 1900, the difference between the highest and the lowest monthly mean levels has been about 5 feet. However, occasional fluctuations in depth of several feet, produced by high easterly or westerly winds, respectively raise or lower the water level at the west end of Lake Erie and similarly affect the level of the lower Detroit River; such changes have been as much as 6 feet within 8 hours. Water level fluctuations of a foot or more may occur with atmospheric pressure changes. Stage changes or water level differences in Lake Erie and Lake St. Clair may affect river flow velocities.

Weather Conditions.—The highest wind velocity registered in the Detroit, Mich., area was 83 knots (95 mph) from the northwest in June 1890. At Windsor, Ont. (Airport) the highest wind sustained for one minute was from the SW at 49 knots (57 mph) on 15 March 1959. The maximum gust ever observed was 81 knots.

Navigation Regulations.—See 33 C.F.R. § 162.135 of Rules and Regulations, preceding.

Pilotage Regulations.—See 46 U.S.C. 216–216i published in Certain Laws, preceding and 46 C.F.R. § 401 (in part) of Rules and Regulations, preceding.

Pilot Dispatch Offices.—The Welland Canal, Lake Erie, Detroit River, Lake St. Clair, and St. Clair River, in Great Lakes Pilotage District No. 2, are serviced by the following dispatch offices:

Great Lakes Pilotage Authority, Ltd.
P.O. Box 2008, Station B
St. Catherines, Ontario, Canada
416–934–2921

Lakes Pilots Association
P.O. Box 902
Port Huron, Michigan 48060
313–984–2541

For vessels requiring pilotage service, the nearest pilot dispatch office is notified 12 hours ahead with a follow-up confirmation 4 hours in advance.

LOCAL DESCRIPTIONS FROM THE MOUTH OF THE RIVER TO THE HEAD

Charts 14830, 14848, 14849, 14853, 14854.—The southerly end of the Detroit River, or the mouth of the river, flows into the northwesterly end of Lake Erie.

Detroit River Light, 55 feet above the water, on a white conical tower on a hexagonal pier in 20 feet of water, is at the entrance of the Detroit River from Lake Erie. A fog signal and a radiobeacon are at the light.

Channels.—Channels which connect upper Lake Erie and the lower Detroit River are East Outer Channel and West Outer Channel. The above channels merge into the lower Livingstone Channel above Detroit River Light. The channels are well marked with buoys. In 1975–1976, East Outer Channel had a controlling depth of 27 feet at midchannel. In 1977, West Outer Channel had a controlling depth of 16 feet at midchannel.

East Outer Channel is a two-way passage. West Outer Channel may be utilized by downbound vessels whose draft permits. See 33 U.S.C. 162.165 of Rules and Regulations preceding.

From Detroit River Light, lower Livingstone Channel provides for two-way traffic to the lower junction of Amherstburg Channel and upper Livingstone Channel. In 1974, the controlling depth was 28 feet at midchannel.

Low Water Warnings.—The U.S. Coast Guard, Group Detroit, broadcasts low water warnings on VHF–FM channel 12 (156.60 MHz) on the odd hour plus 55 minutes when the water level in the west end of Lake Erie falls one inch or more below the lower level of the Corps of Engineers, Detroit District predicted range of levels shown in bulletins issued the 5th and 20th of each month during the navigation season. An occulting amber light is shown from Detroit River Light during these conditions. When the water level is at or above the lower level of the predicted range, a fixed amber light is shown from Detroit River Light.

Dumping Grounds Regulations.—See 33 U.S.C. 419, published in Certain Laws, preceding, and 33 C.F.R. § 205 of Rules and Regulations, preceding.

In addition to the authorized dumping ground, there is a temporary dumping ground within the area between the converging East and West Outer Channels: this dumping ground is not marked.

The nearest land mass to the Detroit River Light is located to the west. This area is the Pointe Mouillee Game Area and includes the mouth of the Huron River.

Huron River, Mich.—This river is at the head of Lake Erie and the mouth of the Detroit River, and about 1¼ miles north of Pointe Mouillee, Mich. At the mouth, the river runs through marshy land; the least depth over the bar is 2 feet; inside of the bar the depth is 5 to 13 feet; the 12-foot contour is about one mile out from the mouth. Service facilities for small craft are available below the Jefferson Avenue bridge.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 82, Wayne county.

R 281.782.3. Huron river, channels and bayous; slow—no wake speed.

3. On the waters of the Huron river and the natural and artificial channels and bayous in sections 23, 24 and 25, P.C. 636, town 5 south, range 10 east, Brownstown township, Wayne county. * * *

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding.

R 281.782.4. Silver creek, bayous, estuary, canals and channels; slow—no wake speed.

4. On the waters of Silver creek, its bayous and estuary

and connected artificial and natural canals and channels in sections 14, 15, 23 and 24, and P.C. 636, town 5 south, range 10 east, Brownstown township, Wayne county. * * *

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding.

R 281.782.5. Maple and Millerville beaches, canals and channels; slow—no wake speed.

5. On the waters of the artificial and natural canals and channels, Maple and Milleville beaches, in sections 13 and 24, and P.C. 636, town 5 south, range 10 east, Brownstown township, Wayne county. * * *

Charts 14848, 14853.—Amherstburg (Upbound) Channel, Ont.—This is the upbound channel on the Canadian side of the river eastward of Bois Blanc Island. Between the southerly junction with Livingstone Channel opposite Bar Point and the northerly junction with Ballards Reef Channel, a distance of about 6¼ miles, the channel follows through Hackett Reach, Amherstburg Reach, and the Limekiln Crossing Reach, all appropriately marked by lights and buoys.

Speed of Vessels.—Canadian Public Harbour Regulations, issued under Pt. 10 of the Canada Shipping Act for the Harbour of Amherstburg, Ont., Section 72.(3b), specify "No vessel of 15 gross tons or over shall navigate the Amherstburg Channel between Bar Point Pier Light 29D and Livingstone Channel Upper Entrance Light at a speed exceeding ten statute miles per hour over the bottom".

Caution When Anchoring.—Care should be exercised by vessels when anchoring in that part of the Amherstburg Channel between Ballards Reef and the south end of Bois Blanc Island. The current at this locality may cause the anchor to drag and overturn rocks which may then become obstructions. Such dragging of anchors can probably be lessened or entirely avoided by paying out sufficient length of chain before strain is brought to bear on the anchor.

Amherstburg Channel comprises three reaches. **Hackett Reach** extends about 3.7 miles northeasterly from the junction with Livingstone Channel to the lower end of Bois Blanc Island, thence **Amherstburg Reach** extends about 1 mile to the upper end of Bois Blanc Island, and thence **Limekiln Crossing Reach** extends about 1.2 miles to the junction with Ballards Reef Channel.

The channel through each of the reaches is 600 feet wide. The western half of the channel is the deep-draft channel and is separated from the eastern or light-draft channel by lighted buoys. The Federal project depth in the western half of the channel is 28½ feet in Hackett Reach and 27½ feet in Amherstburg and Limekiln Crossing Reaches with 21 feet in the eastern half through the entire channel. The channel is maintained at the project depths except in the lower 2 miles of Hackett Reach where, in 1975, the midchannel controlling depths were 22 feet in the western half and 19 feet in the eastern half.

The channel is well marked by lights and lighted and unlighted buoys. The deep-draft channel is marked by a lighted range in each reach.

Mariners are advised to exercise caution when turning from Hackett Reach into Amherstburg Reach because of current effects.

Submerged Cables.—A submerged high voltage cable extends along the western edge of Hackett Reach channel. Small craft are cautioned not to anchor over the cable.

An unburied submarine cable crosses the lower end of Amherstburg Reach from the Amherstburg shore westerly to a point just below the Bois Blanc dock.

An unburied submarine cable crosses Limekiln Crossing Reach just above the Fort Malden Range Lights.

Bois Blanc Island, Ont.—This island, which is popularly known as Bob-Lo Island, is an island in the lower section of the Detroit River. It is about ¼ mile west of the Canadian shoreline and is about 1½ miles long and about 1,500 feet wide. The Island is primarily a large amusement park and has a dock on the easterly side for the large passenger boats making regular trips during the open season from the end of May until the beginning of September. A small craft area is located on the south side of the big dock, but no small craft services are available. Small boat facilities are also located on the west side of Bois Blanc and offer marine services.

Amherstburg, Ont.—A town located near the mouth of the Detroit River, opposite Bois Blanc Island; port of entry and customhouse. The docks are old and dilapidated. Dredging has provided a depth of about 15 feet along the entire dock frontage and connecting with the deep main river channel. A steel sheet pile public wharf 250 feet long and a warehouse are located about 190 feet south of the old wharves. Dredging was carried out between this wharf and the main channel to a depth of 16 feet in 1958. A small craft reporting station and steel sheet pile wharf 92 feet long was constructed in 1966.

Amherstburg, Ont.—Harbor Limits.—The harbour limits of Amherstburg, Ont., have been redefined (1974) and the new limits are as follows:

"All the waters of the Detroit River and of Lake Erie on the Canadian side of the International Boundary south of the southerly limit of Windsor Harbour and west of the meridian of longitude 83°05′00″ W."

NOTE I: The approximate location of the southerly limit of Windsor Harbour is a straight line drawn from Fighting Island North light at the International boundary in a 046°30′ direction to the high water mark on the shore.

NOTE II: The purpose of this change in the Amherstburg Harbour limits is to place the Detroit River Anchorage area wholly within the limits of Windsor Harbour, which is under the sole jurisdiction of the Windsor Harbour Commission.

Ballards Reef Channel is about 3.5 miles long from its lower end junction with Amherstburg Channel to its upper end junction with Fighting Island Channel. Upper Livingstone Channel joins Ballards Reef Channel about 1 mile above the latter's lower end. Below its junction with Livingstone Channel, Ballards Reef Channel is normally used for upbound traffic, and above the junction it is used for upbound and downbound traffic.

Ballards Reef Channel is well marked by lights, lighted and unlighted buoys, and by a lighted range at each end. The channel is maintained at its project depths of 27 feet below the junction with Livingstone Channel and 28 feet above the junction.

An auxiliary channel for light-draft vessels adjoins the east side of Ballards Reef Channel. It is marked by buoys and has depths of about 14 feet.

Livingstone (Downbound) Channel.—The upper part of Livingstone Channel, passing to the eastward of the lower half of Grosse Ile and to the westward of Bois Blanc Island, is about 6.7 miles long from its north entrance at Ballards Reef Channel to its southerly junction with Amherstburg Channel opposite Bar Point. This section of Livingstone Channel is for use by downbound vessels. The greater part of the channel is revetted on both sides with rock excavated from the channel. Most of the revetment is low and wooded.

The channel is well marked with lights and buoys. Ballards Reef Channel Light 81D marks the west side of the downbound turn into the entrance to Livingstone Channel at its junction with Ballards Reef Channel. Due to the strong easterly set of the current at the junction of Livingstone and Ballards Reef Channels, mariners are advised to favor the western channel edge.

Northward from its junction with Amherstburg Channel to the lower end of the channel revetments, Livingstone Channel has a Federal project depth of 29 feet. In 1974, the midchannel controlling depth in this section was 28 feet. Above the lower end of the channel revetments to the junction with Ballards Reef Channel, Livingstone Channel is maintained at its project depth of 27 feet.

Various forms of submerged and exposed compensating works extend to the west from the west channel revetment, connecting with Stony Island in the north part and extending to within about 400 feet of Sugar Island at the midpoint of the channel.

Submerged cables.—A submerged electric cable extends about 2,000 feet 344° across Livingstone Channel from the Upper Entrance Light to Light 81D. Another submerged electric cable extends about 3,000 feet 117° across Ballards Reef Channel from Light 81D to the Ontario mainland.

There is a small craft channel passing west of Stony Island, along the Grosse Ile shore, which also passes west of Sugar Island and on into the open part of the Lower Detroit River. In the narrow part of this channel between Stony Island and Grosse Ile, a line of submerged bridge abutments with least depths of ½ foot, crosses the channel and submerged cables follow the same path just to the south and north of the abutments. A buoy marks the west side of the most westerly crib and, in 1977, the best water was inside the buoy within 150 to 200 feet of the Grosse Ile shore. The westerly abutment is about 280 feet from shore. Another submerged cable crosses this channel from Sugar Island to Meso Island on the west.

Sugar Island Cut, about 400 feet wide, is an opening between the east side of Sugar Island and a compensating revetment that extends westward from the west revetted wall of Livingstone Channel.

Hole-in-the-Wall, westward of the north end of Bois Blanc Island, is about a ¼-mile gap in the revetted walls of Livingstone Channel which allows small craft to cross the main channel to the Canadian side of the Detroit River. There is a strong westerly current through Hole-in-the-Wall; caution is advised.

Light 19, 34 feet above the water, on a small house on the north end of the west revetment, marks the south side of Hole-in-the-Wall. Protective riprap extends horizontally out from the base of the structure about 30 feet and should not be passed close aboard even by vessels of shallow draft.

Numerous small craft have reported striking two submerged obstructions between the west side of Bois Blanc Island and Livingstone Channel revetment. Caution is advised.

Grosse Ile, Mich.—Grosse Ile is the largest island in the Detroit River. It is about 8 miles long and about 1½ miles wide, extending from about the mid-point of the Upper Livingstone Channel at the south end to about the mid-point of the Fighting Island Channel opposite the City of Wyandotte, Mich., at the north end. The main ship channel passes to the east of the island while the westerly channel of the river, passing west of the island, has been dredged for deep draft navigation from the north down to a point about 2½ miles above the lower end of the island. This dredging has developed the Trenton Channel. Below the south end of the Trenton Channel, the natural river has no deep draft navigable channel into the lower river below Grosse Ile. Small craft can proceed into the lower section of the river through one of the two natural channels.

The southerly one third of Grosse Ile was occupied primarily by the Grosse Ile Naval Air Station. The Grosse Ile Naval Air Station was decommissioned on November 24, 1970 and was turned over to the Township of Grosse Ile on April 1, 1971. The former Naval Air Station is presently being operated as the "Grosse Ile Municipal Airport". The northerly two thirds of the island is occupied primarily by private homes and facilities. The most northerly ½ mile of the island is however a waste bed of manufacturing plant residue. No commercial waterborne commerce is handled on the island, and there are no public small-craft facilities.

The Thorofare Canal, a large shallow drainage ditch about 3½ miles long, crosses the body of the island in a southwest—northeasterly direction. Several island highway bridges cross this ditch and passage should not be attempted without local knowledge.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 82, Wayne county.

R 281.782.6. Detroit river and connected waters, Grosse Ile township; slow—no wake speed.

6. On the waters of the Detroit river and connected waters, town 4 south, range 11 east and town 5 south, range 11 east, Grosse Ile township, Wayne county, it is unlawful for the operator of a vessel to exceed a slow—no wake speed when within 1000 feet of any shore, dock or pierhead.

R 281.782.10. Swan Island Canal; slow—no wake speed.

7. On the waters of the Thorofare canal, P.C. 549, 550,

551 and 555, town 4 south, range 11 east, Grosse Ile township, Wayne county, * * *

R 281.782.8. Frenchman creek and connected waters; slow—no wake speed.

8. On the waters of Frenchman creek; passages east and west of Round island and the connected artificial canal, town 4 south, range 11 east, town 5 south, range 11 east, Grosse Ile township, Wayne county, * * *

R 281.782.9. Meso-Hickory passage; slow—no wake speed.

9. On the waters of the passage between Meso and Hickory islands, town 5 south, range 11 east, Grosse Ile township, Wayne county, * * *

R 281.782.10. Swan Island Canal; slow—no wake speed.

10. On the waters of the canal between Swan island and the mainland of Grosse Ile, town 4 south, range 11 east, town 5 south, range 11 east, Grosse Ile township, Wayne county, * * *

R 281.782.11. Elba island canal; slow—no wake speed.

11. On the waters of the natural and artificial channels and canals adjacent to Elba island, P.C. 553, 554 and 557, town 4 south, range 11 east and town 5 south, range 11 east, Grosse Ile township, Wayne county, * * *

About 1 mile above the northerly end of the Livingstone Channel, a natural channel leads upstream between Fighting Island on the west, and the Ontario mainland on the east. There are several channels in this main river channel caused by shoal areas and small islands, but they all merge back into the main channel which in turn merges into the main Detroit River navigation channel above the northerly end of Fighting Island. Only the most southerly end of this channel along the Canadian shore is buoyed. The community of **La Salle, Ontario** is located opposite the upper end of this channel. Several submerged cables cross the channel from La Salle to Fighting Island.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is at LaSalle and at the Trade Winds about ½ mile south of LaSalle opposite Grass Island.

Charts 14848, 14853.—Fighting Island, Ont.—This island is located in the lower Detroit River on the east side of the main ship channel. It is about 4 miles long and about ½ mile wide. The entire island area is either marsh or waste bed fill from various concerns pumping manufacturing residue to the island as waste. Low bluffs are on the west side of the island.

Fighting Island Channel extends from the upper end of Ballards Reef Channel about 2 miles below the head of Grosse Ile along the west side of Fighting Island to the natural deep water north of Fighting Island. The channel is maintained at the Federal project depth of 28 feet and is well marked by lights and buoys.

Anchorage Grounds.—An area of deep water adjoining the west side of the Fighting Island Channel at its southerly end, on a prolongation of the Ballards Reef Channel, is accessible as an anchorage ground when conditions are unfavorable for proceeding through the confined deep channels leading thence southward into Lake Erie. Vessels using this anchorage should be careful to avoid the long shoal extending below Mamajuda Island to a point about 700 feet south of the latitude of Grosse Ile south channel range front lights, its extremity being marked by a buoy. The westerly limits of the anchorage area are marked by buoys.

From the northwesterly section of the anchorage grounds, a buoyed channel about 250 feet wide and 21 feet or more in depth extends about 2 miles generally in a northerly direction between **Pt. Hennepin** on the west at the upper end of Grosse Ile, and the **Mamajuda Island Shoal** area west of **Mamajuda Island** Light. The northerly end of the channel merges with the Trenton Channel opposite the city of Wyandotte, Michigan. The controlling depth through the middle of this lower channel is 22 feet.

Salt wells at the south end of Mamajuda Island Shoal are marked by private lights.

Potable Water Intake.—See **42 U.S.C. 264**, published in Certain Laws, preceding, and 21 **C.F.R.** § 1250.93 of Rules and Regulations, preceding. A pipeline of the Wayne County Water Authority starts on the Michigan shore about 1,800 feet south of the Ecorse River mouth and extends approximately 5,350 feet 102°30′ under Wyandotte Reach of the Trenton Channel, Grassy Island, and Fighting Island channel to an intake crib 60 by 150 feet located 200 feet east of and paralleling the Fighting Island East Channel line or International Boundary Line. The intake structure is marked at each end with a light. A fog horn is maintained on the structure.

Ecorse Channel, Mich.—Ecorse Channel is a natural channel following the southwesterly curve of the Michigan shore from the upper end of the Trenton Channel-Fighting Island Channel junction, to its lower junction with the Trenton Channel. It is a narrow channel of deep water, marked by buoys, and lies along the river front inside the Mud Island and the bank, but the available depth is limited to 13 feet in the north entrance to this channel.

Ecorse, Mich.—A city at the mouth of Ecorse River, and on the Ecorse channel of the Detroit River, 3 miles below the River Rouge. The ConRail and Detroit, Toledo & Ironton Railroads pass through the city.

Trenton Channel, Mich.—West of the north end of the Fighting Island North Light, a natural channel extends from the main ship channel to a point just below the Ecorse River and continues along the Michigan shore line. This channel has been improved and buoyed to accommodate deep draft navigation interests and in its entire length from the main river ship channel to the turning basin below Trenton, Michigan, is now known as the Trenton Channel.

In 1971–1977, the controlling depths were 26 feet at midchannel from the junction with Fighting Island Channel for 6 miles to the turning basin above Trenton with 27 feet in the basin, thence 19 feet at midchannel to the turning basin below Trenton with 21 feet in the basin.

The navigable depth from the lower end of the Trenton channel turning basin down the back channel to the mouth of the river and Lake Erie is limited to about 6 feet through narrow and crooked channels.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 82, Wayne county.

R 281.782.14. Detroit river, city of Trenton; slow—no wake speed.

14. On the waters of the Detroit river, within the corporate limits of the city of Trenton, Wayne county, town 4 south, range 11 east, it is unlawful for the operator of a vessel to exceed a slow—no wake speed, when within 1000 feet of any shore, dock or pierhead.

R 281.782.15. Natural and artificial channels and canals, city of Trenton; slow—no wake speed.

15. On the waters of all artificial and natural channels and canals, within the corporate limits of the city of Trenton, Wayne county, town 4 south, range 11 east, * * *

Wyandotte, Mich.—A manufacturing city, with a river front of 3 miles, situated on the Trenton channel opposite and above Point Hennepin at the head of Grosse Ile, and 4 miles below the Rouge River. There are many important industries and good water along the docks and river front.

From the works of the BASF Wyandotte Corporation, located in the north part of Wyandotte, several pipelines, placed in a trench, extend to Fighting Island, the location being indicated by a sign displayed near the channel on the east side. Vessels are requested not to anchor near the pipelines.

Harbor Facilities.—Public dockage and most small-craft supplies and services are available.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 82, Wayne county,

R 281.782.16. Detroit river, city of Wyandotte; slow—no wake speed.

16. On the waters of the Detroit river, within the corporate limits of the city of Wyandotte, Wayne county, town 3 south, range 11 east, it is unlawful for the operator of a vessel to exceed a slow—no wake speed when within 1000 feet of any shore, dock or pierhead.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline starts on the shoreline 6,100 feet 337° from Mamajuda Light and extends 1,400 feet 087° to an intake crib in about 18 feet of water. There is a depth of 17 feet over the crib and it is not marked.

Bridge.—The Grosse Ile Bridge Co. highway toll bridge located just below Wyandotte crosses the Trenton channel to Grosse Ile, with a clear channel width of 125 feet and a clear height of 10 feet on each side of the center pier. This is a swing bridge and the signal for opening is 3 blasts.

One mile downstream from the toll bridge is the dock of the McLouth Steel Corp. The approach to the dock from the channel has been dredged by the corporation. Soundings in April 1968, showed a controlling depth of 28 feet between the dock and the channel and along the dock.

Trenton, Mich.—A city having a river front of about one mile, situated on the west bank of the Trenton channel, opposite Grosse Ile, and about 10 miles below the Rouge River. Docks and approach channels have been constructed by local industries. There is railroad connection with Wyandotte and Detroit.

Bridge.—The Wayne County Highway Bridge just below Trenton, crossing the channel to Grosse Ile, is of swing type, with a clear channel width of 150 feet on each side of the center pier and clear height of 18.9 feet.

This bridge is about 3¼ miles downstream from the bridge below Wyandotte, above described. Signal for opening bridge, 3 blasts.

Charts 14848, 14853.—Gibraltar, Mich.—This city is on the west bank of the Trenton channel about 4 miles below Trenton, and opposite the lower end of Grosse Ile.

Aids to Navigation.—The entrance channel is marked by a private 239° lighted range. The range should be followed closely due to rocks along the south side of the channel.

Marine Services.—Marinas with facilities for repairs, storage and fueling are located in the northern part of the City of Gibraltar.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding, Regulation No. 82, Wayne county.

R 281.782.12. Detroit river, city of Gibraltar; slow—no wake speed.

12. On the waters of the Detroit river, within the corporate limits of the city of Gibraltar, Wayne county, town 4 south, range 10 and 11 east, town 5 south, range 10 and 11 east, * * *

R 281.782.13. Natural and artificial channels and canals, city of Gibraltar; slow—no wake speed.

13. On the waters of all artificial and natural channels and canals, within the corporate limits of the city of Gibraltar, Wayne county, town 4 south, range 10 and 11 east and town 5 south, range 10 and 11 east, * * *

Anchorage Area.—The limits of the Windsor Harbour Anchorage Area, as noted in the appropriate Canadian Regulations, under the Canada Shipping Act and bearing an Order of Council P.C. number, are marked at the outermost points only on the shoreward edge with cylindrical buoys each painted white and showing a flashing white light. The two buoys are located north of Fighting Island in the Canadian section of the Detroit River about opposite the Canadian Rock Salt Co., Ojibway Mine in Canada. The Windsor harbor master (as pertains to his individual responsibility), a member of the Royal Canadian Mounted Police or a member of the United States Coast Guard may order the master of any vessel to anchor his vessel in the Windsor Harbour Anchorage Area and the master of that vessel shall anchor that vessel in accordance with that order.

There is an 18-foot shoal area about 350 feet south of the southerly buoyed edge of the Amherstburg Harbour section which is on the south end of the combined anchorage area. A buoy marks the northwesterly edge of this 18-foot shoal area.

Charts 14848, 14853, 14854.—River Rouge (Rouge River), Mich.—This river discharges into the Detroit River at the southerly limits of the city of Detroit. Its natural course is generally about 150 feet wide in the lower river, below the junction with the short-cut canal (described below), and about 300 feet wide from the canal to the turning basin near the Ford Motor Co. docks. The mouth of the river is flanked by large industrial plants—Great Lakes Steel Div., National Steel Corp. on

Zug Island to the south, and the Solvay Process Division, Allied Chemical Corp. on the north.

The short-cut canal, an artificial connection, about 3,000 feet long, originally constructed by private interests, extends from the Detroit River about one mile below the mouth of the River Rouge in a straight line to a bend in the River Rouge, thus avoiding an S-shaped curve in the lower river course and shortening the distance to upstream points by 5,600 feet. This short-cut canal in conjunction with the natural Old River Channel, has created Zug Island. This island is occupied entirely by the facilities of several large industrial corporations.

Bridges, etc. Across Improved Channels of River Rouge

No.	Location and name	Kind	Miles above mouth of river	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Short-Cut Canal and River								
1	Aerial cable		.32				191.0		
2	do		.37				191.0		
3	Aerial pipeline	Gas	.39				153.8		Great Lakes Steel.
4	National Steel Corp. (formerly D.T.&I. RR) bridge.*	Railway	.40			125	6.4	2.4	Bascule; clear.
5	Aerial pipeline	Gas	.41			240.0	123.8		Mich. Consol. Gas Co.
6	Aerial cable		.45				174.0		
	Short-Cut Canal-Old Channel.	Junction	.53						
7	West Jefferson Ave. bridge.	Highway	1.10			125	9	5.0	Bascule.
8	ConRail bridge.*	Railway	1.48			123	8	4.0	Do.
9	Fisher Freeway I-75 bridge.	Highway	1.85			230	100.9	96.9	Fixed.
10	Norfolk & Western Ry. (Wabash RR) bridge.	Railway	1.87			125	8	4.0	Bascule.
10A	Aerial pipeline		1.90				103.5		
11	Fort St. bridge	Highway	2.20			125	9	5.0	Bascule.
12	Dix Ave. bridge	do	2.75			125	8.5	4.5	Do.
13	Aerial cable		2.95				130.0		
	Old Channel Via Mouth								
14	Aerial pipeline	Gas	.26				153.0		
15	Delray Connecting RR bridge.	Railway	.30			120	7	3.0	Bascule.
16	do	do	.34			120	7	3.0	Do.
17	Aerial cable		.77				188.0		
18	Detroit, Toledo & Ironton RR bridge.	do	.80	102			7	3.0	Turntable on right side.
19	Aerial cable		.82				188.0		
	Old Channel-Short-Cut Canal	Junction	1.55						

*FM marine radiotelephone—KUZ 371—Channels 16 (156.8 mHz) and 12 (156.6 mHz)

In 1977, the controlling depth was 21 feet at midchannel through Short-Cut Canal to the W. Jefferson Avenue bridge, thence in May 1978, 16 feet at midchannel to the turning basin at the head of the project with 18 feet in the basin except for shoaling along the edges. In May 1978, the controlling depths were 22 feet through the natural mouth of the River Rouge to the overhead pipeline, thence 15 feet at midchannel upstream to the junction with Short-Cut Canal. Due to the soft nature of the bottom, rapid shoaling occurs in the canal and river. There are a number of cables, water mains, and tunnels crossing under the canal and river; masters should exercise caution when dropping anchors.

Aids to Navigation.—The north side of the canal entrance is marked by a buoy at the intersection with deep water in the Detroit River, and is in line with the north side of the canal and about 60 feet outside of the harbor line in the Detroit River.

Signals for Opening Draws, 3 blasts (— — —). Bridge sounds 1 blast as return signal if draw can be opened immediately; if not, bridge sounds 5 short blasts to be followed by 1 long blast when draw is to be opened.

Bridges are Lighted according to U.S. Coast Guard regulations for lighting bridges.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding, and 33 C.F.R. § 117.705 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.140 of Rules and Regulations, preceding.

Charts 14848, 14853.—The Detroit River above Fighting Island is generally wide and clear to Belle Isle. A shoal area with a least depth of 15 feet is about 1⅝ miles above Ambassador Bridge and extends about 450 feet offshore for about ⅜ mile along the river front of Detroit. The upper and lower ends of this shoal are marked with buoys.

The most prominent feature on the Detroit River is the newly constructed Renaissance Center (42°19′44″N., 83° 02′24″W.). The flashing light atop the building is reported to be visible for more than 20 miles.

Submarine Pipelines and Cable.—Two parallel 10-inch submarine pipelines and an electrical cable cross the river between the Canadian Salt Co. Ltd., plant about opposite the mouth of the Old Channel of the River Rouge, to the upstream boundary of the Solvay Process Division, Allied Chemical Corp., plant which is about 1,700 feet upstream from the river mouth.

Aerial Cable.—An aerial power line, comprised of 5 cables, with a minimum clearance of 183 feet, crosses the river from the Detroit Edison Co. Delray Power Plant, about 2,400 feet upstream from the mouth of the Old Channel of River Rouge, to Windsor, Ontario, Canada.

Bridge.—The Ambassador Bridge, completed in 1929, extends from Twenty-first Street in Detroit to Windsor, Ontario. The bridge has a high-level suspension span across the river, with vertical clearance for a length of 100 feet at midstream of 156 feet, decreasing to 133 feet at the United States harbor line and to 133½ feet at the Canadian harbor line.

Intake Crib.—An intake pipeline commences on the shoreline about 1,000 feet east of the south end of the Ambassador Bridge and extends 180 feet 329° to a crib in about 15 feet of water. There is a depth of 12 feet over the crib and it is not marked.

A shoal area exists along the Canadian shoreline in the area extending northeast from the Ambassador bridge to the first railroad tunnel. The outer edge of this shoal generally, is marked with a lighted buoy.

Tunnels.—The ConRail Tunnel under the Detroit River crosses about midway between the Ambassador Bridge and the Detroit-Windsor Tunnel. Soundings taken in 1959 showed depths of 24 feet at a point about 300 feet from the Detroit shoreline and 34 feet at a point about 350 feet from the Windsor shoreline. Depth at midchannel was 31 feet.

The Detroit-Windsor Tunnel for general highway traffic under the Detroit River crosses from the vicinity of Randolph Street just northeast of Woodward Avenue in Detroit to the vicinity of Ouellette Street in Windsor. In 1959 the minimum depths over the structure were 24 feet at a point about 500 feet from the Detroit shoreline and 36 feet at a point about 350 feet from the Windsor shoreline. Depth at midchannel was 40 feet. The U.S. Coast Guard cautions against anchoring over or near these tunnels.

Channels at Belle Isle.—At the westerly or downstream end of Belle Isle, the Detroit River flows around the south side of the island with the main ship channel passing through the Fleming Channel.

The **Fleming Channel** is the natural Detroit River deep water channel; in June 1974, the controlling depth was 27 feet for a least width of 800 feet. The channel extends about 4 miles from the lower end of Belle Isle to the Lake St. Clair Ship Channel. A buoy, at the end of the shoal extending downstream from Belle Isle, marks the lower division of the Fleming and American channels. From the buoy, the channel passes south of Belle Isle to the turn to the northeast around Belle Isle Light and on to the turn above Peach Island Light. Above the Peach Island Light turn, the course is about 2 miles with the William Livingstone Memorial Light on Belle Isle directly astern. In this reach, Windmill Point Light is on the Michigan shoreline and marks the upper easterly end of the Detroit River at the lower westerly end of Lake St. Clair.

Under stress of weather, vessels may find temporary anchorage on the north side of the river from 0.6 mile to 1.9 miles below Belle Isle. (See 33 CFR § 162.135(f), preceding, for restrictions on anchorage in the Detroit River.)

Peach Island, Ontario, with extensive shoal areas off the island west, north and east sides lies to the south of Windmill Point Light.

A buoyed natural channel leads from the Fleming Channel, at the easterly end of Belle Isle, around the south and east sides of Peach Island and on into Lake St. Clair. Deep water is available in this channel for about 2 miles but beyond that distance, the lake is only 8 feet deep.

Aids to Navigation.—Main Channel.—Belle Isle Light is on the southeasterly corner near the head of the island, about 2,900 feet 212¼° from the William Livingstone

Memorial Light. William Livingstone Memorial Light is on the easterly end of Belle Isle. Belle Isle upper buoy is opposite Peach Island Light and marks the division of the channels on each side of Belle Isle. Peach Island Light is on the northwesterly edge of the shoal extending from the west end of Peach Island. The base of this structure is surrounded by protective rip-rap extending horizontally out from the base of the structure about 20 feet. It should not be passed close aboard even by vessels of shallow draft. The southwestern extremity of this shoal is marked by a buoy to indicate the north edge of the channel entrance passing south of Peach Island. Windmill Point Light is located on the north side of the head of the Detroit River.

The American Channel, north of Belle Isle, is crooked and is little used except for local and pleasure traffic.

Bridge.—There is a highway bridge across the American channel, connecting Detroit with **Belle Isle** which is a city park. The bridge is composed of arched concrete spans, without draw, the middle three spans having a vertical clearance of 32.3 feet above Low Water Datum. Vessels requiring a greater height must pass to the south of Belle Isle.

A very shallow middle ground, outlined by buoys, exists between Belle Isle and the main Michigan shore; the channel north of this middle ground has a width of 600 feet with a depth of 18 feet or more. The north side of the entrance to the channel is marked by a buoy about opposite Peach Island Light, and by a buoy at the head of Belle Isle.

Submarine Cable and Pipe Lines.—A pipeline extending across the river between the mainland and Belle Isle lies close to the downstream side of the Belle Isle bridge. A pipeline and a submarine cable cross close to the upstream side of the Belle Isle bridge.

Two pipelines cross from the waterworks on the Michigan mainland to the vicinity of Detroit Yacht Club.

A submarine cable crosses the American channel from just east of the mouth of Conners Creek to the vicinity of the William Livingstone Memorial Light at the head of Belle Isle.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The Detroit waterworks intake crib in the American channel about ⅝ mile westerly from the lagoon light described below, is marked by a light.

Waterworks Intake Lagoon Light, showing a red flash, marks the entrance to the potable water intake lagoon at the northeasterly point of Belle Isle.

Detroit, Mich.—The waterfront of Detroit extends along practically the entire upper 13 miles of the river from the head of Fighting Island to Lake St. Clair, including the American channel at Belle Isle. There are shelving beaches with shallow water inside of the harbor line at and above Belle Isle, but the bank of the undivided river section below the island is well built out to deep water and occupied by numerous industries and docks, the latter having ample accommodations for the varying classes of vessels which use them.

Harbor Facilities.—The Rouge River constitutes a branch channel of the harbor of Detroit, and the related industrial district also extends down the west channel of the lower Detroit River to Ecorse, Wyandotte, and Trenton.

Railroad car-ferry transfers ply between Detroit and Windsor.

A Marine Post Office, designated Detroit River Station, is maintained at Detroit by the U.S. Postal Service, operating a special mail boat which delivers and receives mail to and from boats while passing through the river. Contact is generally on VHF-FM channel 10 (156.50 MHz) or channel 16 (156.80 MHz) with 1 hour advance notice of arrival given from the ship to the contracting agent "Westcott." Vessels are usually met at Ambassador Bridge.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Detroit, Mich., is contained in the **Port Series No. 45** (Revised 1972) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Coast Guard Stations.—Belle Isle Coast Guard Station is located at Belle Isle Light, near the upper end of Belle Isle. Coast Guard Group and Base Detroit are at the foot of Mt. Elliott Street in Detroit, about ½ mile downriver from the Belle Isle Bridge.

Captain of the Port Area.—See **33 C.F.R. § 345-70** of Rules and Regulations, preceding.

Windsor, Ontario.—A city opposite Detroit, and a port of entry with customhouse. It combines the former cities of Windsor and **Walkerville** and the towns of **East Windsor, Sandwich, Riverside** and **Ojibway.**

Windsor Harbour, Ont.—Speed Regulations.—Effective 1974, no vessel having an overall length of 65 feet or more shall navigate in the harbour at a speed exceeding 10 statute miles per hour. No vessel having an overall length of less than 65 feet shall navigate between Belle Isle West End Lighted Buoy (U.S.) at the lower end of Belle Isle and Peach Island West Light Buoy No. 4 at the lower end of Peach Island at a speed exceeding 10 statute miles per hour.

No vessel shall navigate between Peach Island West Light Buoy No. 4 at the lower end of Peach Island and Peach Island Light Buoy at the upper end of Peach Island at a speed exceeding 6 statute miles per hour. No vessel shall, between Belle Isle West End Lighted Buoy (U.S.) at the lower end of Belle Isle and Peach Island West Light Buoy No. 4 at the lower end of Peach Island, overtake another vessel having an over-all length of 65 feet or more.

Harbor Facilities.—Harbor facilities include about 17 miles of riverfront along which are numerous docks and railway transfer slips with from 18 to 27 feet of water. Communication with Detroit is afforded by railway car ferries, railroad tunnel, highway tunnel, and bridge, as

described under the heading above. Copies of the Bylaws for the control of the harbor at Windsor, may be obtained on application to the Secretary, Windsor Harbour Commission, 500 Riverside Drive West, Windsor, Ontario N9 A5K6.

Canadian Customs.—See Canadian Customs Regulations under chapter 1, preceding. Commercial and pleasure craft are inspected at their berths after calling a Customs Officer; telephone, 519-254-9202.

Directly across the Detroit River from Fort Wayne, the Windsor Harbour Commission completed a new berth in 1972. This facility is primarily for liquid fuel tankers but also available for bulk unloaders. Vessels up to 560 feet could dock in 27 feet of water in 1977.

Opposite the River Rouge Short-Cut Canal, the Morton Terminal Ltd. has dockage on the river and a slip 2,400 feet long, 400 feet wide on the harbor line and 200 feet wide between the dock fenders.

The Ojibway Mine of the Canadian Rock Salt Co., Ltd., is located a mile downstream from the Morton Terminal slip. A fill extends about 600 feet from shore near the mine to center of a 400-foot long salt loading dock which parallels the channel.

A boulder shoal with a least charted depth of 17 feet is 1,400 feet northeast of the Ambassador bridge. The shoal extends about 400 feet northwest of the Canadian shore and is marked by a lighted buoy.

Hiram Walker & Sons, Ltd. distillery and grain elevators, opposite the foot of Belle Isle, are conspicuous landmarks. The distillery wharf is 833 feet long with a reported depth alongside in July 1977 of 25 feet. To obviate damage to elevator unloading equipment by wash from passing ships, the navigating speed should be reduced at this point whenever a vessel is unloading at the wharf.

The Canadian plant of the Ford Motor Co. of Canada, Ltd. in the same locality, has good docks.

Water Intake.—A submerged water intake 20 feet square, having piles at each corner with 19.2 feet of water over them, is located about 125 feet from shore abreast of the Walker dock.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is at the Anchor Inn near Little River opposite Peach Island.

The navigable waterways immediately above the Windmill Point-Peach Island area are described under the Lake St. Clair heading.

8. LAKE ST. CLAIR

Depths and vertical clearances under aerial crossings and bridges herein given are referred to Low Water Datum, which for Lake St. Clair is an elevation of 571.7 feet above mean water level at Pointe-au-Pere (Father Point), Quebec, on International Great Lakes Datum (1955).

DIMENSIONS, ETC.

Length, steamer track, outlet of South Channel of St. Clair River to Windmill Point Lighthouse ..... miles	18½
Length (right line), on about longitude 82°45' miles	26
Breadth (right line), on about latitude 42°25' miles	24

Areas in square miles:	*United States*	*Canada*	*Total*
Water surface of lake*	198	292	490
Entire drainage basin*	3,050	4,370	7,420

*Including St. Clair River and Detroit River.

GENERAL DESCRIPTION

Physical Description.—Lake St. Clair is an expansive shallow basin, having low and marshy shores and flatly sloping bottom formation, and with maximum natural depth of about 21 feet. It is located at about the midpoint of the Great Lakes system of waterways. The St. Clair River flows into the lake from the north with the several channels through the river delta section entering the north central and north-westerly areas of Lake St. Clair. The outflow from the lake is through the Detroit River head in the south-west section of the lake. The lake has its chief importance in the ship-channel improvements which constitute a connecting link in the through waterway from Lake Erie to Lake Huron. There are no large commercial or industrial communities and no harbors of other than small consequence located around its shores.

Anchoring of Vessels.—Cautionary Notice.—When coming to anchor vessels masters are cautioned not to foul submarine cables. Fouling cables may not only result in disrupting utility services to adjacent communities but also expose the mariner to the danger of high voltages carried by certain cables. Mariners are advised to slip the anchor rather than cut the cable if the normal practice of good seamanship fails to clear the fouled anchor. Lost gear or damaged cables should be reported to the authority having jursdiction over the waterway.

Charts.—The National Ocean Survey publishes three charts, No.'s 14850, 14851, and 14853. Chart 14850 shows the navigational conditions of the waterway, the locations of all authorized aids to navigation, and details of shore topography for use over the entire lake. Chart 14853 covers only the U.S. shoreline and immediately adjacent Canadian shores in the Detroit River, Lake St. Clair and St. Clair River.

Fluctuations of Water Level.—The normal elevation of the lake surface varies from year to year. During each year the water level is subject to a consistent seasonal rise and fall usually reaching the highest stages in the summer months and the lowest stages in the winter months.

In addition to the seasonal variations in level, occasional transient fluctuations occur; caused ordinarily by sudden changes in barometric pressure or wind action. The amplitude of these fluctuations may amount to a foot or more and the period may reach several hours. At times, when the level is affected by winds of sufficient velocity to drive the surface water forward in greater volume than it can be carried back by the lower return currents, the water elevation is raised on the lee shore and lowered on the weather shore. This action is materially increased in the bays where the impelled water is concentrated in a restricted space, especially if the converging shores of the bay feature a gradually sloping inshore bottom. The latter condition is very pronounced at Anchor Bay.

Navigation Regulations.—See 33 CFR § 162.135 of Rules and Regulations, preceding.

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Pilotage Regulations.—See 46 U.S.C. 216–216i published in Certain Laws, preceding, and 46 C.F.R. § 401 (in part) of Rules and Regulations, preceding.

Pilot Dispatch Offices.—The Welland Canal, Lake Erie and Southeast Shoal to Port Huron, in Great Lakes Pilotage District No. 2 are serviced by the following dispatch offices:

International District No. 2
Port Weller Pilot Office
P.O. Box 2008, Station B
St. Catharines, Ontario, Canada
416–934–2921
Lakes Pilots Association
802 Sedgwick Street
Port Huron, Michigan 48060
313–982–1762

Charts 14850, 14853.—Lake St. Clair Ship Channel, Mich.—This improvement consists of a channel about 17 miles long across the deeper portion of Lake St. Clair between the lower end in the Detroit River and Peach Island area, and the upper end at St. Clair Cutoff Channel Pier Light 2. This light is at the junction of the former outlet of the South Channel Southeast Bend and the new St. Clair Cutoff Channel. The Cutoff Channel extends on a straight line from the ship channel to the St. Clair River South Channel. The St. Clair Flats Canal around the Southeast Bend is no longer maintained.

In 1976–1977, the midchannel controlling depth was 26 feet in the Lake St. Clair ship channel.

Aids to Navigation.—The main vessel course from above Windmill Point to the Lake St. Clair Light at about midlake, is on the Peach Island Range of 227¾° at the lower end of the lake. A tall apartment building on the north shore at Windsor is prominent, and is on the alignment of the range. The base of the front light structure of the Peach Island Range is surrounded by protective rip-rap extending horizontally out from the base of the structure about 23 feet. It should not be passed close aboard even by vessels of shallow draft. Above the angle at St. Clair Light, the course follows into the St. Clair Flats Range of 041° at the upper end of the old Southeast Bend Channel. The channel is well marked with buoys throughout the entire length.

Lake St. Clair Dumping Ground.—Abreast of the lower end of Lake St. Clair ship channel, and distant 900 feet southeasterly therefrom, a dumping grounds area runs in a northeast direction 2½ miles, with width of 1¼ miles and an irregular shoal bottom. The area is outlined with buoys.

Dumping Grounds Regulations.—See 33 U.S.C. 419, published in Certain Laws, preceding, and 33 C.F.R. § 205, of Rules and Regulations, preceding.

NOTE.—Although new dumping in this area is prohibited above 8 feet below Low Water Datum, shoals considerably above that depth exist. This dumping ground is not considered safe for navigation.

The west, or Michigan shore of Lake St. Clair, has developed extensively with private homes, yacht clubs, marinas, etc.

The communities of Grosse Pointe Park, Grosse Pointe City, Grosse Pointe Farms, Grosse Pointe Shores, and St. Clair Shores, suburban to Detroit, are situated on the westerly lake shore extending from Windmill Point at the head of Detroit River to about 10 miles northerly. A number of piers with 6 to 10 feet of water extend into the lake up to about 2,500 feet, some being marked by privately maintained lights.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The Grosse Pointe Farms-Highland Park submerged water intake crib with 5½ feet of water over it, is located 1,700 feet 069° from the Crescent Sail Yacht Club Light. A buoy is moored about 50 feet southerly of the crib.

St. Clair Shores, Mich.—The city of St. Clair Shores shoreline area extends about 6½ miles from the Milk River northerly. About one mile of shoreline from the Milk River north has been developed extensively with marinas and facilities for the recreational boater, interspersed with a number of private boat channels. The remainder of the shoreline is primarily an unbroken line of private properties with only a few municipal parks, ramps, etc. Facilities within the developed boating area include all types of services for the recreational craftsman.

Milk River.—The Milk River is a small river draining under the Jefferson Avenue bridge in St. Clair Shores and continuing on about 2,000 feet into Lake St. Clair at Gaukler Point. A series of taintor gates has been installed on the lakeward side of the highway bridge to allow some control of the river water level upstream of the gates. The section of the river downstream from the gates has been developed for small boat dockage.

Outfall Pipeline.—The Milk River Drain, an outfall pipeline, has been established in Lake St. Clair on the south side of the entrance to the Milk River. The pipeline extends about 1,000 feet northeasterly from the shore to a submerged concrete cap over the outfall. A lighted buoy is located about 350 feet west of the concrete structure.

Beacon Light.—The Wm. C. Miller Memorial Beacon Light is located 3,200 feet 347° from the control gate on the Milk River at Jefferson Avenue. The rotating light is mounted 266 feet above the water and shows alternate red and white, visible 25 miles.

Coast Guard Station.—A station is located in St. Clair Shores, Michigan, at the end of Revere Avenue about 3,500 feet north of Miller Memorial Light.

Shoal Area.—A buoyed boulder shoal area lies about one mile off shore between the Nine and Ten Mile Roads in St. Clair Shores. The shoal has only 2 feet of water in several areas with more than 6 feet to the west, north and east of the buoyed shoals. There is generally less than 6 feet of water to the south of the shoal.

About 2 miles north of Gaukler Point an exposed concrete sewer outlet known as Martin Drain, extends about 1,000 feet into the lake. The outlet is marked by a private light shown 12 feet above the water.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceeding. Regulation No. 50 Macomb county. R 281.750.6. Lake St. Clair and channels; slow—no wake speed.

Structures Across the Clinton River Spillway Channel

No.	Location and name	Kind	Miles above mouth of channel	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Jefferson Ave	Highway	0.12						
2	Aerial Cable		.12						
3	Edsel Ford Freeway bridge, I-94, south span.	Highway	.84						
3A	Edsel Ford Freeway bridge, I-94, north span.	do	.84						
4	Metropolitan Parkway	do	1.04						
5	Harper Ave	do	1.66						
6	Weir		2.03						
	Clinton River	Junction	2.13						

6. On those waters of lake St. Clair and natural and artificial canals connecting thereto, city of St. Clair Shores, county of Macomb, state of Michigan, west of a line from a point beginning at the city line between St. Clair Shores and Grosse Pointe Shores at the water's edge, thence 070°T 1,300 feet, thence 340°T 6,500 feet, thence 000°T 7,500 feet more or less to a point due east of the foot of 11 Mile road, thence 270°T 1,300 feet more or less to the shoreline of lake St. Clair at the foot of said 11 Mile road being latitude 42°29.8′ N, * * *

Clinton River Spillway Channel.—About 7½ miles northeast of Gaukler Point, the outlet of the Clinton River Spillway Channel, also known as the Cutoff Canal, flows into Lake St. Clair. The canal extends about 2 miles in a northwest direction from the lake to a weir just below the canal junction with the Clinton River on the south side of the city of Mount Clemens. The canal has a depth of 9 feet just inside the mouth, gradually shoaling to 6 feet just below the weir. Immediately above and below the weir, depths of only 1 and 2 feet, respectively, were available in 1962. The purpose of the canal is to divert a major portion of the Clinton River flows under flood conditions.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A water intake pipeline of the Mount Clemens Waterworks commences at a point on the shoreline about 3,000 feet northeast of the Clinton River Spillway Channel mouth and extends 4,550 feet 132° to a crib in 9 feet of water. There is a depth of 8 feet of water over the crib. The crib is not marked.

Above the Cutoff Canal, a land mass projects from the Michigan shoreline into Lake St. Clair. The most southeasterly projection is Point Huron.

Black Creek flows into Lake St. Clair along the northerly side of the Point. This creek forms the main entrance, which is buoyed at the mouth, into an extensive dredged channels area between Point Huron and the Clinton River. The entrance is marked by a 297¼° private lighted range and private lighted buoys. In August 1977, the reported controlling depth was 5 feet through the entrance.

The Huron-Clinton Metropolitan Auth. has developed one transient docking facility alone and another in conjunction with the Waterways Commission at Metropolitan Beach on this waterway. Water, sewage pump-out facilities, and electricity are available at these facilities with access to the park also available.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceeding. Regulation No. 50, Macomb county. R 281.750.10. Black creek and channels and canals in Harrison township; speed restriction.

10. On the waters of Black creek and the natural and artificial channels and canals in Harrison township, Macomb county, state of Michigan, * * *

Anchor Bay, Mich.—This bay is a shallow northwest arm of Lake St. Clair, receiving the outflow of the North Channel of the St. Clair River. It has maximum depths of about 11 feet in its central portion, shelving gradually to the shore line, and is separated from the main lake by a bank across which only 8 or 9 feet can be carried. The best water across this bank is on a north and south line passing close to eastward of Point Huron buoy moored in 10 feet of water 2½ miles southeasterly from Point Huron.

Clinton River, Mich.—This is a narrow and crooked stream discharging into the west side of Anchor Bay about 2 miles north of Point Huron. The city of Mount Clemens is about 7.3 miles above the mouth.

Channels.—A dredged channel leads from Anchor Bay between two breakwaters through the mouth of the river and upstream to Mount Clemens. The south breakwater encloses a harbor basin on the south side of the channel at the mouth of the river. In 1976, the controlling depths

were 5 feet through the mouth of the river to the Inner Light and in the basin, and thence 3 feet to the head of the project.

The controlling depth in the river above Mount Clemens is 2 feet and the river is navigable only by small boats, launches, and flatboats for a considerable distance upstream from Mount Clemens.

Fluctuations of Water Level.—Each year the level of the Clinton River rises and falls from 6 to 9 feet at Mount Clemens, due to the fact that the spring freshets raise the level considerably above the normal. From day to day the level changes somewhat, due to wind, such changes occasionally amounting to over a foot.

Aids to Navigation.—The entrance into the Clinton River from Anchor Bay is well marked with aids including a buoy located about 1¼ miles east of the entrance. This buoy marks the turn from the Anchor Bay courses into the buoyed channel leading to the entrance. The various buoys marking this channel may be relocated as necessary without prior notice. The new Clinton River

Structures Across Clinton River to Mount Clemens

No.	Location and name	Kind	Miles above Clinton River Inner Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
0	Submerged cables (abandoned).	Power	.75						Detroit Edison. Approx. depth 14 feet. (3 cables).
1	Submerged pipeline	Water	1.0						Harr. Twn. Approx. depth 15.2 feet.
2	Submerged cable	Telephone	1.0						Mich. Bell Tel. Approx. depth 9 feet.
2A	Submerged pipeline	Water	1.50						Harr. Twn.
3	Submerged pipeline	do	1.6						Harr. Twn.
4	Submerged cable	Telephone	1.8						Mich. Bell Tel.
5	do	Electric	1.8						Detroit Edison.
6	Submerged pipeline	Water	2.9						Harr. Twn.
7	Bridgeview Ave. bridge	Highway	3.5			50.0	24.3		State—fixed.
7A	Submerged pipeline	Water	5.80						Harr. Twn.
8	Submerged pipeline	Water	5.85						Harr. Twn.
9	Edsel Ford Freeway bridge, I-94, south span.	Highway	5.95			56.0	28.0	24.0	State—fixed.
9A	Edsel Ford Freeway bridge, I-94, north span.	do	5.95			55.0	28.0	24.0	Fixed.
9B	Aerial cable	Power	6.58				46		Detroit Edison.
10	Submerged pipeline	Sewer	6.86						Mount Clemens.
11	do	Water	7.16						Do.
12	Market St. (Dickinson) bridge.	Highway	7.2			78.0	14.6	10.6	Mount Clemens-fixed.
13	Submerged pipeline (abandoned 1971).	Water	7.26						Mount Clemens. Approx. depth 10 feet (6″pipe).
14	Submerged pipeline	Gas	7.31						Consumers Power.
15	Cass Ave. (Crocker) bridge.	Highway	7.32			64.2	20.8	16.8	Mount Clemens-fixed.
16	Aerial cable	Electric	7.45				58		Detroit Edison.
17	Submerged pipeline	Sewer	7.55						Mount Clemens.
18	do	Water	7.57						Do.
	Cutoff Canal	Junction	9.00						
19	Broadway St. bridge	Highway	9.24			74.5	15.1	11.1	State—fixed.

breakwaters, completed in 1965, are marked with lights at the lakeward end on the channel side. Clinton River North Breakwater Light is mounted 25 feet above the water on a red steel column. The South Breakwater Light is mounted 25 feet above the water on a black steel column.

Due to very shallow water, small boat operators are cautioned against passing between buoys 12 and 14 and the north breakwater.

Obstruction.—An obstruction with a least depth of 4 feet lies 3,900 feet 111° from the Clinton River Inner Light, or about 700 feet south of the entrance buoys. The entrance should be approached from the east.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 50, Macomb county.

R 281.750.9. Clinton river; speed restriction.

9. On the waters of Lake St. Clair and the Clinton river, Harrison township, Macomb county, state of Michigan, westward from the easterly ends of the Clinton river breakwater, * * *

Selfridge Air National Guard Base.—This base is located between Mount Clemens on the west, the Clinton River to the south, and Anchor Bay on the east. About 2⅛ miles northwest of the Clinton River Inner Light, a breakwater sheltering the harbor and crash rescue dock at Selfridge Air National Guard Base is marked by three lights with one light on the center of the breakwater and the other lights on each end.

A range of lights, on alignment 261° is located on shore at Selfridge Air National Guard Base to mark the entrance to a small boat basin at the remnant of the former Tucker Creek, and shown only when crash boats are out on patrol. The lights are shown from poles carrying orange and black triangular daymarks.

About 1 mile to the north, Selfridge Launch Facility Entrance Light 2, privately maintained annually from May 1 through November 1, is shown from a steel pile 29 feet above the water.

Coast Guard.—U.S. Coast Guard Air Station, Detroit is at Selfridge Air National Guard Base. The air station supports Coast Guard surface operations, carries out search and rescue missions, and renders airborne assistance. The air station can be contacted through the nearest Coast Guard station.

To the north and northeast of Selfridge, the shore is indented with many small creeks and dredged channels developed for housing with adjacent small boat facilities.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding.

R 281.750.8. South channel; moorage restriction.

8. On the waters of South channel, between lots 233 and 234, Anchor Bay Shores subdivision, private claims 146 and 147, town 3 north, range 14 east, township of Chesterfield, county of Macomb, state of Michigan, no vessel shall be moored, docked or anchored or shall in any other manner obstruct or restrict the passage of other vessels, for a distance of 350 feet inland from lake St. Clair.

Salt River.—The mouth of this river, about 4 miles northerly from the Clinton River Inner Light, has been developed as a small-boat harbor by private interests. The entrance channel is marked by private lights and a lighted range. Soundings taken in May 1968 show a controlling depth of 4 feet along the line of range to the mouth of the Salt River, 5 feet to within 500 feet of the Jefferson Avenue highway bridge and 3 feet up to the bridge.

Obstructions.—The submerged concrete bases of former light structures exist in unknown positions in the entrance to Salt River.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceeding. Regulation No. 50, Macomb county.

R 281.750.7. Salt river, Vase creek, and certain channels and canals in Chesterfield township; slow—no wake speed.

7. On the waters of the Salt river, Vase creek and all channels and canals on private claims 146, 147, 192, 193 and 342, sections 22, 23, 26, 27, 28 and 29, town 3 north, range 14 east, township of Chesterfield, county of Macomb, state of Michigan, * * *

New Baltimore, Mich.—This village is on the northerly shore of Anchor Bay. The docks on the bay front, including the City Dock, have about 4 feet of water.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. From a point on the shoreline 400 feet south of the tank in New Baltimore, two intake pipelines of the town of New Baltimore, Mich. extend into Anchor Bay. The northerly intake pipeline extends 300 feet 124° to a dogleg extending 600 feet 101° to a crib in about 4 feet of water. The southerly intake pipeline extends 1,500 feet 139° to a crib in about 5 feet of water. There is a depth of four feet over the crib. These cribs are not marked.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceeding. Regulation No. 50, Macomb county and No. 74, St. Clair county.

R 281.750.4. and R 281.774.1. Lake St. Clair; portion of, channels, canals.

4. On the waters of Crepeau (also known as Frog) creek, Marsac creek, and all natural and artificial channels and canals in the city of New Baltimore, county of Macomb, state of Michigan, * * *

R 281.750.5 and R 281.774.2. Lake St. Clair; portion of, channel.

5. On the waters of that portion of lake St. Clair, city of New Baltimore, county of Macomb, state of Michigan, in a channel which extends 500 feet southerly from a harbor entrance at 42°40′21″ north latitude and 82°44′17″ west longitude, * * *

Fair Haven, Mich.—This village is located on the northeast shore of Anchor Bay about 4 miles east of New Baltimore. An area of dredged canals extends along Anchor Bay with Swan Creek having its outlet in this area.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A water intake pipeline of Ira Township extends from a point on shore 600 feet 163°

from the tank in Fair Haven. The crib at the end of the pipeline is 1,200 feet 200° from the shore in about 8 feet of water and has a depth of 4 feet over it. There are no markers on the crib.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceeding. Regulation No. 74, St Clair county. R 281.774.6. Swan creek and all connecting channels; speed restriction.

6. On the waters of Swan creek and all connecting channels, commencing at its mouth at Anchor bay, lake St. Clair, to Short Cut road, a distance of 2,770 yards more or less, township of Ira, county of St. Clair, state of Michigan, * * *

From Fair Haven, the east side of Anchor Bay extends through a very shallow water area including the North Channel of the St. Clair River outflow and the Middle Channel. A wildlife conservation area is located on the easterly side of the bay through this region.

The northeast section of Lake St. Clair from the Middle Channel, through the South Channel, St. Clair Cutoff, and on to the lower outlet of the Chenal Ecarte, is described under the St. Clair River heading.

Mitchell Bay, Ontario.—Located in the northeasterly corner of Lake St. Clair, there is a 325-foot wharf at Mitchell Bay village, with a dredged channel 50 feet wide and a depth of 2 feet leading to the wharf. A range of lights bearing 045° leads to the wharf.

From the above channel, another dredged channel leads on an azimuth of 286° to an angle, thence on an azimuth of 344° to Chenal Ecarte. The first portion of the channel is marked by a tri-coloured range light located on shore south of the village. The light is shown from a white square skeleton tower and is visible as follows: red from the south to 105°; white, the preferred channel, from 105° to 107°; green from 107° to north. The angle is marked by a black lighted buoy located 5,500 feet 287° from the Shore Range front light. Except for a buoy, the remainder of the channel to Chenal Ecarte is unmarked and should be used only by those locally familiar with its location. In 1973 the controlling depth was 1½ feet.

Small-craft facilities.—Two marinas are located in Patricks Cove, situated close east of Mitchell Point. Another marina is north of the Government wharf at Mitchell Bay; the entrance to this marina is about 1,000 feet north of the wharf. A fourth marina is ¼ mile up Rankin Creek. All marinas have gasoline, freshwater, and the usual small-craft facilities.

Artificial Island.—The Canadian Public Works Dept. completed in September 1973, the construction of a permanent steel box-type structure 300 feet wide by 400 feet long in Mitchell Bay, offshore about 1 mile. The structure, in 3 feet of water with approximately 7 feet above water, is located approximately 6,000 feet 230° from Mitchell Bay Front Range Light. The facility is used for research work on disposal of contaminated dredge material.

There is a dredged channel in Mitchell Bay leading to Chenal Ecarte, marked by a sector light showing red, white (preferred channel) and green, located on the east end of Martin Island, which lies south of Ste. Anne Island. Buoys mark the sides of the dredged cut. In 1973, the controlling depth in the channel was 2½ feet. Dredged channels are subject to considerable filling and require dredging for maintenance.

Speed Limits.—To reduce the deterioration of dykes and low farm land caused by wash, a speed limit of 5 nautical miles per hour has been established in the following areas:

1. On the Chenal Ecarte from the St. Clair River to Mitchell Bay, Ont.
2. On the Sydenham River from the Chenal Ecarte to Dresden, Ont. (above Wallaceburg).
3. On the Thames River from Lake St. Clair to Chatham, Ont.

Thames River, Ontario.—This river empties into the southeasterly end of Lake St. Clair, and is reached through a channel approximately 7,900 feet long and 100 feet wide, dredged across the shallows in the lake. Owing to its exposed position and its bed of fine sand, the channel is subject to considerable filling, and requires dredging for maintenance. In 1973, the channel had a least reported depth of 3 feet. The buoys marking the channel are periodically relocated to mark the best water. These relocations may be without any announcement.

There is a wharf on the south side of the river mouth. The Thames River front range light is 22 feet above the water on a white tower. The rear range light is 55 feet above the water on a white tower located 285 feet 147° from the front range light. A lighted buoy is in Lake St. Clair about 2 miles 328° from the Thames River front range light. The buoy should be kept on the left hand in making the entrance.

A small-boat harbor is located just east of the directional light on the south side of the Thames River. Facilities available include fuel, water, food, 10-foot depth of water, launching ramp and a Canadian Customs clearing point of entry.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is at the Lighthouse, at the mouth of the Thames River.

Chatham, Ontario.—The city of Chatham is situated about 18½ miles upstream from the river mouth, and a channel about 7 feet deep has been provided by dredging through bars and widening the channel at bends in the river and removing snags and sunken obstructions. The river is navigable for 5 feet draft to Louisville, about 7 miles above Chatham.

Water Intake.—A water intake pipeline commences on the shoreline 4,700 feet 335° from the spire in Stony Point, Ont., and extends 4,300 feet 004° to an intake crib in about 7 feet of water. There is a depth of 3 feet of water over the crib. The north side of the crib is marked with a private buoy.

The Ruscom River flows into the south side of Lake St. Clair about 8¾ miles east of Windsor. A spoil bank about 2,600 feet long is on the east side of the entrance channel to the river. Dredging to 5 foot grade was carried out in 1972. A number of buoys have been established to mark the best approach channel to the Ruscom River and may be

relocated when shoaling occurs. In April 1978, severe shoaling was reported in the river channel.

Belle River, Ontario.—This village, about 13 miles west of the Thames River, is on the south shore of Lake St. Clair, about 17 miles east of Windsor. The Canadian National Railway has a station here. The east bank of the river for about 568 feet at the mouth is lined with a steel sheet-pile revetment wall, forming a dock at which small craft can moor. This wall projects into the lake an additional 1,387 feet, protecting a dredged channel 60 feet wide on the west side of the wall. A steel sheet-pile revetment wall 630 feet long, has been built parallel to the west bank of the river and extends 520 feet into the lake. A light is shown on the outer end of the east breakwater. In 1973, the entrance channel had a least depth of 6½ feet and a width of 60 feet. A basin 110 by 80 feet has been dredged to about the same depth on the west side of the river about 150 feet north of the Canadian National Railway bridge. A pipeline, extending north to a crib in more than 6 feet of water, is located about 1,000 feet east of the east entrance wall.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is at Belle River.

Riviere aux Puces, Ontario.—This river is on the south shore of Lake St. Clair, about 13½ miles east of Windsor. Parallel steel sheet pile training walls 78 feet apart on the east and west side at the mouth and extending 200 feet into the lake afford some shelter for small craft. The entrance channel has a width of 40 feet and a reported depth of 4½ feet.

Aids to Navigation.—Riviere aux Puces East Light is located on the outer end of the east steel sheet pile wall. Riviere aux Puces Light is located on the outer end of the west steel sheet pile wall.

Pike Creek, Ontario.—This waterway is on the south shore of Lake St. Clair about 10 miles east of Windsor. The entrance channel has two steel sheet pile training walls, the west wall being 100 feet long and the east wall 200 feet long. It has a width of 40 feet and a reported depth of 5 feet.

Aids to Navigation.—Pike Creek Entrance Light, mounted 17 feet above water on a white mast, is located on the east side of the entrance to Pike Creek. Pike Creek Light is located on the outer end of the steel sheet piling west wall. A number of buoys have been established to mark the best channel into Pike Creek and may be relocated when shoaling occurs.

9. ST. CLAIR RIVER

Depths and vertical clearances under aerial crossings and bridges herein given are referred to the sloping surface of the river corresponding to a Lake Huron stage of 576.8 feet and a Lake St. Clair stage of 571.7 feet above mean water level at Pointe-au-Pere (Father Point), Quebec, on International Great Lakes Datum (1955), which elevations are the planes of Low Water Datum for the two lakes.

GENERAL DESCRIPTION

Physical Description.—The St. Clair River has two characteristic sections—the lower or delta portion, and the upper or normal channel.

The delta portion, commonly known as the St. Clair Flats, is the land and water area at the lower end of the St. Clair River below Chenal Ecarte, Ontario, and formed by the division of the river into a number of distributaries. The most important branch, used for through navigation, is called the South Channel, and it connects Lake St. Clair with the main river through the St. Clair Cutoff Channel.

The distance from the southwest end of the St. Clair Cutoff Channel to the head of Chenal Ecarte via the South Channel is about 11 miles, making the total length of the vessel course from Lake St. Clair to Lake Huron about 39 miles.

The upper channel runs from the head of the Chenal

Structures Across the St. Clair River

No.	Location and name	Kind	Miles above St. Clair Flats Canal Light 2	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Submerged cable	Telephone	5.50						
	Chenal Ecarte	Junction	13.00						
	Belle River	do	17.72						
2	Aerial cable	Electric	22.58				154.0	150.0	Detroit Edison Co.
3	Submerged pipeline	Gas	23.90						24″ dia. Burial 10 feet 1967. Gt. Lks. Gas Transm. Co.
4	do	do	24.00						Do.
4A	Aerial cable	Electric	24.10				163.0		Detroit Edison Co.
	Pine River	Junction	25.83						
5	Submerged pipeline	Water	26.60						City of St. Clair. Approx. depth 27 feet.
5A	Submerged pipeline	Petroleum (crude).	32.30						L'k'd Pipeline Co. 30″ dia. Burial 15 feet 1969.
6	Submerged pipelines (three).	Petroleum	32.57						
7	Aerial cable	Electric	33.25				177.7	173.7	Detroit Edison Co.
8	Tunnel-G.T.W. RR	Railroad	36.28						
	Black River	Junction	37.23						
9	Blue Water Bridge	Highway	39.10			600.0	135.0		Fixed.*

*Four fixed red lights mark the channel limits and two flashing green lights are located at the center of the span, on the axis of the Fort Gratiot range; the lights are suspended from the lower chords of the bridge.

Ecarte to Lake Huron, a distance by steamer track of about 28 miles. There are two islands in the upper portion of the river—Fawn (Woodtick) Island and Stag Island.

Anchoring of Vessels.—Cautionary Notice.—When coming to anchor vessels masters are cautioned not to foul submarine cables. Fouling cables may not only result in disrupting utility services to adjacent communities but also expose the mariner to the danger of high voltages carried by certain cables. Mariners are advised to slip the anchor rather than cut the cable if the normal practice of good seamanship fails to clear the fouled anchor. Lost gear or damaged cables should be reported to the authority having jurisdiction over the waterway.

Channels.—Channels have been dredged in various sections of the St. Clair River as described under separate headings following. The Federal project depth in the river is 27 feet.

Charts.—The National Ocean Survey publishes two charts, No.'s 14852 and 14853 detailing the entire length of the river. In addition, Chart 14850 of Lake Clair covers the delta portion of the river.

Current Velocities.—The following current velocities are based on averages of water flow through the entire cross section of the river, that is from bank to bank and from the surface to the bottom during normal flow conditions. Normal water flow conditions are encountered when there is no wind, Lake Huron is at a stage of 577.5 feet and Lake St. Clair is at a stage of 573.2 feet above mean water level at Pointe-Aux-Pere (Father Point), Quebec on the International Great Lakes Datum (1955), that is, +0.7 feet and +1.5 feet above their respective low water datums. The current encountered at midstream is usually about 1.5 times the average velocity. Greater velocities may be expected when the difference between the lake levels are greater, or the lake stages are higher. The following are approximate average velocities through the indicated reaches: between Southeast Bend and Sans Souci, 1.3 m.p.h.; at Port Lambton, Ontario, 1.8 m.p.h.; at Marine City, Michigan, 1.6 m.p.h.; at Hart's Landing Light, 2.1 m.p.h.; at the head of Stag Island, 1.7 m.p.h.; at the Blue Water Bridge, 3.8 m.p.h. The rapids section extends from about 1,000 feet above to 200 or 300 feet below the Blue Water Bridge. During periods of sustained high north to northeast winds on Lake Huron, velocities in the upper St. Clair River are increased. The banks of the river are clay and sand and usually quite steep.

Fluctuations of Water Levels.—Each year the St. Clair River rises and falls about one foot, mainly in consonance with the seasonal level variations of Lake Huron, as measured by monthly average levels. Since 1900 the difference between the highest and lowest monthly average level has been about 5½ feet. Occasional rapid fluctuations of 2 feet up or down have occurred because of higher wind. Mariners are cautioned that such fluctuations in level may result in available depths being less than charted depths.

Navigation Regulations.—See 33 C.F.R. § 162.135 of Rules and Regulations, preceding.

Pilotage Regulations.—See 46 U.S.C. 216–216i published in Certain Laws, preceding, and 46 C.F.R. § 401 (in part) of Rules and Regulations, preceding.

Pilot Dispatch Offices.—The Welland Canal, Lake Erie and Southeast Shoal to Port Huron, in Great Lakes Pilotage District No. 2, are serviced by the following dispatch offices:

International District No. 2
Port Weller Pilot Office
P.O. Box 2008, Station B
St. Catharines, Ontario, Canada
416–934–2921

Lakes Pilots Association
802 Sedgwick Street
Port Huron, Michigan 48060
313–982–1762

Slow—No Wake Speed.—See Regulations—State of Michigan, preceeding. Regulation No. 74, St. Clair county. R 281.774.15. St. Clair river and connected waters; slow—no wake speed.

15. On the waters of the St. Clair river, from its confluence with the Black river, downstream to lake St. Clair, including its north channel, middle channel, the Chenal A Bout Rond (the Sni Bora), the south channel, Baltimore highway, Big Fisher highway and Sears highway, it is unlawful for:

(a) The operator of a vessel less than 26 feet in length to exceed a slow—no wake speed when within 200 feet of any shore, dock or pierhead and within the jurisdictional boundaries of the State of Michigan.

(b) The operator of a vessel 26 feet or more in length to exceed a slow—no wake speed when within 600 feet of any shore, dock or pierhead, and within the jurisdictional boundaries of the State of Michigan.

LOCAL DESCRIPTIONS FROM THE MOUTH OF THE RIVER TO THE HEAD OF THE RIVER

Charts 14850, 14852, 14853.—The lower, or delta, section of the St. Clair River is in the northeast part of Lake St. Clair and has many channels providing an outlet for the flow of the water into Lake St. Clair. Included in these river outflow channels is the Chenal Ecarte at the most easterly part of the delta. The Sydenham River connects with the Chenal Ecarte and together they form a waterway from the St. Clair River into the community of Wallaceburg, Ontario. There are several submerged cables across the Chenal Ecarte in the vicinity of the new bridge from Highway 40 to Walpole Island, Ontario.

Speed Limits.—To reduce the deterioration of dykes

and low farm land caused by wash, a speed limit of 5 nautical miles per hour has been established in the following areas:

1. On the Chenal Ecarte from the St. Clair River to Mitchell Bay, Ont.

2. On the Sydenham River from the Chenal Ecarte to Dresden, Ont. (above Wallaceburg).

3. On the Thames River from Lake St. Clair to Chatham, Ont.

Bridge.—A swing bridge across the Chenal Ecarte from the Canadian Mainland to Walpole Island was opened in 1970. The bridge is about 3¾ miles downstream from the junction of the Chenal Ecarte and the St. Clair River and will be manned from 15 March to 15 December during the following hours: Monday thru Thursday—0700 to 2300; Friday thru Sunday—0700 to 2400.

During the above periods, bridge openings will be restricted to every hour on the hour. At other times, and during the balance of the year, arrangements can be made to have the bridge opened if a twenty-four (24) hour notice is given to the Superintendent-in-Charge, Department of Indian Affairs and Northern Development, London, Ontario, Canada, telephone 519/679-4040.

There is a 75-foot horizontal clearance between the protection piles and a vertical clearance in the closed position of 15.0 feet at high water.

Chenal Ecarte and Sydenham River to Wallaceburg, Ontario.—The entrance to the Sydenham River is through the Chenal Ecarte from the St. Clair River at the head of Walpole Island about 1¼ miles below Port Lambton. On Walpole Island, the Chenal Ecarte range of lights bearing 138°20′, leads into Chenal Ecarte.

A shoal area near the forks in the East Passage of Chenal Ecarte has been dredged to a depth of 14 feet, with controlling depths in 1964 of from 10 to 12 feet, for the accommodation of gravel traffic to Little Bear Creek 2½ miles south of the forks. Shoal areas at the mouth of Chenal Ecarte, at Johnston Bend, Dark Bend, and near the sugar factory on the Sydenham River were dredged to 20 feet in 1956.

Wallaceburg, Ont., is situated on the Sydenham River about 12 miles distant from the St. Clair River via the Chenal Ecarte and Sydenham River in which a channel 100 feet wide and 18 feet deep is to be maintained. The town is on the Chesapeake & Ohio Railway. The docking area in the slip of the Dominion Sugar Co. has been dredged to 18 feet, and the area adjacent to the Libby's plant has been deepened to 20 feet.

A new Government wharf, 130 feet long, with an 80-foot by 30-foot warehouse and a turning basin capable of turning ships up to 400 feet long and 20-foot draft, has been constructed downstream of the railway and highway bridges. This facility is no longer maintained to its original standard.

West of the Chenal Ecarte is Johnston Channel, flowing south as a branch of the Chenal Ecarte, with Ste. Anne Island between these water areas. West of Johnston Channel and Chenal Ecarte is Walpole Island, Ont. having several dredged cuts flowing generally south into Lake St. Clair. The westerly boundary of Walpole Island is generally the Chematogan Channel extending from the St. Clair River to Lake St. Clair. To the west of the Chematogan Channel is Squirrel Island fronting a section of the South Channel of the St. Clair River. Bassett Channel flows from the lower end of the South Channel junction with the new Southeast Bend Cutoff Channel, in a southerly direction into Lake St. Clair.

St. Clair Cutoff Channel extends northeastward for about 6 miles between Seaway Island and Bassett Island from the north end of Lake St. Clair ship channel to its junction with South Channel at the southeast end of Harsens Island. The channel is maintained by the Canadian government.

In July 1977, the controlling depth in the cutoff channel was 24 feet except for shoaling along the southeast channel limit and shoaling to 19 feet in the northwest half of the channel at the junction with South Channel.

Vessels are directed not to meet in the St. Clair Cutoff Channel; vessel traffic is managed by the Canadian Coast Guard, Sarnia Vessel Traffic Center, on VHF-FM channel 11 (156.55 MHz).

In April 1978, rock dykes for containment facilities were under construction on the northwest side of the cutoff channel at the southwest end of Seaway Island. Caution is advised in this area.

Aids to Navigation.—A lighted buoy is located on the east side at the junction of the Lake St. Clair Ship Channel and the Cutoff Channel extending northeast. Along the Cutoff Channel, a series of 9 permanent white towers on concrete bases, each located 190 feet outside the channel limit and surrounded by protective rip-rap, display flashing green lights on the northwest side and flashing red on the southeast side. Both edges of the banks of the maintained channel are marked with unlighted buoys midway between the light towers. A black and red horizontally banded spar buoy marks the northeasterly junction of the Cutoff Channel and the St. Clair Flats Canal. The Squirrel Island Range Lights, exhibited from skeleton towers at the northeast end of the new channel, display fixed yellow lights with rectangular orange daymark and a black vertical stripe. The rear light is 3,506 feet 064¼° from the front light.

Downbound vessels entering St. Clair Cutoff Channel are cautioned to turn well before crossing Squirrel Island Range because of a shoal which extends from the north part of Bassett Island to the southeast edge of the channel.

Coast Guard Station.—St. Clair Flats Canal Coast Guard Station is located on the northwesterly side of the river south channel at the front light of the St. Clair Flats Canal Range.

St. Clair Flats Canal—South Channel.—This channel extends from the Lake St. Clair ship channel along the northwest side of Seaway Island and bends eastward along the south shore of Harsens Island to the junction with St. Clair Cutoff Channel at Southeast Bend. From the junction, South Channel continues northeast for about 6.2 miles to the junction with North Channel at the north end of Russell Island Shoal.

This winding channel has good available depths and is marked by a number of range and passing lights main-

tained by the United States along its northerly side, and by passing lights maintained by the Canadian Government on its southerly side. The American shore line is characterized by the many summer cottages and clubhouses with landings for excursion and summer resort traffic. With the opening of the new St. Clair Cutoff Channel, that part of the old Southeast Bend Section of the St. Clair Flats Canal South Channel between the head and the mouth of the new Cutoff Channel, is not maintained as a deep draft navigation channel.

Channels.—From the junction with Cutoff Channel to the north end of Russell Island Shoal, South Channel is maintained at the Federal project depth of 27 feet.

The earth dike along the southeast edge of St. Clair Flats Canal south entrance is reported to be submerged during periodic high water conditions. It is reported that several small boats have struck the dike when it was submerged. Mariners are advised to use caution when in this area.

Currents.—Vessels transiting South Channel are advised to favor the east side of the channel north of Russell Island due to the strong set of the current from the main river channel into North Channel.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake crib of the Old Club is located on the northwesterly channel edge of the St. Clair Flats Canal at a point 8,500 feet 036° from St. Clair Flats Canal Light No. 2 located on the south end of the earth dike. The crib is not marked.

To the northwest of the St. Clair Flats Canal—Southeast Channel is the Middle Channel. Between these channels are **Russell Island** at the most northerly end, and **Harsens Island** with **Little Muscamoot Bay** and then **Big Muscamoot Bay** extending into Lake St. Clair. The North Channel flows from the St. Clair River in a westerly direction around the Michigan mainland and into Anchor Bay. The island between the Middle Channel flowing southwest from the North Channel, and the North Channel, is **Dickinson Island** with Fisher Bay on the west side of the island extending into Goose Bay which in turn opens into Anchor Bay. There are many channels from the westerly end of the North Channel with most of them passing into only a few feet of water.

Disposal Area-Harsens Island.—A 22 acre diked disposal area built by the State of Michigan is in Middle Channel on the west side of Harsens Island about 1¼ miles below the junction with North Channel.

Disposal Area-Dickinson Island.—Two irregularly shaped disposal sites are on the north side of the island. The eastern area is 1,450 feet wide, 4,200 feet long. The western area is 1,100 feet wide, 2,500 feet long. Large stone is used on the river side with earth dikes on the remaining sides.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake crib of the Colony is located on the North Channel just west of the junction with Chenal A Bout Rond Channel. The crib is 8,200 feet 265° from the tower just west of Pearl Beach. It is not marked.

Wreck.—A wreck is located on the west edge of the Middle Channel about 750 feet 228° from the middle of the aerial cable over Chene Highway. The wreck is 190 feet by 30 feet and extends in a NE–SW direction. The highest part of the hull extends 2 feet above Low Water Datum. A buoy is located channelward of the wreck.

Wreck.—A wreck is located on the east edge of the Middle Channel at a point about 1,600 feet 244° from the south end of the highway bridge over Snooks Highway. A buoy is located about 10 feet westerly of the wreck.

Wrecks.—Two old sunken vessels are located in Chenal A Bout Rond approximately ¾ mile downstream from the junction of Chenal A Bout Rond and the North Channel. The vessels are near the northwest bank in natural depths of about 25 feet. The least depth over these obstructions is approximately one foot.

Algonac, Mich.—A village and summer resort opposite Russell Island, at the head of North Channel. It has yards for motorboat building and docks with 12 to 15 feet of water. Automobile ferry service is available from just west of Algonac on the mainland, across the North Channel to Harsens Island. Most of the year, car ferry service is also available from Algonac to Walpole Island and an American Customs office is located at the ferry dock in Algonac.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake crib of the village of Algonac, Mich., is located 3,000 feet 071° from the tank in Algonac. There is a depth of 32 feet over the crib and it is not marked.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 74, St. Clair county. R 281.774.8. Channels and canals, city of Algonac; slow—no wake speed.

8. On the waters of all other channels and canals, city of Algonac, county of St. Clair, state of Michigan, * * *

Russell Island Shoal.—Algonac is cut off from direct access to the main or South Channel of the St. Clair Flats by Russell Island Shoal, a shallow bank extending in a northeasterly direction about 2,600 feet from the head of Russell Island. At the outer end of the shoal is a black and red striped lighted buoy, which marks the midstream dividing point of the North and South Channels of the St. Clair River delta. The east and northeast parts of the original shoal have been removed in order to enlarge and straighten the entrance to the main or South Channel. The main channel at this locality is 27 feet deep.

Walpole Island.—To the east across the river from Algonac is the car ferry dock on Walpole Island. A Canadian Customs office is located on the dock facility. The facility includes a pile and timber wharf 105 feet long on the western side of the island, providing accommodation for ferry service and pleasure craft, and general shipping service. A light, 14 feet above the water on a steel mast, marks the west end of the north breakwater.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is located on Walpole Island.

Port Lambton, Ontario.—A village about one mile above the Chenal Ecarte, and on the line of the Chesapeake & Ohio Railway. There is one wharf with a depth of 20 feet, and a second wharf of steel pile construction for berthing small craft, which has an available depth of 9 feet along the river face and in the inner basin.

Ferry.—A ferry operates year round, depending on ice conditions, across the river between Port Lambton and Roberts Landing, Mich.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is located at Port Lambton.

About 2 miles northeasterly of Port Lambton, about opposite the Salt Dock Light on the Michigan side, a shoal area extends upstream to **Fawn (Woodtick) Island** on the Canadian side of the river.

The channel passing to eastward of Fawn (Woodtick) Island and the middle ground has a width of not less than 400 feet and depth of 18 feet of water, but is slightly winding and unmarked, and is less frequently used than the main channel west of Fawn (Woodtick) Island.

Charts 14852, 14853.—Above Fawn (Woodtick) Island, the shoal area extends approximately 1½ miles further opposite Marine City. The shoal ground has a minimum depth of 12 feet on the International Boundary opposite the city.

Channels.—The main vessel channel passes on the west side of Fawn Island and the shoals extending north from it and is maintained at the Federal project depth of 27 feet. It is well marked by a light and lighted buoys.

Marine City, Mich.—This is one of the larger communities located on the Michigan side of the river about 7½ miles above Algonac. The **Belle River** runs from north to south through the village and empties into the St. Clair River near the southerly limits of the village.

In 1968, the controlling depths were 7 feet from the mouth of Belle River for about 0.5 mile to Bridge Street bridge, thence 4 feet for another 0.5 mile to the Broadway bridge. The channel is subject to shoaling.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. An intake pipeline of the village of Marine City, Michigan is located about 4,500 feet northeast of the mouth of the Belle River. It extends about 200 feet from shore to a crib with 35 feet of water over the crib. It is not marked.

Harbor facilities.—McLouth Yards, Inc. receives crushed limestone and coal at a wharf on the west side of St. Clair River just south of the mouth of Belle River. The 1,200-foot wharf has a reported depth of 35 feet alongside and a deck height of 5 to 8 feet. The facility has 12½ acres of open storage.

Small-craft facilities on the west bank of the Belle River within 0.5 mile of the mouth provide gasoline, diesel fuel, water, ice, electricity, marine supplies, a

Structures Across the Belle River at Marine City

No.	Location and name	Kind	Miles above mouth of river	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Submerged cable		0.17						
2	do		0.20						
3	Bridge Street bridge	Highway	0.48	40	40		7.1		Left draw only available. Bridge not operable.
4	Submerged cable		.55						Approximate depth not known.
5	Aerial cable		0.75						
6	Broadway (M-29) bridge	Highway	1.04			32.1	7.9		Fixed.
7	Aerial cable		1.11						
8	do		1.44						
9	do		1.55						
10	do		1.87						
11	Meisner Road bridge	Highway	3.57						

Signal for opening draws, 3 blasts (— — —).
Bridges are lighted according to U.S. Coast Guard regulations for lighting bridges.

pump-out station, a launching ramp, a 20-ton hoist capable of hauling out 42-foot craft, and hull, engine, and electronic repairs.

Ferry.—A ferry operates year round, depending on ice conditions, from Marine City, about 0.6 mile north-northeast of the mouth of Belle River, across the St. Clair River to Sombra, Ont.

Harbormaster.—The Marine City Chief of Police acts as harbormaster and enforces the regulations of St. Clair County and the State of Michigan. Copies of regulations may be obtained from the chief of police.

Slow—No Wake Speed.—See Regulations State of Michigan, preceding. Regulation No. 74, St. Clair county.

R 281.774.9. Belle river, part from King road to Marine City; slow—no wake speed.

9. On the waters of the Belle river, section 24, 25, and 36, town 4 north, range 16 east, township of East China, county of St. Clair, state of Michigan, downstream from King road to the north city limits of Marine City, * * *

R 281.774.10. Belle river, part in Marine City; slow—no wake speed.

10. On the waters of the Belle river, sections 1 and 12, town 3 north, range 16 east, within the limits of Marine City, county of St. Clair, state of Michigan, * * *

Sombra, Ontario.—This is a small village on the east channel, opposite Marine City, and on the line of the Chesapeake & Ohio Railway. A public wharf consisting of steel sheet piling, filled with gravel, approximately 307 feet long by 145 feet wide, serves as a landing wharf for the ferry-boat running to Marine City. A timber pile bent causeway, 236 feet long by 20 feet wide, with concrete deck, connects this public wharf with the mainland. On the south side of this wharf and causeway is a refuge for small boats drawing up to 4 feet of water.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is at Sombra.

At Stokes Point, about 1¾ miles above the village there is a landing used as a sand dock, comprising a gravel-filled pile pierhead 120 feet long on the river face by 100 feet wide, and a short approach 120 feet long by 20 feet wide, supported on piles; that depth at the face of the dock is about 15 feet. Stokes Point Wharf Light is displayed 30 feet above the water from a white circular steel tower with a red top, located about 20 feet shoreward from the southeast corner of the sand dock.

Wreck.—Between Marine City and the city of St. Clair, the submerged wreck of the steamer TOKIO lies 150 feet from shore at a point 1,800 feet below the lower end of the Edison coal dock. In 1963, the wreck was removed to a depth of 14 feet.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake crib of the East China Township in Michigan is located just upstream of the wreck of the TOKIO. The crib, with 16 feet of water over it, is 3,100 feet 190° from the Detroit Edison Co. stack at Recors Point. The crib is not marked.

St. Clair, Mich.—The city of St. Clair is located about 7½ miles north of Marine City. The Pine River is a small stream 100 to 150 feet wide, emptying into the St. Clair River near the southerly limits of the city.

In 1975, the controlling depths in Pine River were 10 feet through the mouth, thence 6 feet to a point 0.4 mile above the mouth decreasing to 4 feet 1.3 miles above the mouth. The channel is subject to shoaling.

Harbor Facilities.—The city of St. Clair and Michigan State Waterways Comm. have jointly developed docking and launching facilities on the Pine River, immediately upstream of the M-29 Highway Bridge. Gasoline, diesel

Structures Across the Pine River

No.	Location and name	Kind	Miles above mouth of river	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
0	Submerged cable		.05						Depth unknown.
1	Riverside* (M. 29) bridge.	Highway	0.06						Bascule. Under construction 1977.
1A	Submerged cable		.13						Depth unknown.
2	do		.15						Do.
3	Aerial cable		46				68.0		
4	Submerged pipeline		.46						Do.
5	Port Huron & Detroit RR. bridge.	Railroad	2.03						

*Signal for opening draw, 1 long, 1 short (— —).

Bridges are lighted according to U.S. Coast Guard regulations for lighting bridges.

fuel, water, ice, electricity, a pump-out station, and a launching ramp are available. In 1977, depths of 3 to 15 feet were reported available at the facility. Another facility on the west side of the river about 1.4 miles above the mouth provides gasoline, diesel fuel, water, ice, electricity, marine supplies, a pump-out station, a launching ramp, a 30-ton hoist, and hull, engine, and electronic repairs.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. From a point 2,100 feet north of the mouth of the Pine River in the city of St. Clair, an intake pipeline of the city of St. Clair, Mich., extends about 900 feet easterly into the main navigation channel in the St. Clair River to a crib in 30 feet of water. There is a depth of 27 feet of water over the crib and it is not marked.

Bridge Regulations.—See 33 C.F.R. § 117.703 of Rules and Regulations, preceding.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 74, St. Clair county. R 281.774.14. Pine river in city of St. Clair; slow—no speed restriction.

14. On the waters of the Pine river, city of St. Clair, St. Clair county, within the city limits, * * *

The river opposite the city of St. Clair is divided into two channels by the middle ground shoals, **St. Clair Middle Ground,** which extends about 1½ miles from just below the outlet of the Pine River, northerly to about opposite Mooretown, Ontario.

The deep-draft channel for traffic is around the westerly side of the middle ground shoals and is maintained at the Federal project depth of 27 feet. Mariners should exercise caution while negotiating the westerly turn when downbound to avoid the middle ground shoals at St. Clair. The lower and upper mid-river points of these shoals are marked with buoys. Buoys also mark the edge of the middle ground on the east line of the American channel, at points between the two end buoys above mentioned.

The Canadian Channel, formerly for upbound traffic, and not to be maintained, had a depth of 24 feet or more with a minimum width of about 400 feet in 1961.

Water Supply Intakes.—A large water intake pipeline of the C.I.L. plant at Courtright extends into the St. Clair River. The pipeline commences at a point about 3,000 feet 172° from the bridge at Bowens Creek, and extends 485 feet 270° to a crib. There is a depth of 35 feet of water over the crib and it is not marked.

A water intake pipeline commences at a point about 2,150 feet 163° from Courtright Light, and extends 200 feet 248° to a crib in about 18 feet of water. There is a depth of 11 feet over the crib which is marked at the outer end with a buoy.

Lambton Station.—This power generating station is on the east side of the river about 1 mile south of Courtright, Ontario. In 1977, the 1,000-foot coal receiving wharf had reported depths of 28 feet alongside.

Courtright, Ontario, is a village on the Canadian channel opposite St. Clair, and on the Chesapeake & Ohio Railroad. There are depths of 15 to 20 feet along the wharves, which are mostly in ruins.

Mooretown, Ontario, is a village 1½ miles above Courtright, at the northerly end of the Canadian channel, and on the Chesapeake & Ohio Railway. There is a wharf with about 12 feet of water at the end. A flashing yellow light is shown about 30 feet shoreward from the northwest corner of the town wharf. **Baby Creek** enters the St. Clair River about ⅓ mile below the village.

Channels.—The main channel follows the western side of the river above St. Clair and about one mile above St. Clair Middle Ground Lighted Buoy 50 opposite Mooretown, Ont., continues about 3½ miles to the west of the shoal area extending below **Stag Island, Ontario,** around Stag Island and the shoal area north of Stag Island and opposite **Marysville,** Mich. The lower end of the shoal below Stag Island, is marked with a lighted buoy at midriver, two buoys along the easterly channel edge opposite Stag Island, and a lighted buoy at midriver at the northerly end of the shoal. Buoys mark the west channel bank at the bend at the south end of the channel, Stag Island Middle Light is on the west channel (Marysville) bank between the north and south ends of Stag Island. The westerly bank is also marked by a light on the upstream corner of the dock in Marysville. The main channel to the west of Stag Island is maintained at the Federal project depth of 27 feet.

Small-craft facility.—A small-craft wharf on the west side of the river opposite the foot of Stag Island provides gasoline, water, and electricity.

Ferry Service.—A ferry service is operated from Stag Island to a dock at the foot of Hill Street in Corunna, Ont.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. From the upstream end of the dock in Marysville, an intake pipeline of the village of Marysville, Michigan, extends into the main channel of the river about 600 feet. The pipeline extends to a crib having 28 feet of water over it. The crib is not marked.

The Canadian Channel, formerly for upbound traffic, and not to be maintained, had a depth of 21 feet or more for a minimum width of 500 feet at a point near the upper end of Stag Island, as determined by sounding in 1950. A light, shown from a tower near the south end of the shallow area extending downstream from Stag Island, marks the former lower entrance, and the Corunna range marks the upper entrance to the Canadian channel.

Corunna, Ontario, is a village on the Canadian channel east of Stag Island, and on the line of the Chesapeake & Ohio Railway. A range of lights, bearing 167°15′, guides past the shoals at the head of Stag Island and also past the shoals off the mouth of **Talford Creek** north of Corunna.

Harbor facilities.—Shell Canada, Ltd. operates a 2,000-foot offshore wharf on the east side of St. Clair River north of the mouth of Talford Creek. Petroleum products are shipped and received, and bunkering is available.

Water Supply Intake.—A water intake pipe, for the Du Pont Plant at Corunna, extends into the river from the Canadian shore just northeast of the northerly end of Stag Island. The outer end, with a depth of 17 feet over the crib, is marked by a privately maintained aid.

Shoal Area.—A shoal area with a least depth of 16 feet is located on the east side of the St. Clair River opposite the Morton Salt Co. in Marysville, Mich. A buoy marks the southerly side of the shoal.

River—Port Huron and Sarnia.—The St. Clair river above Marysville and Stag Island flows southwest under the Blue Water Bridge between the cities of Port Huron, Michigan, on the west bank and Sarnia, Ontario, on the east bank and comes from the dredged channel in the shallow section at the lower end of Lake Huron. The rapids section of the river at Port Huron extends from 200 or 300 feet below to about 1,000 feet above the Blue Water Bridge. The Fort Gratiot range, located on the shore about one mile south of Fort Gratiot Lighthouse, guides 207¼° through the rapids from the intersection of this range with the Point Edward range.

There is good holding ground in clay or gravel between Port Huron and Sarnia.

Channels.—From Stag Island to its upper terminous at Lake Huron, the St. Clair River is maintained at the Federal project depth of 27 feet.

Structures Across Black River at Port Huron

No.	Location and name	Kind	Miles above mouth at river channel line	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Black River								
1	Submerged cable		0.08						No data.
2	Chesapeake & Ohio Ry bridge.	Railway	.09			100.0	6.7		Bascule.
3	Submerged pipeline	Sewer	.15						Sipon. 2-20″ pipes.
4	do	Water	.30						20″ cast iron.
5	Submerged cable		.31						No data.
6	Military St. bridge	Highway	.33			65.0	11.5		Bascule.
7	Submerged cable		.44						No data.
8	7th St. bridge	Highway	.50			83.5	13.0		Bascule.
9	Submerged pipeline	Sewer	.50						20″ cast iron.
10	Submerged cable		.54						No data.
11	do		.59						Do.
12	Submerged pipeline	Water	.80						20″ cast iron.
13	10th St. bridge	Highway	.94			90.0	18.8	14.8	Bascule.
14	Submerged pipeline	Water	1.20						20″ cast iron.
15	Grand Trunk Western RR. bridge.	Railway	1.56			80.0	13.5		Bascule.
15A	Aerial cable		1.76				69		
16	Aerial cable		2.05				79.0		
17	Michigan (I-94) bridge	Highway	2.30			117.0	20.0		Fixed.
17A	Aerial cable		2.33				40.0		
18	do		2.49				46.0		
19	do		2.85				64.0		
20	Submerged cable		2.85						No data.
	Black River Canal	Junction	4.34						
21	Aerial cable		4.36				41.0		

Signals for opening draws, 1 long, 1 short (— –). When draw can be opened promptly, same signal requested; if not, or if bridge must be closed while open, four short blasts will be sounded.

Bridges are lighted accordingly to U.S. Coast Guard regulations for lighting bridges.

At midstream, just about a point opposite the mouth of the Black River, a special purpose buoy marks the separation for upbound and downbound traffic.

Caution.—At the upper end of the American or downbound channel, between the Port Huron waterworks and the Blue Water bridge, will be found at times a current of 4 miles or more per hour. Masters of vessels are warned to hold well up when turning into the downbound channel because of the velocity of flow and the cross currents which tend to carry vessels to the eastward.

By reason of the proximity of this channel to Port Huron wharves and shipping, vessel masters should check speed to the lowest safe limit and be careful to avoid damage or hazard to such shipping.

The following navigation orders have been promulgated by the Commander, Ninth Coast Guard District, and apply to all commercial vessels, including tug and tow combinations, 65 feet or greater in length.

Zone of no meeting, overtaking or coming about. There will be no meeting, no overtaking, and no coming about in a zone extending between Lake Huron Cut Lighted Buoy 1 and the Port Huron Traffic Lighted Buoy. Coordination of vessel movement to avoid meeting in this zone will be by vessel masters. Downbound vessels will make security calls at the Lake Huron Cut Lighted Buoy 11, at Lake Huron Cut Lighted Buoy 7, and Lake Huron Cut Lighted Buoy 1. Upbound vessels will make security calls when abeam St. Clair River Lighted Buoy 58, when abeam of the Polymer Corporation Limited Chimney ½ mile north of Dow Chemical of Canada Limited, and at Port Huron Traffic Lighted Buoy.

Each security call will include vessel's name, position, direction of transit and ETA at either Lake Huron Cut Lighted Buoy 1 or the Port Huron Traffic Lighted Buoy as appropriate. Downbound vessels which have passed Lake Huron Cut Lighted Buoy 7 have the right of way through the zone over upbound vessels which have not yet entered the zone. Upbound vessels awaiting transit of downbound vessels will maintain position south of the Port Huron Traffic Buoy. Transiting vessels shall have right of way over vessels which are moored within the zone. Vessels departing a mooring within the zone will subordinate their movements to that of through traffic. Vessels within this zone, whether underway or moored, desiring to reverse their direction of heading shall do so outside the zone. **Note:** At some future date, these regulations will be included in **33 CFR 162.135.**

Port Huron, Mich.—This city is located at the south end of Lake Huron. The outflow of water from Lake Huron flows through the St. Clair River on which the city of Port Huron fronts the westerly side. Sarnia, Ontario, occupies a similar position on the east side of the river directly opposite Port Huron. The Black River passes through the city in a southeasterly direction and empties into the St. Clair River about 2¼ miles below its head, or the foot of Lake Huron.

The improvement work in the St. Clair River is described under the heading "River-Port Huron and Sarnia" above.

Channels.—A dredged channel leads from the mouth of Black River upstream for 4.4 miles. In 1977, the controlling depths were 18 feet from the mouth to the Military Street bridge, thence 11 feet to Tenth Street bridge, thence 8 feet to the Grand Trunk Western Railroad bridge, thence 7 feet to the I-94 bridge, thence in March 1978, 2½ to 5 feet to the upper limit of the project. The channel is subject to shoaling.

Fluctuations of Water Level.—Each year the level of the Black River rises and falls from 4 to 6 feet, due to the fact that the spring freshets raise the level considerably above the normal. From day to day the level changes somewhat, due to wind, such changes amounting to several inches.

Aids to Navigation.—A light is maintained on the north side of the mouth of the Black River, 4.625 feet 181½° from Bay Point Light located northerly on the Ontario shore. Fort Gratiot Light, shown 82 feet above the water from a white conical tower, is on the west side of the north entrance to the St. Clair River. A radiobeacon is near the light.

Harbor Facilities.—The city of Port Huron and the Michigan State Waterways Commission have constructed the following facilities:

a. A mooring facility just downstream of Military Street on the east side of the Black River. This facility can accommodate 20 watercraft. Water and electric services, as well as area lighting are provided at this location.

b. A mooring facility just downstream of 7th Avenue on the east side of the Black River that can accommodate 15 transient watercraft. Electricity is available.

c. A mooring facility for 95 watercraft located on the east side of the Black River between 7th and 10th Avenues. This accommodation includes area lighting, electric and water service, sewage pump-out facilities, and fuel services. In addition, toilet and shower accommodations are provided.

d. A mooring basin capable of accommodating 102 watercraft. This facility is located just downstream of the I-94 bridge of the west side of the Black River and provides water, electric, fuel, and sewage pump-out facilities as well as toilet accommodations and area lighting.

Slow—No Wake Speed.—See Regulations State of Michigan, preceding. Regulation No. 74, St. Clair county. R 281.774.3. Black river, portion of; speed restriction.

3. On the waters of the Black river, commencing at its mouth of the St. Clair river to the Grand Trunk Western railroad bridge, a distance of 8000 feet, more or less, city of Port Huron, county of St. Clair, state of Michigan, * * *

R 281.774.4. and R 281.774.11. Black river, portion of; speed restriction.

4 and 11. On the water of the Black river, commencing at a point 600 feet southeast of the interstate highway 94 bridge to a point 800 feet northwest of the said bridge, sections 3 and 4, town 6 north, range 17 east, county of St. Clair, state of Michigan, * * *

R 281.774.5. and R 281.774.12. Black river, portion of; speed restriction.

5 and 12. On the waters of the Black river commencing at a point 1000 feet south of the intersection of the Black river and the Black river canal, to a point 500 feet northwest of said intersection, section 27, town 7 north, range 17 east, county of St. Clair, state of Michigan, * * *

R. 281.774.13. Black river, portion of; speed restriction.

13. On the waters of the Black river, commencing at a point 100 feet south of the intersection of the Black river and the Black river canal to a point 500 feet northwest of said intersection, section 27, town 7 north, range 17 east, township of Fort Gratiot, county of St. Clair, state of Michigan, * * *

Coast Guard.—Port Huron Coast Guard Station is located on the west side of the entrance to the St. Clair River, at the Fort Gratiot Light.

National Weather Service Warning Display Station.—Signals are displayed at the Coast Guard station.

Outfall Sewer.—A sewer outfall pipeline of the city of Port Huron, is located 285 feet south of the north stack of the Sewage Treatment Plant. The pipeline extends 128 feet 094° into the St. Clair River and is not marked.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline of the City of Port Huron extends 100 feet 070° into the St. Clair River from the face of the dock at the Waterworks in Port Huron. There is a clearance of approximately 33 feet of water over the intake crib, and the crib is not marked.

Bridge.—The Blue Water Bridge, completed in 1938, extends from Port Huron to Point Edward, Ontario. The bridge has a cantilever span across the river, with vertical underclearance for a length of 200 feet at midstream of 155.2 feet decreasing to 135 feet at points 300 feet east and west of the center of the span. Four fixed red lights mark the channel limits and two flashing green lights are located at the center of the span, on the axis of the Fort Gratiot range; the lights are suspended from the lower chords of the bridge.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding, and 33 C.F.R. § 117.702 of Rules and Regulations, preceding.

Sarnia, Ontario.—A city near the head of St. Clair River, opposite Port Huron and connected therewith via Point Edward by the Blue Water Highway Bridge across the river, and by a railroad tunnel under the St. Clair River. It is an important harbor of the Canadian National Railway.

Harbor Front.—From the foot of George Street, 19 feet can be carried close to shore in front of and below the Canadian National depot, and continuing down to the Imperial Oil Ltd.'s dock. A channel 2,400 feet long, leading to the Centennial Park and to wharves fronting the river in this area, has been dredged to a depth of 20 feet, with a turning basin for 300-foot boats near its inner end.

Soundings taken in October 1963 showed a controlling depth of 18 feet in the channel.

A dredged slip extending eastward from Bay Point and along the front of the Sarnia elevator and the Government dock has a minimum width of 400 feet. In September 1977, the reported controlling depth was 27 feet in the approach and along the dockline except for the elevator dock which has a controlling depth of 24 feet. The Government dock, 1,047 feet long, is on the southerly side of the elevator slip, extending westerly from the inner end. The easterly 1,047 feet is a timber and sheet pile revetment along a fill about 325 feet wide on which are five warehouses giving a total storage area of 35,000 square feet. Dredging to 27 feet was carried out in 1977 in a triangular area 500 feet by 950 feet immediately west and south of the west end of the wharf.

A winter storage basin, north of the elevator slip and adjacent to Bay Point, had a reported controlling depth in September 1977 of 27 feet with length of 1,900 feet north and south and width of 250 feet. A row of dolphins the entire length of the slip marks the eastern side of the winter storage basin. Vessels moor to these dolphins during periods of storage and repairs. The western side of the basin is marked by a row of deteriorated dolphins.

Facilities for small craft are available along a channel extending easterly from the north end of the slip. There is a Customs Reporting Station for small craft at the extreme north end of the winter storage basin.

The anchorage near the head of the St. Clair River, below the rapids and abreast of Sarnia, is good in clay and gravel. Good holding ground and some eddy will be found on the Canadian shore below the Canadian National Railway dockage. Vessels should anchor as close to shore as safety will permit, to leave the midchannel clear for passing vessels. In 1962, the southerly end of Bay Point Shoal was dredged to 23 feet.

Aids to Navigation.—Bay Point Light is located on the point inclosing Sarnia Bay. The westerly edge of a shoal area extending into the river off Bay Point is marked with a buoy.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is located in Sarnia at the Bridge View Marina.

Radio Facility.—Canadian Coast Guard Radio Sarnia is operated continuously during the navigation season. Extended range ship-shore VHF transmitting and receiving facilities at Leamington, and Kincardine, Ont. are remotely controlled from this station.

Water Intake.—A water intake pipeline of the Imperial Oil Ltd. extends 200 feet 200° into the St. Clair River from the shore line 2,400 feet below the railroad tunnel. There is a clearance of 24 feet over the intake crib and the crib is not marked.

Outfall Pipelines.—A sewer outfall of the City of Sarnia is located at the foot of Clifford Street approximately 900 feet below the railroad tunnel and extends approximately 300 feet northwesterly into the St. Clair River.

Point Edward, Ontario.—Situated at the head and on the east side of the St. Clair River, adjoining the City of Sarnia, and connected with Port Huron, Mich., by the Blue Water Bridge. It is an important shipping terminal of the Canadian National Railway and a port of call for many large Canadian vessels. The Canadian Government maintains a channel about 21 feet deep along the front of the docks, to afford safe entrance and exit for

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vessels. The locality is subject to continual shoaling and requires dredging for maintenance of the channel.

Aids to Navigation.—Point Edward Range Lights lead into the St. Clair River from Lake Huron. The front light is on the beach 120 feet back from the water's edge, and the rear light, on the Blue Water Bridge, is 2,400 feet 180° 20′ from the front light. This range should be followed until intersected by the Fort Gratiot range. A radar transponder beacon (Racon) is at the front light.

Outfall Pipeline.—A sewer outfall pipe extends 95 feet 285° into the St. Clair River from a point on the east shore approximately 45 feet south of the center line of the Blue Water Bridge.

Water Intakes.—The City of Sarnia water intake cribs, with least depths of 34 feet, are located about 1,200 feet and 1,500 feet respectively, upstream from the Blue Water Bridge, and 250 feet offshore. They are not marked at the outer end, but signs along the seawall at the shoreline indicate "Do Not Anchor".

Wreck.—The wreckage of an old wooden vessel is located above the Blue Water Bridge, 1,170 feet 140° from Fort Gratiot Light. The wreckage was cleared to a depth of 30 feet in 1960.

Small Boat Basin.—The entrance to the basin of the Sarnia Yacht Club, marked by a private lighted range and by private lights, is located about 1,000 feet east of the Point Edward Front Range Light.

10. LAKE HURON

Depths and vertical clearances under aerial crossings and bridges herein given are referred to Low Water Datum, which for Lake Huron is an elevation 576.8 feet above mean water level at Pointe-au-Pere (Father Point), Quebec, on International Great Lakes Datum (1955).

DIMENSIONS, ETC.

Length, steamer track, De Tour Passage to Fort Gratiot ----------miles--	223
Length, steamer track, Straits of Mackinac to Fort Gratiot----------miles--	247
Length (right line), Drummond Island, at nearest point to entrance of False Detour, to Harris Point ----------miles--	206
Breadth (right line), about 44°35′ north latitude miles--	101
Depth, maximum recorded by NOS---------feet--	750

Areas in square miles:

	United States	Canada	Total
Water surface of lake*-----	9,150	13,900	23,100
Entire drainage basin*-----	25,300	49,500	74,800

*Including St. Mary's River below Brush Point, North Channel, and Georgian Bay.

GENERAL DESCRIPTION

Fluctuations of Water Level.—The average or normal elevation of the lake surface varies irregularly from year to year. During the course of each year the surface is subject to a consistent seasonal rise and fall, the lowest stages prevailing during the winter months and the highest during the summer months.

In addition to the annual fluctuation there are also oscillations of irregular amount and duration produced by storms. Some, with periods of a few minutes to a few hours, are the result of squall conditions, the fluctuations being produced by a combination of wind and barometric pressure changes that accompany the squalls. At other times the lake level is affected for somewhat longer periods, such as many hours or a day, by strong winds of sustained speed and direction which drive the surface water forward in greater volume than that carried by the lower return currents, thus raising the elevation on the lee shore and lowering it on the weather shore. This result is materially augmented in bays and at extremities of the lake, where the impelled water is concentrated in a restricted space by the converging shores, especially if coupled with a gradually sloping inshore bottom which reduces the depth and checks the reverse flow via lower currents. The latter condition is very pronounced at the mouth of Saginaw River.

Anchoring of Vessels.—Cautionary Notice.—When coming to anchor vessels masters are cautioned not to foul submarine cables. Fouling cables may not only result in disrupting utility services to adjacent communities but also expose the mariner to the danger of high voltages carried by certain cables. Mariners are advised to slip the anchor rather than cut the cable if the normal practice of good seamanship fails to clear the fouled anchor. Lost gear or damaged cables should be reported to the authority having jurisdiction over the waterway.

Weather Conditions.—The configuration of Lake Huron is such that winds from any quarter may stir up considerable wave action. The long fetch of strong northeast and east winds over the waters from Georgian Bay to the Michigan shore develop high seas which run athwart the north and south courses of traffic through the lake. Winds from the south may be dangerous, especially in the northern converging shores of this lake and north winds are dangerous in the pointed southern configuration of the lake, especially near the outlet of it. The highest wind velocity, as derived from long-time records of the National Weather Service for certain shore stations, is 53 knots (61 miles per hour) from the southwest at Alpena, Mich., in November 1940; the shore-station values are subject to the condition that the free flow of the wind is diminished by land friction. The highest velocity as observed on anemometer-equipped vessels while more than 6 miles offshore was 95 knots (109 miles per hour) on 6 August 1965; but such records began in 1941 and self-recording data over a longer period, which could register higher winds, are not available. The records of the Atmospheric Environment Service of the Canada Department of Environment (formerly Meteorological Branch of the Canadian Department of Transport) for near-shore areas of Ontario indicate the maximum wind speeds noted

below in sequence of station, speed, direction, date. These are sustained speeds over a one-hour period at airport locations (A) but one-minute averages at all other stations, and do not show maximum gusts which may be much higher. The speeds are in knots, with the value in miles-per-hour in brackets: Gore Bay A 43 (49) SW, Feb. 1953; Wiarton A 45 (52) SW, Mar. 1956; Great Duck Island 53 (61) NW, Nov. 1970; Southampton 47 (54) W, Dec. 1938; Cove Island 46 (53) NE, Nov. 1966.

Through Navigation.—Lake Huron is a connecting link in the chain of the Great Lakes, which receives the waters of Lake Michigan through the Straits of Mackinac, and those of Lake Superior by way of the St. Marys River, and discharges into the St. Clair River at Fort Gratiot. The depth of water prevailing in these two rivers and in the Detroit River has governed the size and draft of vessels navigating Lake Huron to and from Lakes Superior and Erie.

The improvement of the connecting waters of the Great Lakes between Chicago, Duluth, and Buffalo has provided for through navigation by large vessels of deep draft, which can pass with safety and speed through Lake Huron, a distance of 223 miles between Fort Gratiot and De Tour Passage at the mouth of St. Marys River, and 247 miles between Fort Gratiot and the Straits of Mackinac.

Separate Steamer Lanes for Vessels.—The Lake Carriers' Assocation and the Dominion Marine Association have prescribed, for vessels enrolled in the associations, the following separation of routes for upbound and downbound traffic in Lake Huron:

Downbound vessels shall lay a course from De Tour Passage to pass not less than 15 miles northeast from Middle Island Light, thence not less than 12 miles northeasterly of Harbor Beach Light and thence for the north entrance of Lake Huron Cut.

Downbound vessels from the Straits of Mackinac shall lay a course 070° for 6 miles from a point south of Poe Reef, then shall lay their course to join the regular downbound course from De Tour Passage at a point not less than 15 miles northeast of Middle Island Light.

Downbound vessels from Calcite from a point abreast of Adams Point Lighted Buoy shall lay a course about 100° to intersect the westerly limit of the general downbound course at a point about 15 miles northeast of Middle Island Light.

Downbound vessels from Stoneport Harbor shall lay a course of about 098° to intersect the westerly limit of the general downbound course on Lake Huron at a point about 14 miles 071° from Middle Island Light.

Downbound vessels from Alpena shall head 159°, on Harbor Beach Light, to a point 12 miles above Pointe aux Barques Light, thence haul about southeast to cross upbound traffic and reach the outside lane.

Downbound vessels from De Tour Passage to Cove Island from a position abreast of De Tour Light shall lay a course 137° for 12 miles, thence 123° for 37 miles to a position 10 miles 213° from Great Duck Island Light, thence 102¾° for 61.25 miles to a position with Cove Island Fairway Buoy abeam.

Downbound vessels from Cove Island to the north entrance of Lake Huron Cut from a position abreast of Cove Island Fairway Buoy, shall lay a course 225° for 7 miles, thence 188¾° for 151 miles to the north entrance of Lake Huron Cut.

Upbound vessels on Lake Huron shall lay a course to pass not over 5 miles 067° off Harbor Beach Light and not over 7 miles 071° off Middle Island Light.

Upbound vessels on Lake Huron bound for Straits of Mackinac shall lay a course for Poe Reef Passage from a point not over 5 miles 050° from Presque Isle Light to abreast of Cordwood Point Lighted Buoy.

Eastbound vessels from Round Island Passage shall lay a course 090° to a point about 4¾ miles off Martin Reef; thence to a point ¾ mile southeast of De Tour Light.

Upbound vessels from the north entrance of Lake Huron Cut to Cove Island Fairway Buoy, from a position abreast of the north entrance of Lake Huron Cut, shall lay a course 036½° for 15 miles, thence 007¾° for 143½ miles to Cove Island Fairway Buoy.

Upbound vessels from Cove Island to De Tour Passage, from a position abreast of O'Brien Patch Buoy, shall lay a course 284° for 61½ miles to a position 6 miles 194° from Great Duck Island Light, thence 300° for 48 miles to a position 3 miles 137° from De Tour Light, thence to De Tour Light.

It is understood that masters may exercise discretion in departing from these courses when ice and weather conditions are such as to warrant it.

The recommended courses are designated on the general chart No. 14860, Lake Huron.

It is recommended that the following limit of anchorage be observed in Lake Huron off De Tour Light so that vessels may enter or leave De Tour Passage in time of congestion due to fog or other conditions: No vessel to anchor east of a bearing on De Tour Light of 340°, or closer than ¾ mile to the light or north of the De Tour Martin Reef course.

Local Traffic—Harbors and Improved Channels.—The only ports along the west coast of Lake Huron with sufficient depth of water to accommodate the largest vessels for loading and unloading are harbors and docks that have been created by and for private interests. At Alabaster, near Tawas City, the United States Gypsum Co. has a crib dock in 23 feet of water, connected to shore by a tramway, for loading gypsum rock; at Port Gypsum, a dock for loading gypsum rock has been constructed and an approach channel, 19 feet deep, has been dredged; at Alpena, the Huron Portland Cement Co. has extensive docks for handling stone, cement, and coal, with entrance channel and slips deepened to 23 feet, and also a large dock formerly used for shipping stone, with entrance channel dredged to 19 feet; at Rockport, there are the remains of a dock formerly used for handling limestone and coal, with entrance channel and slips deepened to 21 feet; at Stoneport, the Presque Isle Corp. has an L-shaped breakwall and dock for shipping stone, with controlling depth of 25 feet along dock face; at Calcite, Michigan Limestone Division, U.S. Steel Corp. has a

harbor and facilities for handling limestone, protected by a breakwater and with entrance channel and slip deepened to 25 feet; and at Port Dolomite, Michigan Limestone Division, U.S. Steel Corp., has a dock for shipping stone, with controlling depth of 22 feet along dock face.

At Lexington, the United States has constructed a harbor of refuge for light draft vessels, protected by breakwaters sheltering an area of about 6 acres with depths of 8 feet.

At Port Sanilac, the United States has constructed a harbor of refuge for light draft vessels, protected by breakwaters and with an available depth of 10 to 5 feet.

At Harbor Beach, the United States has constructed a harbor of refuge suitable for large vessels, formed by breakwaters sheltering an area of 650 acres, in about 90 acres of which there are depths of 11 to 21 feet.

At Port Austin. the United States has constructed a harbor of refuge for light draft vessels, protected by a breakwater and with an available depth of 10 to 6 feet.

Piers of steel sheet piling have been constructed by the United States at the mouth of the Au Sable River, near Oscoda. The harbor accommodates shallow draft vessels, only, and the entrance channel requires frequent dredging.

At Harrisville, the United States has constructed breakwaters with available depths of 12 to 10 feet inside to form a harbor of refuge for light draft vessels.

About three miles northwest of Hammond Bay, the United States had constructed a harbor of refuge for light-draft vesels by semi-inclosing an area of Lake Huron with breakwaters. In 1965 there was a depth of 10 feet throughout the area.

At Mackinaw City, the United States has constructed a breakwater which provides a harbor of refuge for light draft vessels. The available depth in the harbor is 5 to 10 feet.

Improvements by the United States also comprise the dredging of channels to a depth of 27 feet in Saginaw Bay and River leading to Bay City and thence 22 feet to Saginaw; to a depth of 18½ feet in the Thunder Bay River at Alpena, and to a depth of 18½ feet in the Cheboygan River at Cheboygan. Periodic dredging is required to maintain these channels.

Between Fort Gratiot at the south end of the lake and Pointe aux Barques at the entrance to Saginaw Bay, various private piers and wharves have been built out from the shore to enable small craft to land in favorable weather; but some of these are in poor condition. Within this reach the lake bottom is composed of rocks and boulders.

The course across the mouth of Saginaw Bay from Pointe aux Barques to Au Sable is dangerous in heavy weather. Entering this bay, the deepest water is found between Charity Island and Point Lookout on the west shore. The water level in Saginaw Bay is subject to sudden changes due to the wind, a northeast gale driving the water into the bay so as to raise the level at the mouth of the Saginaw River 3 to 4 feet sometimes in less than as many hours, while a southwest wind lowers the level in the entrance channel and sometimes causes deeply laden vessels to ground on the bar. Tawas Bay, affording secure anchorage in 21 to 24 feet at its head and exposed only to southwest winds, is a natural harbor of refuge for vessels which are caught by heavy weather at the entrance to Saginaw Bay.

Another natural harbor of refuge is near Alpena, in Thunder Bay, which is 78 square miles in area. This bay gives shelter in all but southeasterly gales and good holding ground is found generally under the shores. The north shore from Whitefish Point to North Point affords a good lee in heavy northeast gales in depths of 24 to 30 feet close to shore, with clay and sand bottom.

Going farther north, False Presque Isle Harbor, 4½ miles northwesterly from Middle Island affords protection for vessels from northerly and westerly winds; the area is small with fair holding ground. There are also two small harbors at Presque Isle, known as Presque Isle Harbor and North Bay, located southeast and west of Presque Isle, respectively; the former should not be entered by vessels drawing more than 12 feet. Cheboygan Harbor entrance is well sheltered, being located on the south shore of the South Channel of the Straits of Mackinac. west of Duncan (McLeod) Bay.

DETAILED DESCRIPTIONS OF COAST LINE, HARBORS, ISLANDS, AND REEFS

Section I.—West Shore From Head of St. Clair River to Pointe Aux Barques, Mich.

Charts 14862, 14865.—The south end of the lake, in the approach to the head of St. Clair River, is obstructed by a shallow area through which it has been necessary to dredge a ship channel for the benefit of navigation by large vessels.

In 1977, the channel had a controlling depth of 30 feet. Depths over the shoal area along the sides of the improved channel are about 17 feet. Shoals lying to the eastward of the channel are described below.

The improved channel from just above Fort Gratiot Light is on the Point Edward range of 180½°-000½° for about 3½ miles, then turning for about 2¼ miles on 005° to approximately 5¾ miles 005° from Fort Gratiot Light which is the point of departure for the upper lake ports.

Aids to Navigation.—Fort Gratiot Light is 82 feet above the lake on a white conical tower located on the mainland to the west of the entrance from Lake Huron into the St. Clair River. A radiobeacon is near the light.

The south end of the dredged channel is marked by a buoy on the east edge 2,300 feet 062½° from Fort Gratiot Light, and by a buoy on the west edge 1,650 feet 049½° from the light. The channel northerly to deep water is well marked with buoys on the east and the west edges.

Point Edward range is located on the Canadian shore at the head of the St. Clair River. The front light, 35 feet above the lake on a cylindrical concrete tower, is on the beach. The rear light is on the Blue Water Bridge, 120 feet above the lake and 2,400 feet 180°20′ from the front light. This range should be followed to or from its intersection with the Fort Gratiot range lights in Port Huron on the St. Clair River.

Coast Guard Station.—Port Huron Coast Guard Station is located on the west side of the entrance to the St. Clair River, near Fort Gratiot Light.

National Weather Service Warning Display Station.—Signals are displayed from a flagstaff at the Port Huron (Fort Gratiot) Coast Guard Station.

From the lake shore north of Point Edward, spoil from dredging operations was dumped in a shallow area extending 3 miles northward, adjacent to and within a distance of about 1 mile to eastward of the improved channel, leaving numerous mounds with limiting depths of 6 to 12 feet.

Wrecks.—Some wreckage with a least depth of 15 feet over it and 26 feet of water surrounding, was located in 1914 about 1½ miles east of the ship channel at a point 3.41 miles 034° from Fort Gratiot Light.

Two old wrecks lie northerly of Point Edward approximately 3,800 feet 095° from Fort Gratiot Light.

Black River Canal.—This canal extends from Lake Huron at a point about 1½ miles north of Fort Gratiot Light, in a southwesterly direction for a distance of approximately 1¼ miles to about mile 4.5 on the Black River. Flow from the lake through the canal is controlled by a taintor gate at the lake end which is closed during strong northeast winds. In November 1977, it was reported that depths in the canal are variable, but that 2 to 4 feet may, at times, be carried through the canal. Shoaling at the lakeward mouth occasionally restricts passage through the canal. Vertical clearances across the canal are reported to be about 8 feet.

Chart 14862.—The coast in the 30 miles from Fort Gratiot Light to Port Sanilac has no large projections and trends from northwest to north. The first 19 miles to the vicinity of Lexington is low and the remainder has low shore bluffs and rocky lake shore bottom. In this stretch, the offshore holding ground is generally good. Clay bottom is found off Lexington and north, in depths of 24 to 30 feet.

A shoal bank with depths of 9 to 15 feet extends from Fort Gratiot Light 3 miles northward along the west side of the improved channel, where the offshore reach is about 1½ miles. Thence to Lexington, depths of 18 feet or less are found up to 1¼ miles offshore. There is a rocky shoal with a depth of 12 to 15 feet ¾ to 1 mile northeast of the mouth of **Burtch Creek**, 12 miles north of Fort Gratiot Light. A sandy shoal with 20 feet of water over it and 27 feet surrounding lies 2¼ miles east of the shore at **Mill Creek**, about 3 miles south of Lexington.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A 16-foot diameter potable water intake tunnel of the City of Detroit, Mich., dedicated 13 Dec. 1973, commences at a point on the shoreline 1,640 feet 158° from the triangulation point just off Metcalf Rd. approximately two miles south of Lakeport. The tunnel extends 26,090 feet 052°36′ to an intake crib in 46 feet of water. There is a depth of 40 feet over the intake crib and it is not marked.

Lexington, Mich. is an artificial harbor 19½ miles north of the Blue Water Bridge at Port Huron. An elevated silver water tank in Lexington is readily visible from lakeward and makes a good landmark.

Channels.—A dredged entrance channel leads northward from deep water in Lake Huron to a harbor basin formed by two breakwaters. In 1977, the controlling depths were 9 feet in the entrance channel and 7 feet in the basin.

Aids to Navigation.—The harbor entrance is marked by buoys and by two lights, one on the east breakwater and one on the west breakwater.

Harbor facilities.—In 1977, no dockside services were available.

From Lexington to Port Sanilac there are scattered rocks and patches of rocks extending from ¼ to ½ mile offshore forming a hazard for small craft. The most dangerous, a detached rock shoal, awash during periods of low water, is about ½ mile offshore and 5 miles south of Port Sanilac Harbor.

Wrecks.—The steamer **Chas. S. Price**, carrying a cargo of coal, overturned and sank during the gale of November 9–10, 1913. It is located approximately 10½ miles 018° from Fort Gratiot Light. Examination in 1914 showed 29 feet of water over the highest part of the hull bottom.

The steamer **Eliza Strong** was sunk in Lake Huron October 25, 1904, about 4,400 feet southeasterly of the foot of Huron Street in Lexington. The upper portions of the wreck were later blasted away, and soundings in 1914 showed nothing less than 13 feet over the highest part of the remains, with more than 22 feet of water surrounding.

Port Sanilac, Mich.—This artificial harbor is located on the west shore of Lake Huron about 30 miles north of Port Huron at the Village of Port Sanilac. The harbor is used by pleasure craft. An elevated blue tank just north of the harbor is prominent from lakeward and makes a good landmark.

Channels.—A dredged entrance channel extends northward from deep water in Lake Huron on the west side of an extension of the north breakwater which protects the harbor entrance. The channel turns westward between the north breakwater and a detached south breakwater into the harbor basin. In 1977, the controlling depths were 9 feet in the entrance channel, thence 9 to 5 feet in the easterly section of the northerly anchorage area with 3 feet at the docks, thence 4 to 5 feet in the easterly section of the southerly anchorage area with 3 feet at the dock and 2 feet in the southwesterly section.

Aids to Navigation.—Port Sanilac North Breakwater Light, on a steel pole 31 feet above the water, is located on the south end of the north breakwater. The South Breakwater Light, on a steel pole 29 feet above the water, is

located on the north end of the south breakwater. Port Sanilac Light, located 69 feet above the lake on a white octagonal tower, is about 200 feet from the waters edge due west of the inner end of the south breakwater.

Harbor Facilities.—A public dock, located opposite the harbor entrance, extends easterly about 180 feet from shore, to the project anchorage area and with a north arm 175 feet long with a 62-foot easterly arm at the north end, and a south arm 250 feet long, fronts along 425 feet of that area to provide facilities for small craft. In 1972, there was 5 feet of water along the east side and 4 feet along the south and west side of the south arm.

Gasoline, diesel fuel, water, restrooms, showers, lights, sewage pump-out facilities, electricity and harbormaster services are available at the public dock. Restaurants, stores and motels are found nearby in the village.

A marina southward of the public dock provides gasoline, water, ice, electricity, marine supplies, a surfaced launching ramp, a 20-ton hoist, and hull, engine, and electronic repairs.

National Weather Service Warning Display.—Signals are displayed from a flagstaff on the shore opposite the harbor entrance.

Above Port Sanilac the character of the coast continues bluff and rocky, with a northerly trend for 29 miles to Harbor Beach. Outlying rocks, submerged and exposed, form a hazard to small craft traversing this coast and while it is impractical to describe all of these hazards, the most dangerous are described below. One mile north of Port Sanilac and ⅓ mile off shore, there is a spot with rocks awash. About 11½ miles above Port Sanilac and ½ mile off Indian Creek in a northeasterly direction, there are rocks with 3 to 6 feet depth, ½ mile from shore. Forester and Forestville, respectively, are about 5 miles and 16½ miles north of Port Sanilac.

Forester, Mich., can be identified by the spires of 2 small white churches close to shore. There are no docks and shoal water, rocks and the ruins of former docks, render navigation hazardous. Landings should not be attempted by strangers.

Forestville, Mich. can be identified by the spire of a small white church. A rough rock jetty has also been constructed extending about 200 feet from shore with a small boat launching ramp near its north side. Excellent holding ground is found in 30 feet of water southeast of the jetty. Above White Rock Point, 9 miles south of Harbor Beach, there are rocks and rocky spots extending ⅓ to ¾ mile offshore, and this character continues 3¾ miles northerly to Buckley Creek. From Buckley Creek to Harbor Beach, the rocky shallow area extends about ¼ mile offshore.

Harbor Beach, Mich.—This artificial harbor is located about 60 miles north of Port Huron, which is at the head of the St. Clair River, and affords the only safe large vessel refuge on the west shore of Lake Huron from Port Huron to Tawas Bay, a distance of about 119 miles. Port Austin, about 28 miles northwesterly from Harbor Beach affords only limited protection for small craft.

Channels.—A dredged entrance channel leads westward between detached breakwaters to a dredged anchorage basin inside the north breakwater. In 1976, the controlling depth was 20 feet in the entrance channel decreasing to 19 feet at the inner end with 13 feet in the basin except for shoaling to 9 feet along the northwest and southwest limits.

The north entrance gap had a depth of about 7 feet in the easterly half and 5 feet in the westerly half in September 1966.

The south end of the harbor is not closed, and if care is taken to avoid rocks and a wreck, is accessible by small craft of about 3 feet draft.

Aids to Navigation.—Harbor Beach Light is 54 feet above the lake on a white conical tower just within the northerly side of the main entrance; a radiobeacon is operated at this station. South Pier Light, on the south side of the entrance, is 27 feet above the lake on a white skeleton tower.

Two buoys mark the southwest side of the anchorage area, one buoy marks the northwest side, and three privately maintained spar buoys mark the approach channel to the coal dock.

Harbor Facilities.—A public dock about 850 feet long, of steel pile and timber construction, located in the southerly portion of the harbor about 1,500 feet south of the coal dock is in reasonably good condition. Harbor facilities in 1977 included a small boat ramp located north of the public dock, and a marina located just south of the Coast Guard causeway, which had reported depths of 4 feet in the approach channel and 2½ feet alongside in 1977. The marina provides gasoline, diesel fuel, water, electricity, marine supplies, a surfaced launching ramp, and outboard motor repairs. There is a hospital in Harbor Beach about 1,500 feet northwest of the shore end of the public dock. No services other than dockage along the seawall are available to large vessels in Harbor Beach.

The Hercules Inc. coal dock is located opposite the main entrance. Soundings in Jun 1973 in the approach channel to the coal dock showed depths of 16 feet at the harbor basin. In September 1977, the reported controlling depths were 9½ feet along the southeasterly face of the dock with 8 feet along the north and south sides.

The Detroit Edison Co. Harbor Beach Power Plant (dedicated 20 May 1968) is on a 16 acre section of a 95 acre site located inside the breakwater and just north of the Coast Guard Station. The harbor area adjacent to the mooring dolphins east of the easterly dock face and extending further easterly to the west and north channel edges of the harbor of refuge was dredged to 18 feet in 1966. Prominent landmarks, of the power plant, include a stack 300 feet high on the east side of the power plant building which is 150 feet high.

Coast Guard Station.—Harbor Beach Coast Guard Station, seasonally operated, is at the outer end of a causeway and trestle extending east from shore about 0.7 mile west-northwest of Harbor Beach Light.

Submarine Cables.—A submarine cable extends from the Coast Guard Station northeast to the breakwater crossing the harbor just northwest of the anchorage basin, thence southeast along the inner side of the breakwater to the Harbor Beach Light.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The potable water intake pipeline for Harbor Beach commences from a point on shore 6,200 feet 307° from Harbor Beach Light and extends 2,500 feet 058° to a crib with 8 feet over. It is not marked.

Wrecks.—The wreck of a 50-foot fish tug, with depth of only 6 feet over it, lies about 1,050 feet northerly from the end of the Hercules Inc., coal dock; it is outside of the dredged harbor basin and is not marked.

A wreck with 3 feet least depth over it lies 750 feet south of the south corner of the Hercules Inc., coal dock and is not marked.

A wreck with 5 feet of water reported over it lies 725 feet 158° from the south end of the south breakwater.

Navigation Regulations.—See 33 C.F.R. § 207.480 of Rules and Regulations, preceding.

From Harbor Beach to Pointe aux Barques Light, a distance of about 15 miles, the shore trends north northwest, is generally low and wooded with bluffs varying from close up to a mile back from shore and is characterized by an extensive flat with shoal rock ledges and numerous detached rocks submerged and awash extending in some places to 1½ miles offshore. Off **Forest Bay**, from 2 to 3 miles northerly from Harbor Beach, there are several dangerous ledges with depths of 2 to 10 feet, running north and south, 1 to 1½ miles from shore. From Forest Bay to near Pointe aux Barques Light boulders and rocky spots are found within 1 mile from shore with an increased extent in the vicinity of the lighthouse. From Pointe aux Barques Light, a dangerous reef with a depth of 2 feet near its outer end extends easterly 2 miles. A 5-foot spot lies 1¼ miles northeasterly, and boulders with 13 to 15 feet of water over them lie from 1½ miles to over 2 miles in a northeasterly and northerly direction from the light.

Port Hope, Mich., a small village about 7 miles north of Harbor Beach, has a dock in very poor condition and a small basin formed by rubble mound walls. There is less than 2 feet of water in the basin and over the approaches to the basin and dock. A marina, with 1 foot reported alongside in 1977, is just south of the basin and provides water. Good holding ground is found east and north of Port Hope, in depths of 35 to 40 feet. **Port Hope Chimney**, a freestanding stone and brick stack on the beach, is a State monument. This stack and the spire in the village form good landmarks.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. At Port Hope, a potable water intake crib is located about 400 feet easterly of the outer end of the southerly wall of the basin approach channel. The crib is in 6 feet of water with 3 feet over it and is not marked.

Pointe aux Barques Light, 93 feet above the lake on a white conical tower with attached dwelling, is about 15 miles from Harbor Beach and 75 miles northward of Fort Gratiot Light; it marks the turning point to Saginaw Bay.

A buoy is moored in 36 feet of water about 2¼ miles 056° from the Pointe aux Barques Light to mark the limits of the rocky reef extending offshore.

Chart 14863.—From Pointe aux Barques Light to **Pointe aux Barques**, 9 miles northwesterly, the shore line continues relatively low and wooded; ledges and detached rocky spots render the coast dangerous within 3 miles from shore. **Orion Rock**, with 3 feet of water over it, lies about ¾ mile off the shore about 3 miles northwest of Pointe aux Barques Light. A rocky ledge extends out ¾ mile to 1 mile from shore around **Burnt Cabin Point**, the northernmost point of the Thumb and about 2 miles east of Pointe aux Barques, but there is good water in a northeasterly direction ¼ mile off Pointe aux Barques, between the Burnt Cabin Point ledge and Port Austin Reef.

Port Austin Reef reaches northwest 1¾ miles from Pointe aux Barques and extends beyond Port Austin Reef Light. Northwesterly ⅞ mile from this light, there is a reef with a depth of but 11 feet, running in an east-and-west direction for nearly ¼ mile. The reef is marked on the north by a buoy in 35 feet of water and vessels should not pass inside the buoy. From Pointe aux Barques to Port Austin, Mich., the shore line extends to the southwest and the rocky flat extends over ½ mile offshore.

Grindstone City, Mich., a small settlement about 5½ miles northwesterly from Pointe aux Barques Light, has a small harbor formed between two jetties. The harbor is exposed to winds from the north to east. The first, an irregular shaped jetty of stone and earth, extends about 1,500 feet northeast from shore and affords protection from north to northwest winds. The second jetty, about 1,000 feet long, is located about 500 feet southeast and parallel to the first jetty. About 1,200 feet southwest of the outer end of the first jetty, a projection extends about 300 feet to the southeast toward a similar projection to the northwest from the other jetty. This leaves an entrance about 90 feet wide leading to a roughly oval inner basin about 500 feet by 700 feet. Dredging by private interests has provided a channel about 90 feet wide which follows close along a revetment on the northwest side of the southwest jetty for about 300 feet before angling to the west to the entrance of the basin. In September 1977, the reported controlling depth was 4 feet in the approach, channel, and basin. However, it was reported that sudden atmospheric pressure or wind changes may change the water level in the harbor as much as 1 foot. The harbor is used by pleasure craft that tie up in the basin and along the northwest side of the pier, and by boat liveries along the basin. Gasoline is available at dockside pumps. Use of the harbor by persons unfamiliar with the area is not recommended.

Alaska Bay, Mich., at the easterly side of Pointe aux Barques, is a small indentation, protected on the west by Port Austin Reef, and on the east by the rocky shoals off Burnt Cabin Point. A summer resort called Pointe aux Barques is located on the south and west shores of this bay.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The potable water intake for

Pointe aux Barques is located about 200 feet off the end of the dock ruins projecting from the east side of the Pointe aux Barques.

Port Austin Reef Light, 76 feet above the lake, is on a square buff tower with house attached, near the outer end of Port Austin Reef. Rip-rap and other obstructions extend 900 feet horizontally out from the light base and should not be passed close aboard even by vessels of shallow draft. The buoy which marks the detached 11-foot reef is about 1 mile 333° from the light.

Port Austin, Mich.—A small boat harbor, largely artificial, has been constructed at the village of Port Austin which is situated at the mouth of Bird Creek about 2 miles southwest of Pointe aux Barques on the shore of a shallow bay about 3½ miles across between that point and Flat Rock Point. A church spire just east of town and a radio mast on high ground south of the harbor are prominent landmarks in the vicinity and are of assistance in approaching the harbor.

Channels.—A dredge entrance channel leads southward from deep water in Lake Huron to a harbor basin protected by a detached breakwater on the west and northwest sides. In 1976, the controlling depth was 11 feet in the entrance channel with 8 feet in the basin except for shoaling to 7 feet or less in the south end.

The entrance should be approached from the north or northwest to avoid the reef area to the northeast of the harbor. The area around the shoreward end of the breakwater is extremely shoal with numerous rocks and gravel bars above and below the water surface. The harbor affords limited protection from all winds.

Aids to Navigation.—Port Austin Breakwater Light 4, 20 feet above the lake on a white pile, marks the northeast end of the breakwater. A buoy in about 12 feet of water, 2,100 feet 001° from the Port Austin Breakwater Light 4, marks the northwest edge of the shoal area east of the entrance and the east side of the approach channel. Another buoy marks the east side of the entrance and buoys mark the west side and southeast corner of the federally dredged project. A series of buoys has also been established in the small boat anchorage area west of the mouth of Bird Creek by the Mich. Dept. of Nat. Res.

Harbor Facilities.—A steel and concrete pier is located at the west side of the creek mouth, and extends in a northerly direction about 600 feet, and northeasterly another 100 feet to its outer end.

In 1963, another dock was constructed extending from the shore parallel to the pier. Mooring under the control of a Harbor Master employed by the Michigan Waterways Commission is possible along the easterly face of the pier in boat wells which extend perpendicular to the west side of the pier and in wells along a parallel pier of steel pile and timber construction located about 250 feet westerly of the creek mouth and extending about 400 feet from shore. Water, electricity, lights, gasoline, sewage pump-out facilities, restrooms and showers are available at this facility.

The basin outside the dredged area is generally shoal and rocky except for an area in the vicinity of the piers which was dredged to a depth of 6 feet by the Michigan Waterways Commission. Much of this area was dredged from solid rock leaving an abrupt shoal border along its limits which although marked with private aids to navigation, is hazardous. The southerly limit, which runs perpendicular to the piers is just inshore of the wells; the westerly limit parallels the piers and is about 120 feet west of the centerline of the west pier; the northwest limit, about parallel to the outer arm of the breakwater, joins the west limit about 150 feet northwest of the outer end of the westerly pier.

Investigation by the Michigan State Waterways Commission at Port Austin in June, 1972 indicated shoaling had developed along the east side of the mouth of Bird Creek. The shoal generally is adjacent to the east side of the creek from the visible outer end and extending upstream to about the first turn. Approximately 5 feet of water is generally available for a width of about 25 feet along the westerly edge of the creek from the Federal project area to the radio masts area.

Most marine repair facilities are available at various marinas in Bird Creek. Stores, restaurants and motels are nearby.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake of the village of Port Austin is located just westerly of the detached breakwater. The pipeline commences on the shoreline 3,325 feet 285° from the spire east of Bird Creek and extends 525 feet 343°, thence 900 feet 016°, thence 700 feet 034° to an intake crib in 10 feet of water. There is a depth of 9 feet over the crib and it is not marked.

Section II.—Saginaw Bay, From Pointe Aux Barques to Au Sable Point, Mich.

Chart 14863.—Saginaw Bay, the largest indentation along the west shore of Lake Huron, has a width of 26 miles at its entrance between Pointe aux Barques to the southeast and Au Sable Point to the northwest, and the distance from this line southwesterly to the head of the bay at the Saginaw River is 51 miles. Its minimum width is 13 miles between Sand Point on the southeast and Point Lookout on the northwest. Sand Point is about 25 miles southwest of Pointe aux Barques and Point Lookout is about 23 miles southwest of Au Sable Point. The only outlying islands in the bay are Charity and Little Charity Islands.

Owing to the very shallow bank extending from the easterly shore to beyond the Charity Islands, and to the shoal projecting from Point Lookout, the deep channel at this point of least width is contracted to a width of about 1¾ miles. The inner portion of the bay has a width of up to 22 miles and depths of more than 24 feet are found in a channel up to 7 miles wide which extends from Point Lookout to within 8 miles of the mouth of the Saginaw River. A maintained channel leads from this point through the bay and up the Saginaw River to Bay City and Saginaw.

Caution.—The water level in Saginaw Bay is subject to sudden changes due to the wind, a northeast gale driving

the water into the bay so as to raise the level at the mouth of Saginaw River 3 to 4 feet sometimes in less than as many hours, while a southwest wind lowers the level at times sufficiently to cause large vessels to ground in the channel.

The general trend of the reach of about 22 miles from Port Austin to Sand Point is southwesterly. For 1½ miles from Port Austin Harbor to Flat Rock Point the trend of the shoreline is westerly. It then turns southwesterly for 3 miles to the mouth of the **Pinnebog River.** From that river for 10½ miles to the tip of **Oak Point** the trend is again westerly and is regular except for **Hat Point,** a prominence in the shore line about 3 miles west of the river. From Oak Point, the shore line extends southerly to Caseville Harbor at the mouth of the Pigeon River. Between Caseville and the inner end of Sand Point, a reach of 3 miles, the trend is southwesterly. Sand Point extends about 4 miles to the west and has a width varying from 1 mile at its inner end to less than ¼ mile near its outer end. **Charity Island,** roughly triangular with sides about a mile long, is located about 8 miles north of the west end of Sand Point and 9 miles northwest of Oak Point. An abandoned lighthouse is located on the northwest tip of the island. **Little Charity Island,** about 2 miles southwest of Charity Island, is about ½ mile long east-west.

Westerly from Flat Rock Point, **Flat Rock Point Reef,** detached and having depths of but 2 to 5 feet, lies with its south end about 2 miles north of the mouth of Pinnebog River and runs thence about 1 mile northerly. South of the reef, in the bay northwest of Pinnebog River, there is good water. **Hat Point Reef,** with depths of 2 to 6 feet near its end, extends north about 2 miles from shore near Hat Point, 8½ miles from Pointe aux Barques. A detached shoal with 20 feet least water is located 3.9 miles northwesterly from Flat Rock Point and 4 miles northerly from Hat Point. A detached 21-foot spot lies 5¼ miles northwesterly from Hat Point.

About halfway between Hat Point and Oak Point, 7½ miles distant, a rocky shoal extends 2 miles from shore, with depths of 10 feet at 1¼ miles out and a spot with 1 foot ⅞ mile from shore. A 12-foot spot, with about 35 feet surrounding, lies 2 miles northwesterly from Oak Point.

From Sand Point, a shoal area extends in a northwesterly direction for 12 miles, surrounding the Charity Islands. Between the point and the islands the shoal is of sandy formation, with some scattered boulders, the maximum available depth across it being about 7 feet, and the prevailing depths less. The surrounding flats extend from Charity Island 3 miles on the east and west sides, and to northwestward 4½ miles, where, off the outer edge, is moored a buoy bearing northwesterly 5.6 miles from the northwest point of the island. Entering Saginaw Bay, a course southerly from the buoy leads 6½ miles through deep water to abreast of Gravelly Shoal Light, and thence a course southwesterly leads 24 miles to the entrance channel of Saginaw River, at the head of the bay.

A number of shoal spots, of rocky formation and very small extent, rise abruptly from depths of 24 to 36 feet beyond the shoal bank extending from Charity Island. The shoal most important as to location is a 17-foot spot marked by a lighted buoy about 3.6 miles west-northwestward of Charity Island and close eastward of the course between Gravelly Shoal Light and Charity Island Shoal Lighted Bell Buoy 5. Numerous other spots with depths ranging from 13 to 20 feet lie within the quadrant between bearings north and east from Charity Island, and at distances ranging from 3 to 5½ miles.

Caseville Harbor, Michigan.—This harbor at the mouth of the Pigeon River, about 16 miles southwest of Port Austin Harbor, was completed in 1964 to provide another harbor of refuge from the treacherous waters of Saginaw Bay. It was previously maintained by local interests and used as a base for pleasure boating and fishing.

Channels.—A dredged entrance channel leads from deep water in Saginaw Bay to the mouth of Pigeon River and thence upstream for 0.3 mile. A breakwater extends bayward from the mouth of the river on the north side of the entrance channel. In May 1978, the controlling depth was 3 feet in the northeast half of the channel.

Harbor Facilities.—The Township of Caseville and Michigan State Waterways Commission have also constructed a public dock which provides water, electricity, sewage pump-out facilities, lights, gasoline, and restroom facilities. A public launching ramp is also available.

Aids to Navigation.—Caseville Harbor Breakwater Light, mounted 25 feet above the water on a white pole, is located on the outer end of the breakwater. Unlighted buoys mark the entrance channel in the bay.

A private range, maintained by the village of Caseville, consists of a front range light 2,150 feet 116° from Caseville Harbor Breakwater Light and a rear light 330 feet 113½° from the front range light.

Sand Point.—Canals and approach channels have been dredged at the west end and at three locations on the south side of the point. Some dockage is available on the canals. Care should be exercised in entering as the channels are subject to shoaling.

From the inner end of Sand Point to the mouth of the **Quanicassee River,** a reach of 28 miles, the overall trend of the shore line, which is mostly low and marshy, is southwest. The Quanicassee is at the most southerly point of Saginaw Bay and along the 10 mile reach from this point to the mouth of Saginaw River, the shore line extends northwest.

Wild Fowl Point is 4 miles southwest of the inner end, and **North Island** about 2 miles southerly of the outer end of Sand Point. Wild Fowl Bay is formed under Sand Point and northeast of North Island. Bay Port fronts on the bay immediately east of Wild Fowl Point. Between that point and Fish Point, which is about 11 miles southwest, several islands lie a short distance offshore. The largest of these are **Heisterman (formerly Stony) Island,** 2½ miles west of Wild Fowl Point and a mile south of North Island, and **Middle Grounds Island** and **Maisou Island (formerly Katechay Island),** 2 miles southwest of Wild Fowl Point and just south of Heisterman (formerly Stony) Island. **Sebewaing Harbor,** at the mouth of the

Sebewaing River, is 3 miles northeast of Fish Point. Two stacks, of which the northerly tall, concrete, sugar mill stack is the most prominent, are located in the village of Sebewaing north of the harbor entrance.

Along the 12 miles of shore line from Fish Point to the mouth of the Quanicassee River, there are no prominent natural features or landmarks. Westward to the Saginaw River, the most prominent landmarks are two stacks at the mouth of the Saginaw River and a TV mast at Essexville.

Southwesterly from the shoal area connecting Sand Point and the Charity Islands, the entire easterly shore is filled by a sandy flat extending off from 8 to 10 miles within the 18-foot contour. The bottom on this flat is somewhat irregular, depths of 10 feet or less being scattered well over the entire area.

Wild Fowl Bay has depths of 6 feet or more outside a very shoal border about ½ mile wide along its northerly shore and about a mile wide along its easterly shore. Its southerly side is also shoal inside the line of the northeast side of North Island.

About one mile northeast of Bay Port is the channel known locally as Wallace Stone Cut. It is 40 feet wide, marked with pilings on either side, and leads into a small boat facility. In 1977, the entrance channel had a reported controlling depth of 5 feet with 4 to 10 feet in the basin.

Bay Port Harbor, Michigan.—This harbor is on the southerly shore of Wild Fowl Bay which is located on the east shore of Saginaw Bay. Wild Fowl Bay is a low and marshy area about 10 miles southwesterly from Caseville Harbor and about 30 miles northeasterly from the mouth of the Saginaw River. A channel from deep water in Wild Fowl Bay to the local fish wharves was previously maintained by local interests with the dredging spoil deposited along the east side of the channel.

Channels.—A dredged entrance channel leads southward from deep water in Saginaw Bay to join privately maintained channels. In 1974, the controlling depth was 3½ feet in the entrance channel.

Aids to Navigation.—The dredged channel is marked with buoys on either side.

Depths of less than 6 feet are found in the 3½ mile wide shoal border between Wild Fowl Point and Fish Point. The outer limit of this border extends from the northwesterly tip of North Island to about a mile northwest of Fish Point.

Sebewaing Harbor, Mich.—This harbor is at the mouth of the Sebewaing River, on the east shore of Saginaw Bay about 12 miles southerly of Sand Point and 20 miles northeasterly from the mouth of the Saginaw River. In its original condition the river below Sebewaing had a crooked, shallow channel, with an available depth of about 4 feet. To remedy this condition, a cut-off on a direct line to the bay was dredged by private enterprise from a point about ½ mile above the original mouth where a fish house stands. This cut-off channel was subsequently improved by the United States.

A pile dam 150 feet long, covered with dredged material, was built in 1905 across the old river bed. A dike extends about 1¼ miles out from the river mouth along the northerly side of the entrance channel. In connection with flood control, steel and concrete revetments have been constructed along critical sections of the river banks.

Channels.—A dredged entrance channel leads southeastward from deep water in Lake Huron through the mouth of the Sebewaing River and upstream to about 800 feet below the Chesapeake and Ohio Railroad bridge. Above this point a channel dredged for flood control purposes extends upstream for about another 1.3 miles to the junction of the Columbia and State Drains.

In February 1978, the controlling depth was 1 foot on the centerline in the entrance channel, thence in 1969-February 1978, 1½ feet in the flood control project.

Aids to Navigation.—The dredged channel is marked with a number of buoys on either channel edge leading into Sebewaing Harbor.

Bridge.—The Chesapeake and Ohio Railway bridge crosses the river 800 feet east of the front range target. It is a fixed girder bridge with span openings of 28, 30 and 75 feet, left, center, and right, respectively, looking upstream, and a vertical clearance of 12 feet. The bridge is not lighted.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceeding. Regulation No. 32, Huron county. R 281.732.1. Sebewaing river and channels and canals; slow—no wake speed.

1. On the waters of the Sebewaing river and connecting natural and artificial channels and canals, sections 7 and 8, town 15 north, range 9 east, Sebewaing village, Huron county, from the M-25 (Beck street) bridge downstream to the mouth. * * *

From Fish Point to the Quanicassee River, the shoal border inside the 6-foot contour is generally less than a mile wide. Two privately maintained cuts provide shelter in the northerly part of this reach and local interests have established lighted ranges to mark the approach channels.

The northerly, Thomas Cut, 6½ miles southwesterly of Sebewaing and 3 miles from the northerly tip of Fish Point is a base for commercial fishing and had, in 1962, a controlling depth of 2 feet in the approach channel and 4 feet in the lower ¼ mile of the cut. A ramp and limited dock space were available.

About 8½ miles southwesterly of Sebewaing and 2 miles southerly of Thomas Cut, a private facility had a controlling depth of 3 feet in the approach and 6 feet in the inner basin in 1963. Docks, a hoist and a ramp were available.

The Quanicassee River, entering the southeasterly head of Saginaw Bay, is practically closed by the bars at its mouth. Off the river, depths of less than 6 feet are found up to 2 miles from shore. To the west, the shoal border inside the 6-foot contour widens rapidly to about 5 miles along a spit about half way to the Saginaw River and again narrows to less than a mile near the mouth of that river. However, shoals and islands have been formed

by the deposit of dredged material in dumping grounds extending along the inner 6 miles of the Saginaw River entrance channel.

Charts 14863, 14867—Saginaw River, Mich.—This river is formed by the confluence of the Tittabawassee and Shiawassee Rivers at **Green Point**, at the southerly limits of the city of Saginaw, flows in a northerly direction a distance of 22 miles, and discharges into the south end of Saginaw Bay at **Bay City** and **Essexville**. The river upstream as far as the C & O Ry. bridge (mile 18.04) is primarily a commercial harbor with numerous docks along both sides of the river and facilities for handling coal, oil, stone and other products. The two 500-foot stacks at the powerplants on the east side of the river mouth and a TV mast at Essexville are very prominent landmarks in the approach.

The towns of **Carrollton** and **Zilwaukee** are located on the west bank of Saginaw River just north of Saginaw.

Fluctuation of Water Level.—Each year the normal level in Saginaw River rises and falls about 3 feet, as measured by the highest and lowest monthly mean stages. In addition, spring floods and excessive rains may cause an abnormal rise of as much as 14 feet in the river at Saginaw. Occasionally a considerable change takes place within a few hours, resulting from the raising or lowering of Saginaw Bay by violent northeasterly or southwesterly winds.

In 1977, it was reported that the **Tittabawassee River** was navigable by small boats for only about 1.5 miles above Green Point. Above that point the river is severely obstructed by stumps, sunken logs, and snags.

The **Shiawassee River**, near Green Point, has an available depth of 5 to 6 feet, and the crooked channel across Shiawassee Flats is 15 or 16 feet deep in many places. In 1977, numerous submerged pilings were reported at the mouth of the river in the vicinity of Green Point. Upstream from the flats the Shiawassee River is very narrow and crooked, but is navigable for small boats up to the junction with **Bad River**, and the Bad River up to the village of St. Charles, which is 13 miles from Green Point. A high-

Structures Across the Saginaw River and Tributary

No.	Location and name	Kind	Miles above Saginaw Bay Front Range Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Main Channel								
1	Aerial cable	Electric	0.60	------	------	------	181.9	178.9	Consumers Power Co.
2	do	do	0.90	------	------	------	125.0	122.3	Do.
3	Essexville Turning Basin		2.80	------	------	------	------	------	Approx. depth 25 feet.
4	Submerged cable	Electric	3.09	------	------	------	------	------	Approx. depth 29 feet right draw; 29 feet left draw.
5	Detroit and Mackinac Ry. bridge.	Railroad	3.10	96.0	94.0	------	7.8	3.8	Swing. Both clear. See note 1.
6	Submerged pipeline	Oil	3.18	------	------	------	------	------	Approx. depth 32 feet.
7	do	Outfall sewer.	3.70	------	------	------	------	------	Approx. depth 11½ feet. See note 3.
7A	Independence Bridge	Highway	3.87	------	------	150	30.0	------	Bascule. 22 feet at sides.
8	Submerged cables	Telephone Electric.	3.96	------	------	------	------	------	Approx. depth 30 feet (2 cables).
10	Submerged cable	Telephone Electric.	4.00	------	------	------	------	------	Approx. depth 30 feet. (2 cables).
11	Submerged pipeline	Water	4.01	------	------	------	------	------	Approx. depth 32 feet.
12	do	do	4.85	------	------	------	------	------	Do.
13	Submerged cable	Telegraph	4.95	------	------	------	------	------	Approx. depth 29 feet. Western Union.
14	Grand Trunk Western Railroad bridge.	Railroad	4.97	101.0	101.0	------	8.0	4.0	Swing. Both clear. See note 1.
15	Submerged pipeline	Outfall sewer.	5.12	------	------	------	------	------	Approx. depth 31 feet.

Structures Across the Saginaw River and Tributary—Continued

No.	Location and name	Kind	Miles above Saginaw Bay Front Range Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Main Channel—Con.								
17	Third Street bridge	Highway	5.26	78.0	77.0	------	18.0	14.0	Swing. Both clear. Being removed 1977.
17A	Submerged cable	Electric	5.26	------	------	------	------	------	Approx. depth 30 feet.
18	Submerged cable	Telephone	5.37	------	------	------	------	------	Approx. depth 30 feet (9 cables).
19	Veterans Memorial bridge.	Highway	5.60	------	------	146.5	23.3 (15.0)	19.3 (11.0)	Bascule. (Center of draw. (At edge of draw.)
19A	Submerged cable	Electric	5.60	------	------	------	------	------	Approx. depth 29 feet.
20	Submerged pipeline	Water	5.62	------	------	------	------	------	Approx. depth 26 feet. City of Bay City. (Abandoned.)
21	do	do	5.63	------	------	------	------	------	Approx. depth 32 feet. City of Bay City.
22	Submerged cable	Electric	5.65	------	------	------	------	------	Approx. depth 30 feet.
23	Submerged pipelines	Gas	5.65	------	------	------	------	------	Approx. depth 30 feet. (2-8″ mains). Consumers Power Co.
25	Aerial cable	Electric	5.80	------	------	------	135.0	131.7	Consumers Power Co.
	Main channel—West channel.	Junction	6.29						
26	Lafayette Street bridge	Highway	6.79	------	------	150.0	20.0	16.0	Double-leaf bascule.
27	Submerged cable	Electric	6.80	------	------	------	------	------	Approx. depth 27 feet.
28	Cass Avenue bridge	Highway	7.79	------	------	104.0	------	------	Bridge removed. Piers remain.
30	Submerged pipelines	Gas	8.33	------	------	------	------	------	Approx. depth 30 feet (2 mains).
31	Submerged pipeline	Oil	8.74	------	------	------	------	------	Approx. depth 38 feet (Lakehead Pipeline Co.).
31A	Airport Turning Basin	------	9.00	------	------	------	------	------	Project depth 22 feet.
32	Submerged pipelines	Gas	10.02	------	------	------	------	------	Approx. depth 28½ feet (2 mains).
33	Aerial cable	Electric	10.03	------	------	------	143.9	139.9	Consumers Power Co
33A	do	do	13.05	------	------	------	142.0	137.5	Do.
34	do	do	14.47	------	------	------	138.0	133.3	Do.
35	do	do	14.59	------	------	------	136.0	131.3	Do.
36	Route I-75 bridge (Zilwaukee).	Highway	14.70	------	------	150.0	30.6	26.6	Bascule.
36A	Submerged cable	Electric	14.70	------	------	------	------	------	Approx. depth 28½ feet.
37	Aerial cable	do	14.83	------	------	------	130.0	125.2	Consumers Power Co.
37A	Submerged pipeline	Sewer	15.42	------	------	------	------	------	
38	Submerged pipeline	Outfall Sewer.	15.86	------	------	------	------	------	Approx. depth 27 feet. See note 4.
38A	Carrollton Turning Basin	------	16.82	------	------	------	------	------	Project depth 20 feet.
39	Sixth Avenue bridge	Highway	17.05	72.0	72.0	------	12.0	8.0	Swing. Both clear.
40	Submerged cables	Electric	17.06	------	------	------	------	------	Approx. depths 29 and 34 feet. City of Saginaw.

Structures Across the Saginaw River and Tributary—Continued

No.	Location and name	Kind	Miles above Saginaw Bay Front Range Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Main Channel—Con.								
41	Submerged pipeline	Gas	17.07						Approx. depth 29½ feet. Consumers Power Co.
42	Sixth St. Turning Basin		17.30						Approx. depth 20 feet.
43	Submerged cables	Telephone Telegraph.	18.02						Approx. depth 27 feet (2 cables).
44	Chesapeake and Ohio Ry. bridge.	Railroad	18.04			150.0	13.6	9.6	Bascule, clear.
45	Aerial cable	Electric	18.05				124.0	118.8	Consumers Power Co.
46	Submerged pipeline	Interceptor Sewer.	18.07						Approx. depth 24 feet.
46A	I-675 bridge	Highway	18.40			138.0	34.5	30.5	Mich. St. Hy. Dept.
47	Submerged pipeline	Oil	18.50						Approx. depth 17 feet.
48	Submerged cable	Electric	18.52						Approx. depth 25 feet.
49	Johnson Street bridge	Highway	18.52			90.0	14.5	10.5	Bascule; clear.
50	Submerged cable	Telephone	18.53						Approx. depth 20 feet (abandoned).
51	Submerged cables	do	18.67						Approx. depth 24 feet (abandoned) (3 cables.)
52	do	do	18.68						Approx. depth 19 feet (abandoned) (3 cables).
53	Genesee Avenue bridge	Highway	18.68			88.0	25.0	21.0	Fixed.
54	Submerged cables	Electric	18.69						Approx. depth 21½ feet (2 cables).
55	Submerged pipeline	Water	18.86						Approx. depth 27 feet.
56	Submerged cables	Telephone	18.88						Approx. depth 25 feet (18 cables).
57	Submerged pipeline	Gas	19.02						Approx. depth 27 feet. Consumers Power Co.
57A	Submerged cable		19.14						
58	Grand Trunk Western Railroad bridge.	Railroad	19.15	70.0	70.0		12.4	8.4	Swing. Both clear.
59	Submerged cable		19.17						Approx. depth 20 feet.
60	Holland Street Turning Basin.		19.35						Not maintained.
61	Submerged cable		19.62						Approx. depth 22 feet (abandoned).
62	Aerial cable	Electric	19.66				135.0	129.5	Consumers Power Co.
63	Submerged pipelines	Gas	19.67						Approx. depth 16½ feet (2 mains).
64	Holland bridge	Highway	19.68			113.4	20.5	16.5	Fixed. Opened in 1962.
65	Submerged pipelines	Gas	19.74						Approx. depth 26½ feet.
66	Submerged pipelines	Water	19.74						Approx. depth 20 feet (2 mains).
67	Submerged cables	Electric	19.86						Approx depth. 27 feet (7 cables).
68	Submerged pipeline	Water	19.89						Approx. depth 28½ feet.
69	Turning basin		19.95						Abandoned.

Structures Across the Saginaw River and Tributary—Continued

No.	Location and name	Kind	Miles above Saginaw Bay Front Range Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Main Channel—Con.								
70	Court St. bridge	Highway	20.33			107.5	32.0	28.0	Fixed.
71	Rust Park bridge	do	20.72	66.0	66.0		18.0	14.0	Do.
72	Submerged pipelines	Gas	21.16						Approx. depth 9 feet (3 mains).
73	Aerial cables (2)	Electric	21.31				52.0	46.2	Consumers Power Co.
74	Submerged cable	do	21.32						Approx. depth 23 feet.
75	Center Street bridge	Highway	21.34	74.0	74.0		16.5	12.5	Being removed in 1975.
76	Submerged pipeline	Water	21.35						Approx. depth 26 feet.
76A	Center Street bridge	Highway	21.36			116.0	19.7	15.7	Fixed. Comp. 1975.
77	Aerial cable	Electric	22.30				30.0	24.1	Consumers Power Co.
77A	Aerial cable		22.38				56.3		
	Tittabawassee—Shiawassee Rivers-Green Point. (Upstream limit of Federal improvement.)	Junction	22.50						
	Tittabawassee								
77B	Aerial cable		23.18				30.0		
77C	do		23.20				30.0		
77D	Consumers bridge	Railroad				58.5	25.3		Fixed. Consumers Power Co.
	West Channel								
	North End Main Channel—West Channel.	Junction	6.29						
78	Aerial cable	Electric	6.68				27.0	23.5	City of Bay City.
79	Submerged cables	Telephone	6.68						Approx. depth 6 feet (2 cables).
80	Submerged pipeline	Water	6.69						Approx. depth 6 feet.
81	Lafayette Street bridge	Highway	6.80			71.3	18.0	14.5	Fixed. See note 2.
82	Submerged pipeline	Water	6.82						Approx. depth 7 feet.
83	Aerial cable	Electric	6.83				28.0	24.5	City of Bay City.
84	do	do	7.23				32.0	28.4	Consumers Power Co.
85	Submerged pipeline		7.23						Approx. depth unknown.
86	Aerial cable	Electric	7.78				27.0	23.4	City of Bay City.
87	Cass Avenue bridge	Highway	7.79	73.0	73.0				Swing span removed. Swing pier remains.
87A	Submerged pipeline	Water	7.79						Depth unknown.
88	Aerial cable	Telephone	7.80				27.0	23.4	Michigan Bell Telephone Co.
89	Submerged pipelines	Gas	8.37						Approx. depth 30 feet (2 mains).
	South End West Channel—Main Channel.	Junction	8.44						

Whistle Signal for Opening Draws (see regulations below), 1 long, 1 short (—— —).

Bridges are lighted according to U.S. Coast Guard regulations for lighting bridges.

NOTE 1.—The bridge will not have a tender on duty and will be left in an open position from 3:00 A.M. to 11:00 A.M. Tuesdays through Fridays; and from 3:00 A.M. Saturdays to 11:00 A.M. Mondays except for one special closing usually between 12:00 noon and 4:00 P.M. A bridge tender will be on duty at all other times and proper whistle signals should be sounded to have the bridge opened for passage.

NOTE 2.—At Lafayette Avenue the fixed concrete bridge across the west channel has six spans, the two at center having clear width of 71.33 feet and vertical clearance of 18 feet above low-water datum at middle of spans.

NOTE 3.—Extends from south bank to 35 feet from south channel line.

NOTE 4.—Extends 65 feet riverward of channel line.

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way bridge with a fixed 19-foot span and a clearance of 8.8 feet crosses Shiawassee River about 6.7 miles above the mouth.

The Cass and Flint Rivers, which are tributaries of the Shiawassee, are navigable by rowboats to a limited extent, being greatly obstructed by sunken logs and snags.

Channels.—A Federal project provides for a dredged entrance channel leading southwest from the deep water in Saginaw Bay for about 13.5 miles to the mouth of the Saginaw River and thence upstream for about 20 miles to the ports of Bay City and Saginaw.

The Federal project depths are 27 feet in the entrance channel to the mouth of the river, thence 26 feet through the mouth, thence 25 feet to the Grand Trunk Western Railroad bridge at Bay City, thence 22 feet to the Chesapeake and Ohio Railway bridge in Saginaw, thence 16½ feet to the Holland Avenue bridge in Saginaw. Five turning basins in the river have project depths as follows: 25 feet at Essexville, 22 feet in Bay City opposite the airport, 20 feet at Carrollton, 20 feet just below the Chesapeake and Ohio Railway bridge at Sixth Street in Saginaw, 15 feet between the Grand Trunk Western Railroad bridge and the Holland Avenue bridge at Carroll Street in Saginaw. (See Local Notice to Mariners and latest edition of charts for controlling depths.)

Above the Holland Avenue bridge in Saginaw depths in the river vary from 7 to 15 feet for about 2.8 miles to Green Point.

Old Bay Channel.—The old bay channel extending from the mouth of the river to deep water in the bay on an azimuth of about 003°30′, and used prior to 1962, has been abandoned and the aids removed to the new channel. Soundings completed in 1963 indicated depths of 21 feet but reports in 1969 indicate shoaling to less depth at the inner end of the old channel.

Aids to Navigation.—The outer approach to the dredged channel in Saginaw Bay, from the intersection of the extended channel axis with the course to Point Lookout, is not marked. The dredged channel extending into Saginaw Bay about 14 miles from the mouth of the river, is appropriately marked by buoys. Saginaw Bay Range Lights mark the alignment of the outer channel. The front range light, shown 25 feet above the water on a white pole is at the turn into the river. The rear range light is shown 65 feet above the water on a white skeleton tower located 3,800 feet 211°20′ from the front light.

Essexville Range Lights, on black skeleton towers with white daymarks, mark the alignment of a reach of the dredged channel inside the river mouth; the front light, 32 feet above the water, is located 10,600 feet 164° from Saginaw Bay Front Range Light, and the rear light, 45 feet above the water, is located 1,060 feet 160° from the front light. The river channel between Bay City and Saginaw is marked by buoys.

Harbor Facilities.—Along the Saginaw River are facilities for receiving and shipping a large variety of materials. There are several marinas with fuel, hoists, ramps and dockage and other facilities for small craft.

Port Series.—The report containing detailed information on port and harbor facilities for the Ports on the Saginaw River, Mich., is contained in the **Port Series No. 45** (Revised 1972) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Coast Guard.—Saginaw River Coast Guard Station, having personnel and facilities for life-saving activities, is located on the westerly side of the river at the mouth.

Bridge Regulations.—See **33 U.S.C. 499**, published in Certain Laws, preceding, and **33 C.F.R. § 117.700** published in Rules and Regulations, preceding.

Chart 14863.—From the mouth of the Saginaw River the coast extends northwest about 3 miles to the vicinity of the Bay City Waterworks, thence north-northwest about 7 miles to a low, sandy projection known as **Nayanquing Point**; thence northerly about 11 miles to the mouth of the **Saganing River**; thence northeast about 5 miles to the west side of **Wigwam Bay**; thence easterly about 9 miles to the tip of Point Au Gres; and thence northerly about 4 miles and easterly about 4 miles to the tip of Point Lookout. The shore line in this reach is generally low and marshy and the 18 foot contour extends from 5 miles north of the Saginaw River mouth northwest to 3 miles east of Nayanquing Point and northeast to Point Lookout, passing a mile off Point Au Gres. The flat inside the 18 foot contour is sandy and stony and generally shelving, with depths of 12 feet or less within a mile or less of that contour and depths of less than 7 feet extending over a mile off most of the coast. Off the mouths of some of the rivers in this reach, very shallow spits project well out over the flat.

The Kawkawlin River, entering Saginaw Bay about 2 miles westerly from the mouth of the Saginaw River, is practically closed by the bar at its mouth. However,

dredging during 1955, for purposes of flood control, provided a channel 100 feet wide through the bar to a depth of 6 feet and extended lakeward a distance of 1,800 feet. Soundings completed in June 1969 indicated a controlling depth of 3 feet.

Aids to Navigation.—Buoys mark a channel to the Kawkawlin River, leading northeast out to the 6 foot contour.

The Detroit and Mackinaw RR bridge crosses the Kawkawlin river at mile 0.63. Reconstruction of this bridge was completed in 1970 to provide a vertical clearance of 11 feet and a horizontal clearance of 34 feet in both spans. The fixed highway bridge 1,000 feet southwestward of the railroad bridge has a reported vertical clearance of 10 feet.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceeding. Regulation No. 9, Bay county.

R 281.709.1. Kawkawlin river; slow—no wake speed.

1. On the waters of the Kawkawlin river, section 1, town 14 north, range 4 east; sections 4, 5 and 6, town 14 north, range 5 east; section 36, town 15 north, range 4 east; and section 33, town 15 north, range 5 east, townships of Bangor, Kawkawlin and Monitor, county of Bay, state of Michigan, from the highway bridge at state highway M-13 downstream and 300 feet in any direction from the mouth of the river in Saginaw bay, * * *

R 281.709.2. Artificial canals connected to Kawkawlin river; slow—no wake speed.

2. On the artificial canals connected to the Kawkawlin river in section 5, town 14 north, range 5 east and section 33, town 15 north, range 5 east, township of Bangor, county of Bay, state of Michigan, * * *

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A water-intake crib is located in about 7 feet of water, with 3 feet depth over it, at a point ½ mile offshore about ¾ mile westerly from the mouth of Kawkawlin River and another crib for the Bay City waterworks is located in about 14 feet of water with 11 feet over it at a point about 4 miles northwesterly, of the mouth of the Kawkawlin River. About one mile east of the foot of Pinconning Road, the water intake for Pinconning is located in 4½ feet of water with a least depth of 3½ feet over it.

The Pinconning River is about 5½ miles north of Nayanquing Point. Two elevated water tanks in the village of **Pinconning**, about 2½ miles west of the mouth of the river, are prominent landmarks. Pinconning Bar, extending about 3 miles east from the mouth of the Pinconning River, and **Saganing Bar**, extending about 3 miles east from the mouth of the Saganing River, are very shallow spits with about 2 feet near their outer ends. Off the **Rifle River**, about 3½ miles west of Point Au Gres, Rifle Bar, a shoal area with 1 or 2 feet of water, extends to the southeast 3 miles, with the 18-foot contour about ½ mile farther out. The Rifle River is navigable by canoes for about 10 miles above Omer.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceeding. Regulation No. 6, Arenac county.

R 281.706.2. Pine river; slow—no wake speed.

2. On the waters of the Pine river, from the Highway bridge, in the southeast ¼ of the southeast ¼, section 5, town 18 north, Standish township, Arenac county, downstream and 500 feet in any direction from the mouth of the river in Saginaw bay, * * *

Obstruction.—A submerged obstruction off Point Au Gres lies in 6 feet of water and is marked by a buoy. Mariners are urged to use caution when navigating the area.

Point Au Gres projects from the west shore about 25 miles northerly from the mouth of Saginaw River. The bottom is quite shallow and rocky to 1 mile off around this point, with 30 feet close outside of this limit. In the bight about 6½ miles wide between Point Au Gres and Point Lookout, a sandy and stony flat has a maximum extent of about 2 miles, in the vicinity of the mouth of Au Gres River.

Northwest of Point Au Gres, a small boat shelter and refuge area had a 30-foot wide canal with a reported centerline controlling depth of 4 feet in September 1977. The entrance into the canal from deeper water is between buoys on an approximate northwest bearing to the canal marker and turning into the dock area. Marine facilities including gas, light and water are available.

Point Lookout Harbor, Mich.—This harbor of refuge is located at the mouth of the Au Gres River about 2¾ miles southerly from the city of Au Gres, Mich.

Channels.—A dredged entrance channel leads northwest from deep water in Saginaw Bay between parallel breakwaters to the mouth of the river and thence upstream for about 2 miles to U.S. Route 23 highway bridge. In 1976-March 1978, the controlling depths were 12 feet in the bay channel, thence 10 feet between the jetties, thence 2 feet to the Route 23 bridge.

Aids to Navigation.—Two buoys, located about 1,900 feet southeast of the pier lights, mark the channel at that point leading into the entrance between the piers. Au Gres Harbor North Pier Light 4 is mounted on the southeasterly end of the east breakwater. Au Gres Harbor South Pier Light 3 is mounted on the outer end of the west breakwater about 235 feet westerly of the North Pier Light.

Harbor Facilities.—The Michigan State Waterways Commission has constructed a mooring facility in the city of Au Gres just downstream of the Huron Road (US-23) Bridge. This facility provides moorage for 32 small craft up to 60 feet in length and provides water, electricity, lights, gasoline and oil, restrooms, showers, sewage pump-out facilities and harbor attendant services. The facility is operated by the Waterways Commission.

Aerial Cables.—Two overhead power cables with a minimum clearance of 59 feet cross the river about 2.3 miles above the outer ends of the breakwaters.

Bridge.—The Huron Road (U.S. 23) fixed bridge crosses the Au Gres River about 2.76 miles upstream of the light on the outer end of the east breakwater. The vertical clearance is 8 feet through the span on either side of the midchannel bridge pier and the horizontal clearance is about 15 feet adjacent to the pier at Low Water Datum and ½ foot at high water.

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Slow—No Wake Speed.—See Regulations—State of Michigan, preceeding. Regulation No. 6, Arenac county.

R 281.706.1. Au Gres river; slow—no wake speed.

1. On the waters of the Au Gres river, Sims and Au Gres townships, Arenac county, from the north line of section 13, town 19 north, range 6 east, downstream to the easterly end of the entrance channel pierhead, * * *

At **Point Lookout,** also known as **Gravelly Point,** a shoal with limiting depths of 7 to 18 feet extends southeasterly for 3 miles, and is marked at its outer end by **Gravelly Shoal** Light, 75 feet above the lake on a white square tower with a cylindrical base; a fog signal and marker radiobeacon are at the light. A power cable extends from the light 315° to the shore. This shoel is of importance because it restricts the available deep water between it and the Charity Islands for vessels making the Saginaw River. Vessels should not pass between the light and the point. There is protection from northerly and westerly winds and holding ground in 24 to 30 feet, mud bottom, close under Point Lookout, but this area is obstructed by fish net stakes.

Wreck.—A Coast Guard 40-foot Buoy Boat was sunk in May 1967. The approximate position of the wreck was 2,700 feet 062° from Gravelly Shoal Light. The wreck is not marked.

From Point Lookout to **Tawas Point,** 15 miles northerly, there are hard shoals bordering the shore for a width of from ½ to 1¼ miles, but no detached or outlying obstructions. A 2-foot shoal lies ¾ mile southeast of **Whitestone Point,** 4 miles north of Point Lookout, and 6 miles farther north, shoals with 4 to 7 feet exist about 1 mile offshore at and above Alabaster Dock. The shore line continues low from Point Lookout to Whitestone Point, becomes bluff in the reach to Tawas City and is again low in the reach to Tawas Point.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A water intake extends almost due east offshore from the extremity of Whitestone Point for a distance of about 2 miles, ending at a crib with about 38 feet depth over the top.

Alabaster, Mich.—About 5½ miles southerly from the tank at Tawas City, an aerial tramway and loading dock have been constructed by the United States Gypsum Co. The loading dock is about 6,800 feet from shore in 23 feet of water, on a stone-filled timber-crib foundation about 310 feet long east and west. The tramway from shore to dock consists of a cable supported at 750-foot intervals by eight steel towers on round stone-filled cribs, each 26 feet across. This cable has a minimum vertical clearance of 30 feet. This location is exposed to seas from all directions but west.

Aids to Navigation.—Alabaster Tramway Range Rear Light, 70 feet above the lake, is shown on top of the loading dock, and Alabaster Tramway Range Front Light, 20 feet above the lake, is shown on a crib off the outer end of the dock. The rear light is 170 feet 270° from the front light.

Harbor Facilities.—This is an open roadstead with no facilities except those for loading stone. Because of the danger of falling rock, small craft should stay clear.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline extends easterly for about 300 feet to a crib located north of the U.S. Gypsum Co. dock facilities at Alabaster. It is not marked.

Port Gypsum, Mich.—Located approximately 2½ miles southerly of Tawas City, the National Gypsum Company stone-loading facility consists of a conveyor system extending 1,078 feet from the shore over 7 steel pile inclosed cells leading to a dock. A 200-foot-wide dredged channel, marked by private seasonal buoys, extends from deep water to the 530-foot wide turning basin at the loading area. In September 1977, a controlling depth of 20 feet was available in the channel and basin.

Aids to Navigation.—A private range of lights leads into the channel. The front range light, 46 feet above the lake, is located on a steel tower between cells 6 and 7 near the outer end of the dock, and the rear range light, 78 feet above the lake, is located on a steel tower 1,400 feet 293° 30′ from the front light.

Tawas Bay, Mich., about 4 miles wide and facing the south, is formed by **Tawas Point,** inclosing it on the east, and the curving mainland on the north and west. It is an excellent harbor, affording secure anchorage at its head, in all winds except from the southwest.

Tawas City and **East Tawas** are located on the northwest shore of the bay, about 1¼ miles apart. A black elevated water tank in Tawas City, and a blue one in East Tawas, are good landmarks on the lakefront. There is also a lighted radio mast near the tank at East Tawas. The 18-foot contour is about 1¼ miles out along this frontage, and about ⅜ mile out at the head of the bay.

Aids to Navigation.—Tawas Light, about ¾ mile from the southwest end of Tawas Point, is a light with a red sector, 70 feet above the lake on a white conical tower with dwelling attached: a fog horn diaphragm is located ⅝ mile southwest of the lighthouse. The red sector shows between bearings 045° and 135° toward the light, covering a sand flat which extends to a distance of about 1 mile westward of the light; the northwesterly edge of the flat is very abrupt, dropping from 6 to 24 feet in a vessel's length. A lighted buoy is moored about 2,500 feet off the extreme southwest point of the shoal and another buoy marks its northwest corner. A light marks the northeast end of the breakwater extension, which protects the State dock at East Tawas.

To anchor in Tawas Harbor, vessels should round the lighted buoy and pass about 800 feet west of it on a due north course; when Tawas Light bears 112½°, change course to 045° and anchor in about 24 feet over sand and clay, with the light bearing about 135° distant one mile.

From the eastward, vessels will enter the red sector of Tawas Light just before the turn at the lighted buoy.

Tawas Bay Yacht Club Range, located on shore at the east end of the bay, marks the channel leading to the yacht club basin; the rear light is 150 feet 165° from the front light; the front light is 8 feet above the water and the rear light is 12 feet above the water and both are mounted on posts.

A private range, located on shore northeast of the yacht club, marks the channel leading into a marina basin; the rear light, 20 feet above the water, is 400 feet 128° from the front light which is 12 feet above the water.

Harbor Facilities.—At Tawas City some of the old dock remains have been repaired and put in fair condition for use by fishermen. There are limited facilities for small craft at the mouth and along the lower portion of the Tawas River. A depth of 2 feet was reported available over the bar at the river mouth in September 1977. At East Tawas, the dock at the State Park extends from the foot of Newman Street. The dock is operated for the benefit of transient boatmen by the Michigan State Waterways Commission and provides water, sewage pump-out facilities, electricity, lights, gasoline, and harbormaster services. Depths along the northeasternmost arm are 12 feet on each side and off the end. The dock is protected by a breakwater extension which should not be approached closely due to stone riprap. About 1,500 feet east of the State dock there are two fish docks in fair condition. A depth of 3 feet was available alongside in May 1963. Basins and approach channels have been dredged at the easterly end of Tawas Bay by private interests. There was a depth of 4 feet in the channel and 4 feet in the basin at the Yacht Club and 5 feet in the channel and 4 feet in the basin at the marina in May 1963.

Coast Guard Station.—East Tawas Coast Guard Station is located about ⅝ mile northeasterly from the lighthouse.

National Weather Service Warning Display Stations.—Signals are displayed from a steel tower at the end of Tawas Point, just north of the fog signal.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline for East Tawas, located 150 feet west of the state dock, extends 1,000 feet 170° to a crib with 9 feet over. It is unmarked.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding.

R 281.735.4. Tawas river in Tawas City and area adjacent to its mouth; slow—no wake speed.

4. On the waters of the Tawas river, sections 25, 30 and 36, town 22 north, range 7 east, Tawas City, Iosco county, from the north city limits downstream and 300 feet in any direction from the mouth of the river in Tawas bay, * * *

From Tawas Point to Au Sable Point, the shore is obstructed by shoals and submerged net stakes, and should receive a berth of 1½ miles. There is shoal water around Au Sable Point, extending out for a distance of 1¼ miles. Under this point, there is good holding ground and protection from winds from north to west. A buoy is moored in about 50 feet of water about 2¾ miles from the point, and marks the limit of safe approach on its east side.

Section III.—West Shore From Au Sable Point to Presque Isle, Mich., Including Thunder Bay.

Chart 14863.—Between Au Sable Point and Au Sable, 5½ miles north, the foul ground makes it unsafe to approach the shore nearer than 2 miles. Shoals with 12 or 14 feet least depths lie 1½ miles north of Au Sable Point and 1½ to 1⅞ miles from shore, extending 2¼ miles in a northerly direction. A shoal with 9 or 10 feet depth extends in a northeasterly direction from 2 miles below the mouth of the Au Sable River to a point over 1 mile east of Au Sable North Pierhead Light. The shore line continues low along this reach with no prominent landmarks.

Au Sable Harbor, Mich., commonly called **Oscoda,** is a harbor at the mouth of the Au Sable River that has been improved as a Harbor of Refuge. The river extends westerly about ½ mile from the entrance, thence northerly almost a mile before curving to the west. Strong currents in the harbor prevail when the dam upriver a short distance is used for power generating, normally only a slight current is noted. The towns of Au Sable, Michigan and Oscoda, Mich. front on the river. The harbor is used chiefly by pleasure craft. There is a black elevated water tank near the second bend in the river about ½ mile inland from a point a mile north of the entrance. An elevated silver tank is located about 2,000 feet from shore and 2½ miles north of the entrance. Both are prominent landmarks and have lights on top as required by operations at Wurtsmith Air Force Base located about 3 miles northwesterly.

Channels.—A dradged entrance channel enters the river from Lake Huron between parallel piers and leads upstream for about 0.2 mile to the U.S. Route 23 highway bridge. In 1976, the controlling depths were 10 feet in the approach channel, thence 8½ feet between the piers, thence 6 feet in the river decreasing to 4 feet within 150 feet of the bridge.

Aids to Navigation.—Au Sable South Pierhead Light is located on the outer end of the south pier and a diaphragm fog horn sounds as required. Au Sable North Pierhead Light is located on the outer end of the north pier. The entrance to the harbor is not marked except for the pierhead lights.

Harbor Facilities.—The lower one mile of the river above the U.S. Highway #23 bridge has controlling depths of 3 feet, but is obstructed by a submerged crib near midchannel about 1,500 feet above the highway bridge. Above the bridge, private facilities provide limited transient dockage, gasoline, diesel fuel, water, ice, electricity,

launching ramp, marine supplies, and engine repairs. A 20-ton mobile hoist is reported available northeast of the bridge.

The Mill Street fixed bridge, about 3,500 feet farther upstream above the Highway #23 bridge, has a vertical clearance of 12.0 feet. Submerged piles are located under the bridge about 15 feet east of the original bridge westerly abutment which was at the same location.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceeding. Regulation No. 35, Iosco county.

R 281.735.3. Au Sable river, lower part; slow—no wake speed.

3. On the waters of the Au Sable river, sections 3, 4 and 10, town 23 north, range 9 east, township of Au Sable, and sections 33 and 34, town 24 north, range 9 east, township of Oscoda, county of Iosco, state of Michigan, from its mouth at Lake Huron upstream to the Detroit and Mackinaw railroad bridge, a distance of approximately 2-½ miles, * * *

Charts 14863, 14864.—From Au Sable North Pierhead Light to Sturgeon Point, 21 miles northerly, shoals having less than 18 feet depth, and with numerous rocky patches of 12 to 16 feet near the outer limits, make out a maximum distance of 2¾ miles from the shore, and deep-draft vessels should give this stretch a berth of 3 miles. The spot lying farthest out is a small boulder shoal with 16 feet least depth, located 10.6 miles 017½° from Au Sable North Pierhead Light.

Opposite Harrisville, Mich., about 17½ miles north of Au Sable and 3½ miles south of Sturgeon Point, the shoal border abruptly narrows from 2½ miles to 1½ miles. This narrow portion of the shoal extends about two miles north where it again widens.

The shore line continues low for about 13 miles north of Au Sable to just north of the village of Greenbush, Mich., where high bluffs begin a short distance back from shore and continue with varying widths of low ground along shore, past Sturgeon Point.

Oscoda Aero Light, maintained by the U.S. Air Force at Wurtsmith Air Force Base, shows alternate flashing white and green on a checkered elevated water tank 3½ miles 325° from Au Sable North Pierhead Light. The light operates throughout the year from sunset to sunrise, and during daylight hours when visibility is 3 miles or less or cloud ceiling 1,000 feet or less.

Caution Area.—Special Use Airspace, as noted in Federal Regulations 14 C.F.R., Part 73 (Federal Aviation Adm., Dept. of Transp.), Special Use Airspace, consists of the area above the surface of the earth as outlined by geographic coordinates and is to be used and controlled for specific purposes in the operation of aircraft. **Area R-4207,** Upper Lake Huron, Mich., beginning at 45°17′00″ N., 83°00′00″ W.; to 45°20′24″ N., 82°31′18″ W.; along the United States-Canadian Border to 44°31′00″ N., 82°19′54″ W.; to 44°27′42″ N., 82°47′08″ W.; to the point of beginning may be used for air to air gunnery practice from the surface to a flight level of 45,000 feet. The using agency is the Commander, Permanent Field Training Site Detachment, Phelps-Collins ANGB, Alpena, Mich., and the time of designation is sunrise to sunset. The Controlling Agency is the Federal Aviation Administration, Minneapolis ARTC Center.

Mariners are cautioned to consult U.S. Coast Guard, NINTH District Local Notice to Mariners for additional information, firing schedules and changes.

Chart 14864.—Harrisville Harbor, Mich., is located at Harrisville, the county seat of Alcona County, and affords the only safe refuge for light draft craft between Au Sable and Alpena, Michigan. This harbor provides adequate protection from all winds, however

Bridges, etc. Across the Au Sable River

No.	Location and name	Kind	Miles above mouth of river	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	U.S.—23	Highway	0.26			81.0	23.2		Fixed. New in 1973.
2	Mill Street	do	.60	45.0	45.0	48.3*	12.0	8.5	Fixed. New in 1971.
3	Adams Avenue	do	1.60			35.5	9.2	5.2	Fixed.
4	Submerged pipeline		2.59						Approx. depth 15.4 feet.
5	Detroit and Mackinac	Railway	2.60						Fixed.
6	Submerged pipeline		5.40						Approx. depth 19.6 feet.
7	Wurtsmith	Highway	6.30			33.0	13.8	10.7	Fixed.
8	Foote Dam		6.90						

*Center span for navigation.

storms from the northeast cause large swells in the harbor. An elevated silver water tank on high ground about ¾ mile west of the harbor is a prominent landmark.

Channels.—A dredged entrance channel leads southwest from Lake Huron to a harbor basin formed by two detached breakwaters. In 1977, the controlling depth was 10 feet in the entrance channel except for shoaling to 7 feet along the edges with 6 to 8 feet in the harbor basin except for shoaling to 4 feet in the northwest corner. The south end of the harbor is not closed and is accessible by small craft of 2-foot draft.

Aids to Navigation.—Harrisville East Breakwater Light, 20 feet above the water on a white column, is located on the northerly end of the East Breakwater. The West Breakwater Light, 20 feet above the water on a white column, is located on the southeasterly end of the north breakwater, about 500 feet 253° from the East Breakwater Light.

Harbor Facilities.—A public dock, provided by the Michigan Waterways Commission and the city of Harrisville, is located in the southerly portion of the harbor and provides mooring facilities, water, sewage pump-out facilities, electricity, gasoline, diesel fuel and harbormaster services. Minor engine repairs and groceries are available nearby.

Submarine Pipeline.—About ½ mile north of Harrisville Harbor, the Lakeshore Terminal Co., Tawas City, has a submarine pipeline and prominent storage facilities on the shore for receiving and storing petroleum products brought in by tanker. The steel pipeline extends east into the lake 7,500 feet. The shoreward 1,750 feet is buried below the lake bottom out to about the 20-foot contour and the remainder is exposed on the lake bottom. The outer end of the line is marked by a privately maintained marker buoy and a series of privately maintained buoys and mooring buoys in the immediate area. To mark the approach to the mooring, a range is maintained on shore with the front light 34 feet above the lake on a skeleton tower 350 feet from shore and the rear light 64 feet above the lake on a skeleton tower 850 feet 269°09′ from the front light.

Sturgeon Point Light, 69 feet above the lake on a white conical tower, is on the most easterly point between Saginaw and Thunder Bays. A spit with 8 feet near its extremity extends 1¾ miles northeasterly from Sturgeon Point. Thence for 12 miles to South Point of Thunder Bay the coast should be given a berth of 3 miles to avoid the very shallow inshore reefs and many outlying shoals of boulder formation, the latter having depths of 12 to 20 feet, and the most easterly spot being located 5 miles northerly from Sturgeon Point Light and 2½ miles offshore. Off the mouth of Black River, 4½ miles south of South Point, foul ground with 8 feet of water and less reaches to the east for 1½ miles, and also northeasterly to Black River Island, between which and the adjacent shore there is only 1 or 2 feet of water.

Wreck.—The remains of a large wooden vessel, located about ¾ mile east of the mouth of the Black River, project about 3 feet above the water.

Thunder Bay, Mich.—Thunder Bay is the second (after Saginaw Bay) most prominent indentation on the west shore of Lake Huron. The extreme points are North Point and South Point, 10 miles apart, and the distance northwesterly to the mouth of Thunder Bay River from a line joining these two points is about 9 miles.

The bay affords shelter in all but southeasterly gales, and good holding ground is found generally under the shores. The north shore from Whitefish Point to North Point affords a good lee in heavy northeast gales, in depths of 25 to 30 feet, close to shore, with clay and sand bottom.

The southwesterly shore for about 5¾ miles from South Point to Ossineke is filled with shoals and flats: the shoal water extends from South Point about 2¾ miles northward to a point about ½ mile beyond Scare Crow Island, and thence borders the shore for a width of 2½ miles. Ossineke, at the mouth of Devil River, formerly had large lumbering interests and good shipping facilities; it now has no dock.

From about 1 mile northerly of Ossineke to the vicinity of Sulphur Island, about 4 miles north, there are depths of 17 feet to within ½ mile of the shore. Sandy flats with less than 12 feet of water connect Sulphur Island with the mainland at Squaw Bay, and a stony shoal with 1-foot depth on its outer portion extends 1 mile northward from the island, to abreast of Partridge Point. Detached stony patches with 8½ to 11 feet depths lie 1⅜ miles east and 1⅝ miles southeast of the island. Between Partridge Point and Alpena Harbor at the mouth of Thunder Bay River, a stretch of 3½ miles, the coast abounds in detached shoals for 2 miles out; a spot with 4 feet least depth lies 1½ miles northeasterly from Partridge Point and 1¾ miles from the shore to the west; another, with least depth of 8 feet, lies 1¼ miles southerly from Alpena Light. There are also many submerged net stakes in the deeper water within a distance of 2 miles to the east and northeast of Partridge Point.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline of the city of Alpena commences at the shoreline 7,750 feet 229° from Alpena Harbor Light. The pipeline extends 1,150 feet 111½° to a crib in about 8 feet of water with 4 feet over the crib and continues on 850 feet 111½° to a second crib in about 13 feet of water with 8 feet over the crib. This installation is not marked.

The northerly shore of the bay from Whitefish Bay 1½ miles northeast (which is quite shallow) to North Point, 8 miles southeast of the mouth of the Thunder Bay River, may be safely approached to within 1 mile. At North Point, a shoal sets out for 1½ miles in a southeasterly direction, with only 5 feet of water near the outer end and its extremely marked by a buoy. A lighted bell buoy, 3.1 miles south of North Point and 4.9 miles southwest of Thunder Bay Island Light, marks the point of departure of the vessel courses at the entrance of Thunder Bay.

Wrecks.—An old wreck about 250 feet long and 50 feet beam, with about 3 feet of water over it and surrounding depths of 17 feet, lies in the northerly part of Thunder

Bay about 3,960 feet 120° from Huron Portland Cement Co. front range light. It is marked by a wreck buoy. Two other wrecks, each located about a mile offshore, have least depths of 20 and 29 feet and are, respectively, 4 and 2 miles westerly of the tip of North Point, but are not marked.

Alpena Harbor, Mich.—This harbor is located on the northwest shore of Thunder Bay and comprises the lower reach of Thunder Bay River and the approach in Thunder Bay. Private channels lead northerly from this approach to docks of the Huron Cement Div., National Gypsum Co. located ½ and 1 mile northeast of the river. A municipal marina is located just southwest of the river mouth. Thaffic is mainly receipt of coal, salt, and gasoline, and the shipping of cement. Prominent are stacks at the cement plant and stacks, spires, and tanks in town.

Bridge.—A highway bridge spans the river at Second Avenue, about ½ mile above the mouth. It is a double-leaf bascule type, with horizontal clearance of 80.2 feet and vertical clearance of 8.9 feet. Signal for opening draw, 3 blasts (— — —), a siren on the bridge sounds return signals. Advance notice is required, see Bridge Regulations § 117.697, preceding. The bridge is lighted according to United States Coast Guard regulations for lighting bridges. In June 1978, the bridge was reported to be inoperable.

Bridge.—The new Ninth Avenue fixed bridge, completed in 1972 over the Thunder Bay River, mile 1.0 at Alpena, Mich., has a vertical clearance of 12.0 feet and a horizontal clearance of 77.0 feet. The bridge is unlighted.

Fluctuations of Water Level.—Each year the level of Thunder Bay River rises and falls about 3½ feet. From day to day the level changes somewhat, due to wind and barometric pressure, such changes frequently amounting to more than 1 foot. Occasionally a considerable oscillation takes place within a few hours, due to violent northerly or southerly winds.

Channels.—A dredged entrance channel leads northwest from the deep water in Thunder Bay through the mouth of Thunder Bay River to a turning basin 0.7 mile above the mouth. The channel enters the river on the north side of a pier extending from the south side of the mouth. In 1977, the controlling depths were 20 feet in the entrance channel to within 0.5 mile of Alpena Light, thence 15 feet to the turning basin with 15 feet in the basin except for shoaling to 14 feet in the west corner.

Aids to Navigation.—Alpena Light, 44 feet above the lake and mounted on a red skeleton tower on a concrete crib, is located on the north side of the entrance to the river and serves as a guide into the river; diaphragm foghorn and a marker radiobeacon are operated at this station. The base of the light structure is surrounded by protective rip-rap extending horizontally out from the structure about 27 feet and should not be passed close aboard even by vessels of shallow draft.

Alpena Yacht Club Light, 25 feet above the water on a red skeleton tower, is located on the southwest end of the yacht basin breakwater 1,900 feet 231½° from Alpena Light.

The approach to Alpena Harbor through the main channel is well marked with buoys.

The turn at the intersection of the channel leading to the westerly dock of the Huron Cement Div., National Gypsum Co., with the Alpena approach is marked by a buoy. The alignment from the turn to the dock is marked by a range on shore, bearing 358°. The range front light is 22 feet above the water on a black skeleton tower and the range rear light is 38 feet above the water on a black skeleton tower.

An approach channel about 1¼ miles long leads from the point of intersection with the Alpena approach to the more active easterly docks of the Huron Cement Div., National Gypsum Co. It is marked on the easterly and westerly sides by buoys placed 50 feet off the deepened portions of the channel banks. This is to permit additional maneuverability for light vessels. Loaded vessels should navigate at least 50 feet inside the buoys. A front range light is located on the easterly side of the harbor berth, abreast of the southerly end of the stone-loading dock, 76 feet above the water on a skeleton tower. The rear light, 109 feet above the water on a skeleton tower is 740 feet 344° from the front light.

Harbor facilities.—At the mouth of the river, a commercial dock on the north bank receives coal, and another on the south bank receives salt and gasoline. The city dock, extending about 400 feet downstream from the Second Avenue bridge and along the southerly side of the river. is in good condition.

The westerly dock of the Huron Cement Div., National Gypsum Co. is not in active use. In 1977, depths of 17 feet were reported in the channel and slip.

The easterly Huron Cement Div., National Gypsum Co. Dock is being used and is situated ⅞ mile northeasterly of Alpena Light. In 1977, the privately dredged entrance channel had a reported controlling depth of 23 feet. A breakwater dock on the easterly side of the channel and a spoil bank on the westerly side, form a sheltered harbor berth which extends about 1,000 feet northwesterly therefrom. The easterly portion of this berth consists of a slip approximately 430 feet long and 85 feet wide. The northwesterly 500 feet of this berth consists of two parallel slips 100 feet wide. In 1977, depths of 23 feet were reported at the berths. Between the slips is a loading dock. Cement warehouses are on the easterly side of the harbor.

The marina basin, located about 1,900 feet southwest of the river mouth, is protected by concrete and rubble breakwalls and affords shelter for small craft. In June 1978, the reported controlling depths were 4 feet in the entrance and 5 feet in the basin. Transient mooring facilities are available for 20 craft. Water, electricity, gasoline, diesel fuel, sewage pump-out facilities, marine supplies, launching ramp, 25-ton hoist, repair facilities, and harbormaster services are available. The basin entrance opens to the southwest. The facility was developed by the Michigan State Waterways Commission and the city of Alpena, is owned by the city, and is privately operated. A hospital and other facilities are available in Alpena.

Bridge Regulations.—See 33 U.S.C. 499, published in

Certain Laws, preceding and 33 CFR § 117.697 of Rules and Regulations preceding.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 4, Alpena county.

Local Harbor Regulations.—On the waters of the Thunder Bay River and floodwaters from the west line of section 21, town 31 north, range 8 east, downstream and 300 feet in any direction from the mouth in Lake Huron, it is and shall be unlawful for the operator of a vessel to exceed a **slow-no wake speed.**

The harbor regulations are enforced by the Chief of Police who acts as **harbormaster.** Copies of the regulations may be obtained from Chief of Police, City Hall, Alpena, Michigan 49707.

Charts 14864, 14869.—The stretch of coast from North Point and Thunder Bay Island to Presque Isle is about 25 miles long and trends generally to the northwest. From the tip of North Point the trend is northwesterly for about 8½ miles to **South Nine Mile Point;** then northwest for 9 miles to the inner end of False Presque Isle Harbor; then easterly about 1½ miles and northeast 1¼ miles to the easterly point of False Presque Isle, and then northwesterly for 8 miles to the north tip of Presque Isle. There are outlying islands and shoals and numerous points and indentations while the shore line is generally low and wooded with no prominent hills.

Thunder Bay Island, Mich., is situated 3 miles northeasterly of North Point. The island is about ¼ mile wide and 1½ miles long along a northwest-southeast axis. A submarine cable on the lake bed extends from North Point to the abandoned Coast Guard Station on the west side of the island.

Thunder Bay Island Light, 63 feet above the lake on a white conical tower, is located on the east shore of the island about 1,200 feet from its southeast end; a fog diaphone and a radiobeacon are operated at this station.

Wreck.—The wreck of the **SS Monrovia,** which sank after a collision in 1959, is located approximately 13.6 miles 106° from Thunder Bay Island Light in 165 feet of water. Soundings made over the wreck in 1964 disclosed 43.7 feet of water over the highest part of the ship. The wreck is not marked.

Sugar Island, roughly ⅝ mile square, is located about ½ mile west of the northerly portion of Thunder Bay Island. The shoal water extends about ½ mile southwest and southeast of Sugar Island and shoal water to the north, including **Gull Island,** extends about ¾ mile. The waters between North Point and Sugar Island, 2 miles eastward, can be used only by small craft, and with extreme caution, since there is a shoal which makes out from the north side of the point and extends almost to the island.

There is shelter of limited capacity between Sugar Island and Thunder Bay Island, with depths of 6 to 12 feet, good holding ground, and protection from east, northeast and northwest winds. The entrance is from the south; it is not safe to enter from the north. The holding ground on the south of Sugar Island and on the southwest of Thunder Bay Island is not good, the bottom being rocky and stony. Spits extend ½ mile southeast from Sugar Island and 1,000 feet southeast from Thunder Bay Island. Large vessels should not attempt to pass between Thunder Bay Island and the mainland; the easterly or lakeward face of the island is deep-to.

Misery Bay is a bight of about 1½ miles between the north side of North Point and **Potter Point,** about 3 miles northwest. This area is extremely shoal and filled with rocks and islands of which the largest is **Crooked Island,** located near the center of the bight.

From Potter Point to abreast of Middle Island, which latter is about 11 miles northwesterly from Thunder Bay Island, the main shore is irregular, with an offshore bank generally less than ¾ mile in extent, but with some submerged net stakes between 1 and 2 miles out. Also, a detached small boulder shoal with 13 feet depth lies 1⅝ miles northeasterly from the north point of Crooked Island and about 1 mile offshore at Potter Point.

Thunder Bay Island Shoal.—The easterly end of a large area of boulder shoals with least depths of 22 to 24 feet, in surrounding depths of 31 feet or more, lies 7 miles northerly from Thunder Bay Island and 8½ miles southeasterly from Middle Island. Inside the 30-foot contour, it extends about 4½ miles westerly with a maximum width of about 3½ miles and is in the path of through traffic, constituting a possible menace to deep laden vessels in heavy weather.

Wreck.—The stranded German freighter **M./V. Nordmeer** went aground at approximately 45°08′10″ N., 83°09′30″ W. on Thunder Bay Island Shoal on 19 November 1966. In April 1970, a 70-foot cargo boom approximately 14 inches in diameter and extending approximately 3 feet above the water, was reported in a position 100 yards southwest of the wreck. A buoy is located on the southeast end of a 22-foot shoal spot, approximately 1,150 feet southeasterly from the wreck. In July 1975, a 150-foot barge with crane aboard, sank about 100 feet east from the amidship of the Nordmeer while conducting salvage operations.

Middle Island is situated 1½ miles northeast of the mainland, 2¾ miles north of South Nine Mile Point, and 5 miles southeast of False Presque Isle Harbor. It is ⅞ mile long northwest and southeast, and ⅝ mile northeast and southwest.

There is a shoal midway between Middle Island and the mainland with a least depth of 5½ feet, and other patches with depths of 9 to 12 feet make this passage dangerous for strangers. A submarine cable crosses from the southwesterly side of Middle Island, extending in a southwesterly direction to the mainland. A rocky shoal with spots awash, 3,000 feet southeasterly from the southeast point of Middle Island, is marked by a buoy at the northeast end. Flats extend ½ mile south of the south point of Middle Island, and for about 1 mile off the southwest side and 1,200 to 2,100 feet off the northwest side of the island. Middle Island Light, on the northeasterly point of the island, is 78 feet above the lake on a white conical tower with orange bands in the middle.

To the southwestward of the island there is fair holding ground in clay and boulders and protection from winds from south through west to northeast. To the northwestward of the island there is good holding ground in mud and sand and protection from southeast winds. In using these anchorages, the island should be given a proper berth to avoid the adjacent shoals.

Rockport, Mich., located about 2¼ miles westerly from Middle Island and about 3½ miles southerly from False Presque Isle, is a private harbor used primarily by sport fishermen. In June 1978, the pier and detached cribs of a former loading dock were in ruins. The submerged remains of a former sand and gravel breakwater extend 500 feet north from the point east of the pier. The area is very shoal and should be avoided. A basin southeastward of the pier has a natural launching ramp.

False Presque Isle Harbor, about 18 miles northwest of North Point at Thunder Bay and about 6 miles southeast of Presque Isle Harbor, is a protected area lying under the south side of False Presque Isle, a nearly detached body of land projecting about 1½ miles east from the main shore. This is a secure harbor for winds from southwest around through north to northeast, with fair anchorage in depths of 20 to 30 feet. From the point at the southwest side of the harbor, flats and detached shoals extend southeasterly for 2¼ miles with depths of 7 to 10 feet 1 mile off shore. Directly in the harbor approach about 1 mile southeast of the southeasterly point of False Presque Isle, there is a rocky shoal with 18 feet of water over it. About ⅜-mile easterly of the above 18-foot spot, there is a boulder shoal with only 15 feet of water over it, located 4.1 miles northwesterly of Middle Island Light.

Northwesterly from False Presque Isle, the water is deep at from ¼ to ⅜ mile offshore up to the very shoal bight just below Presque Isle Harbor.

Stoneport, Mich., located about 5½ miles southeast of Presque Isle Light and about 2 miles northwest of False Presque Isle, is a private harbor owned and maintained by the Presque Isle Corp. and used for the shipment of limestone. The harbor is formed by an L-shaped breakwater which extends about 1,000 feet 028° out from shore, thence 1,200 feet 120°. The dock face is along the inshore side of the outer arm. The dock, equipped with a conveyor with a capacity of 5,500 tons per hour, is about 930 feet long with a deck height of 12 feet. There is open storage for 60,000 tons of limestone. In June 1978, a depth of 25 feet was reported alongside.

Aids to Navigation.—Stoneport Light, 55 feet above the water on a white cylindrical structure, is located near the southeasterly end of the dock. Two buoys are located in 23 feet of water to mark the southwesterly limit of maintained area opposite the dock face, and another buoy in 25 feet of water, 4,000 feet 126° from Stoneport Light, marks the approach to the dredged area.

The conveyor and other structures on high ground near the harbor are prominent from the lake.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake is located in a well system on the northeast shore of the L-shaped breakwater approximately 600 feet northwest of Stoneport Light.

Presque Isle Harbor is a bay about ½ mile across at its entrance between **North Albany Point,** the mainland point on the south, and the southerly end of Presque Isle peninsula on the north, with shore indentation of about ¾ mile within this line. It affords a safe but limited harbor and anchorage for small vessels. A bar across the entrance limits the draft in entering the harbor but vessels can carry about 10 feet on the range line. Inside the bar, there is an area of about 60 acres with depths of 13 to 18 feet. The entrance is marked by a lighted range located on the west shore of the harbor; the rear light, 36 feet above the water, is located 790 feet 274° from the front light which is 23 feet above the water on a white pole.

To anchor in the harbor, when in 36 feet of water with the old lighthouse tower on the south end of Presque Isle bearing northwesterly, distant about 1 mile, stand in on the range until the old lighthouse bears 022½°, then haul up a short distance northward or southward of the range line and anchor. In June 1978, shoaling to 5 feet was reported on the range line about 1,200 feet east of the front light. The south entrance point should be given a good berth on account of a spit extending northerly from it. A 5½-foot shoal lies 3,000 feet easterly from the old lighthouse. A buoy, located 3,525 feet 106° from the charted old lighthouse tower on Presque Isle, marks the north side of the entrance to the harbor and the south side of the 5-foot shoal.

Harbor Facilities.—A privately owned dock 500 feet long, used for the mooring of small craft, is on the north side of the harbor. The approach to the dock is marked by a private lighted range. In June 1978, 7 feet was reported in the approach along the line of the range. A sand shoal with a depth of 3 feet was just west of that line and about 250 feet south of the front range light. Gasoline, diesel fuel, water, ice, electricity, marine supplies, pump-out facilities, a surfaced ramp, and diesel repairs are available at Presque Isle Harbor.

Presque Isle Light, 123 feet above the water on a white conical tower with dwelling attached, is located about 1,500 feet from the north end of Presque Isle peninsula; it marks the turning point for the Straits of Mackinac.

North Bay, about 1½ miles long to its head, lies west of and is protected by Presque Isle peninsula; it affords shelter and anchorage in easterly and southerly winds, but the bottom is rock. The west side of the peninsula should be given a berth of ⅓ mile, and the westerly bay shore opposite a berth of about ¼ mile. A shoal with 14 feet lies about in the middle of the bay, and the prevailing depths range upward to 30 feet. The rear light of the Presque Isle range is opened out as a guide into North Bay, and this harbor is used in southeast and east gales. Vessels entering the bay on a 157½° course, heading for the above light, will find deep water to within ⅓ mile of the head of the bay.

Section IV.—Westerly Shore From Presque Isle to Old Mackinac Point, Mich., and Straits of Mackinac, Lake Huron

Charts 14864, 14880.—The trend of the shore line from Presque Isle to Forty Mile Point, Mich. is northwest for about 11½ miles to the north tip of **Adams Point**, westerly for about 4½ miles past Calcite to the small-boat harbor at Rogers City and thence northwesterly to Forty Mile Point.

Black Point, on the west side of North Bay and about 2 miles from Presque Isle Light, may be approached within ¼ mile. **Thompsons Harbor**, 2 miles west of Black Point, is available only for small craft drawing 4 feet of water; strangers should run under check and keep near the easterly side, to avoid several submerged boulders lying from ½ mile out to near the entrance. Two miles southeasterly of Adams Point, there is a detached shoal with least depth of 17 feet. As the foul ground extends from shore to within ½ mile of this shoal, coasting vessels, from abreast of **Little Trout River** (marked by a thick mound-shaped patch of woods), should keep north of a line with Adams Point bearing west. Adams Point buoy is located in 40 feet of water about ¼ mile north of the point. The coast from Adams Point 3½ miles westerly to Calcite and thence northwesterly to Forty Mile Point can be approached generally to within ½ mile.

Calcite, Mich., about 3¼ miles west of Adams Point and 1½ miles east of Rogers City, is the location of a harbor and the headquarters of the Michigan Limestone Operations, U.S. Steel Corp., which has facilities for the storage, loading, and shipment of limestone. The harbor affords no shelter from north to east winds for vessels except yachts and small craft which can enter the tug basin on an emergency basis only. The harbor entrance is protected on the northwest and north by a point and a breakwater and to the southeast by **Quarry Point**. The loading slip is 190 feet wide and extends 1,000 feet in depth to the shore.

The breakwater protecting the harbor on the north extends from a point near the outer end of the loading slip about 600 feet northerly; thence about 2,000 feet northeasterly; and thence about 1,200 feet easterly. The harbor is exposed to wave action from an easterly direction. Opening on the northerly side near the outer end of the slip, there is a tug basin 750 feet by 400 feet, fully protected, and the company maintains tugs to assist vessels entering the loading slip. There is a dock line extending 1,000 feet southeast from the outer end of the slip.

The slip and a 200 foot wide channel extending 1,600 feet from the slip to deep water in the harbor basin have been dredged to 25 feet. In April 1978, a controlling depth of 25 feet was reported in the channel and slip. In 1972, the controlling depths were 25 feet in the southerly half and 14 feet in the northerly half of the tug basin and 24 to 20 feet along the dockline southeast of the slip.

Aids to Navigation.—Calcite Breakwater Light, mounted 49 feet above the water on a white skeleton tower, is located on the outer end of the breakwater; a fog whistle is maintained at the light. Two sets of range lights are maintained by the company. Vessels approaching the harbor should use the incoming range of red lights marking an alignment along the southerly side of the channel. The front and rear lights are, respectively, 72 and 180 feet above the water. Also, the 2 basin buoys, placed in 19 feet of water, mark the edge of shoal water southeast of the channel and incoming vessels should keep to northward of these buoys. Calcite Light, a large red neon light on top of the screen house at the inner end of the slip, 190 feet above water and in line with the two red incoming lights is a prominent landmark.

Departing vessels should use the outgoing range of green lights marking the center of the channel, which leads 056° past the end of the breakwater and into the open lake. The front and rear lights are, respectively, 115 and 55 feet above the water.

Harbor Facilities.—In order to load cargo it is necessary to wind and then tow vessels stern first into the loading slip. A vessel should contact the Tug "Limestone" or "Dolomite" by radio so as to be advised whether it may enter the harbor. Both tugs are equipped with AM and FM radiotelephones. When the tugs are laying at the dock, they may be contacted through Maritime Radio Station WLC, Rogers City. Because of water fluctuations in the harbor, incoming vessels drawing over 17 feet of water should obtain information from the harbor tugs before passing the breakwater.

Blue prints of the harbor may be seen and information as to depths obtained at the dock office on the southerly side of the loading slip. A water gage, lighted at night, located on the southwest corner of the tug basin, shows the maximum draft to which vessels may be loaded and should be checked by masters.

Rogers City, Mich.—This is the county seat of Presque Isle County, and is situated 4¾ miles west of Adams Point and about a mile east of the mouth of Trout River, which empties into the lake about 5¾ miles southeasterly from Forty Mile Point. It is served by the Detroit & Mackinac Railroad, and the principal industries are tourism and the mining, processing, and transportation of limestone. The port is an open roadstead with no natural harbor but protection for small craft is available in two artificial harbors contructed by the government and by private interests. An elevated silver water tank, located about ⅔ mile southwest of the municipal basin is a prominent landmark.

Aids to Navigation.—The East Breakwater Light is located on the southerly end of the East Breakwater, 2,190 feet 105° from the silo at Rogers City. The West Breakwater Light is on the easterly end of the West Breakwater, 1,980 feet 105½° from the silo at Rogers City.

Harbor Facilities.—The City and Michigan State Waterways Commission have provided a municipal boat basin, at the foot of Michigan Avenue, comprising a dredged area roughly 350 feet by 500 feet, sheltered on the northwest and northeast sides by an L-shaped steel, earth and rubble-mound breakwater, and on the southeast side by a rubble-mound breakwater allowing entrance from the southeast. There is a steel sheet piling revetment on all sides except the southeast side of the basin. There was a least depth of 4 feet in the harbor basin in September 1972. The City

and Waterways Commission have provided public docking facilities within the harbor with water, sewage pump-out facilities, electricity, lights, gasoline, diesel fuel, restrooms, and shower facilities available. There is also a launching ramp available. The channel into the basin is marked with private aids.

A smaller north basin, located at the foot of Huron Avenue, was constructed by commercial fishermen and consists of earth filled rubble-mound breakwaters. The narrow entrance has a 3-foot controlling depth and must be approached from the northeast. Entrance is difficult during severe storms.

Forty Mile Point Light, located below the top of the bluff on **Forty Mile Point**, about 22 miles 293° from Presque Isle light, is 66 feet above the water on a white square tower with dwelling attached.

Charts 14880, 14881.—The northwest arm of Lake Huron forms the easterly approach to and a portion of the Straits of Mackinac. At a distance of 40 miles from its west end, the arm is 32½ miles wide along a north-south line between Forty Mile Point and Point De Tour on the north shore. At 20 miles from the west end, the arm is 19 miles wide between Cordwood Point, which is 24 miles northwest of Forty Mile Point, and Marquette Island on the north shore. At the west end, the arm abruptly narrows to 4 miles between the Old Mackinac Point, 21 miles west of Cordwood Point, and Point St. Ignace on the north. This is the narrowest part of the Straits between Lake Huron and Lake Michigan and is spanned by the Mackinac Bridge.

The easterly half of the arm is clear and unobstructed to within 1½ miles of shore except for two detached reefs, **Spectacle Reef** and **Raynolds Reef** well offshore, and a group of reefs extending 4 miles off the north shore and terminating in **Martin Reef**. Spectacle Reef, described under North Channel, is 22 miles 331° from Forty Mile Point Light and 12 miles 051° from the north tip of Cordwood Point. Raynolds Reef is 3 miles west and Martin Reef is 9 miles north of Spectacle Reef.

The westerly half of the arm is obstructed by islands and shoals. The two main shipping channels through this area are the South Channel and the North Channel. The north shore is then described from Point St. Ignace east.

At 1¾ miles westerly from Forty Mile Point Light a sand and gravel spit, with depth under 15 feet, extends ¾ mile from the shore in a northeast direction. With this exception the shore between the light and the east point of Hammond Bay, 6¼ miles westerly, may be approached within ½ mile.

Hammond Bay, Mich.—This bay is about 6 miles long between its southeast and northwest points, with indentation inshore of about 2 miles. It affords shelter in all winds from southeast through south to northwest, with fair anchorage in 25 to 30 feet off the mouth of **Ocqueoc River**, which empties into the south side of the bay. A boulder shoal with about 10 feet of water makes out a distance of ⅜ mile from the shore at the southeast point of the bay which is marked by the buildings of a former Coast Guard lifeboat station now occupied by a fisheries experiment station. From this point to the northwest end of the bay there are shoals and numerous submerged net stakes for 1 mile offshore.

For 7 miles northwesterly from Hammond Bay to **Ninemile Point (Nine Mile Point)**, and thence for 6 miles northwest to Cordwood Point, vessels should keep at least ¾ mile from shore to avoid the dangerous rocky shoals.

Hammond Bay Harbor is a harbor of refuge about 3 miles northwest of Hammond Bay and 4 miles southeast of Ninemile Point (Nine Mile Point). The harbor, formed by two detached breakwaters, is entered through a dredged entrance channel from the northwest. In 1976, the controlling depth was 12 feet in the entrance channel with 9 feet in the basin except for shoaling to 8 feet in the southwest corner. A mooring area maintained by the State of Michigan on the southeast side of the basin had a controlling depth of 6 feet in 1972.

Aids to Navigation.—Hammond Bay East Breakwater Light, 25 feet above the lake on a black column, marks the northwest end of the breakwater. Hammond Bay West Breakwater Light, 25 feet above the lake on a red column, marks the northeast end of the breakwater.

Harbor Facilities.—The Michigan State Waterways Commission completed construction in 1968 of public docking and launching facilities which provide boat slips, water electricity, lights, gasoline, restrooms, showers, sewage pumpout facilities and harbor attendant facilities. At the launching ramp is a parking lot for cars and trailers. No other services are available due to the isolated location of the harbor.

An irregular rock reef with patches of 20 to 24 feet depth extends 1¾ miles northeasterly from Cordwood Point. This reef lies about 2¾ miles southeasterly from Poe Reef Light, and in stormy weather with a heavy sea rolling, it is a menace to deep-draft vessels using the South Channel of the Straits of Mackinac. A buoy is moored on the north side of the reef.

The Straits of Mackinac, South Channel, which passes between the lower peninsula mainland and the south side of Bois Blanc Island, leads to the point of departure east of the Mackinac Bridge and is about 19½ miles long. The entrance from the east is between **Cordwood Point** and Poe Reef which is the southeast extremity of a shoal area off the southeast shore of Bois Blanc and is 2½ miles northwest of the tip of Cordwood Point.

Between Cordwood Point and Cheboygan Point, about 4½ miles to the west, there is a shallow bight and the shore line is low. However, a high bluff reaches within a mile of the shore along the easterly portion of the stretch. A tall lighted mast on the bluff about 1¼ miles southwest of Cordwood Point and a smaller mast nearby, form prominent landmarks. The shore line should be given a berth of a mile. **Cheboygan Shoal**, ¾ mile northeasterly from Cheboygan Point, has a depth of only 13 feet on its outer edge.

The mouth of the Cheboygan River and entrance to Cheboygan Harbor, is about 2 miles southwest of Cheboygan Point. **Duncan (McLeod) Bay** is about ¾ mile wide and extends about 1¼ miles southeast into the shore line under the southwest side of Cheboygan Point. The westerly point of the bay is a mile east of

the Cheboygan River. Shoal water extends out ¾ mile around Cheboygan Point and into Duncan (McLeod) Bay. A bar extends ¾ mile off the east side of Duncan (McLeod) Bay, leaving a narrow navigable channel leading northwesterly to the south channel. There are pilings from former lumber docks projecting from shore at the west-northwest edge of Duncan (McLeod) Bay. Cheboygan Crib Light is about ½ mile northeast of the river mouth.

Fourteen-Foot Shoal, a hard-gravel formation with depths of 15 to 20 feet, lies about 1 mile northwesterly off Cheboygan Point and 1⅝ miles northeast of Cheboygan Crib Light, close to the course entering Cheboygan Harbor. Fourteen-Foot Shoal Light, 51 feet above the lake, is shown from a white conical tower above a square structure, on the summit of the shoal; a fog signal is at the light. A buoy marks the north side of the shoal about 1,600 feet northwest of the light. Protective rip-rap extends horizontally out from the crib about 35 feet and should not be passed close aboard, even by vessels of shallow draft. The outer end of a shoal area having a least depth of 19 feet, hard bottom, and extending north from Cheboygan Crib Light is marked by a buoy which lies about 1¼ miles 295¼° from Fourteen-Foot Shoal Light and 1⅝ miles 001½° from Cheboygan Crib Light. Shoals with depths from 22 to 30 feet extend 1½ miles northwest of the buoy and about 1½ miles offshore. Aside from these shoals, the shore line from the Cheboygan River northwesterly for 14½ miles to Mackinaw City and thence 1½ miles northerly to the tip of Old Mackinac Point, marked by Old Mackinac Point Tower, can be approached to within ¾ mile.

Poe Reef, on the north side of the vessel passage through South Channel, is an outlying shoal extending east and west 2 miles, with least depth of 8 feet; its southeastern extremity is 3 miles southeast of the southeast point of Bois Blanc Island and nearly due south of the most easterly point of the island, the intervening waters being generally foul. Poe Reef Light, on the southerly part of the reef, is 71 feet above the water on a white and black horizontally banded square tower atop a concrete crib; a fog signal and a radiobeacon are at the light. A power cable extends from the light 151° to the shore. Protective rip-rap extends horizontally out from the crib about 30 feet and should not be passed close aboard, even by vessels of shallow draft. A nun buoy in 24 feet of water 1,100 feet 152° from the light marks shoal water extending off the lighthouse.

Bois Blanc Island, Mich., forming the north side of the South Channel, is wooded and extends 11½ miles northwesterly and southeasterly, with width of 4¾ miles at its southeasterly end and 1¼ miles at its northwesterly end. From its southeasterly point, rocky shoals extend nearly to Poe Reef. A submarine cable extends from Packard Point, the southerly tip of the island, to Cheboygan Point.

Obstruction.—A rock has been located south of Bois Blanc Island in 45°43′26.4″ N., 84°26′23.6″ W. The rock is exposed at low water datum (elevation 576.8 feet) with approximately 9 feet surrounding. The rock may constitute an obstacle to near-shore boaters.

Shelter for a limited number of small craft is available behind a rubble-mound and sheet pile breakwater located on the southerly side of the island about midway between Packard Point and **Pointe aux Pins,** the southwest angle of the island. Electricity is reported to be available at the breakwater. On the southwest side of the island, at a point about halfway between Pointe aux Pins and the northwest end of the island, **Zela Shoal,** a narrow spit with a depth of but 6 feet near its western end and rocks exposed near its midpoint at low water datum, runs 2 miles in a northwesterly direction from **Zela Point;** a buoy marks the extremity. There is no passage between this buoy and the island. The exposed rocks, covering a section about 100 feet long on the line of the shoal and projecting just above the water, are about ¾ mile northwest of Zela Point and about ½ mile west of the nearest shore line.

Due to the shoals off Cordwood Point and those off Cheboygan Point, the recommended course through the South Channel is due west from Cordwood Point to a point 2,200 feet south of Poe Reef. From this turning point, steer 5½ mile 281° to the traffic buoy moored in deep water about 2½ miles 312¼° from Fourteen-Foot Shoal Light. All vessels should leave this buoy on the port side in passing. The course then swings 302° for 14¼ miles to the turning point ½ mile east of the center of the main towers of the Mackinac Bridge between which the vessel course passes, or until Old Mackinac Point Tower bears 198°.

Charts 14886, 14881, 14880.—Cheboygan Harbor, Mich.—This harbor is about 2½ miles southwest of Cheboygan Point, and includes the reach of the Cheboygan River below a lock and dam about 1½ miles above the river mouth, and an entrance channel about 5,800 feet long in the Straits of Mackinac.

Commercial use of the harbor includes the receipt of petroleum products and coal. It also serves as a base for commercial fishermen and is used by pleasure craft. The U.S. Coast Guard Cutter Mackinaw is based here.

Channels.—The harbor is entered through a dredged entrance channel extending southwest from deep water in the Straits of Mackinac South Channel to the mouth of Cheboygan River and thence upstream for about 1.6 miles. A turning basin is on the southeast side of the channel just inside the mouth of the river. In 1976, the controlling depths were 20 feet through the entrance channel to the turning basin except for shoaling to 18 feet on the northwest limit opposite the turning basin, thence 20 feet in the turning basin except for shoaling to 18 feet on the southeast edge, thence 17 feet from the turning basin to the State Street bridge except for shoaling along the northwest edge, thence in 1974, 18 feet at the bridge decreasing to 4 feet at the locks at the head of the project. The channels are subject to shoaling.

Aids to Navigation.—Cheboygan Crib Light, 37 feet above the water atop a white octagonal tower, is on a crib on the west side of the entrance to the dredged channel. Cheboygan River Range Lights are on the west side of

the river east of Water Street, on the prolongation of the dredged channel, and form a range, bearing 212½° for passing through it. The front light on a white square tower attached to a dwelling and having a red daymark with vertical white stripe, is 45 feet above the river. The rear light, on a black skeleton tower having a slatted red daymark with vertical white stripe, is 75 feet above the river and 1,115 feet from the front light.

Three tanks and a stack are prominent landmarks at the entrance to Cheboygan River.

To enter here, continue on the west course from Poe Reef Light until the range in Cheboygan is closed, then haul sharp around and steer in on the range, passing the Cheboygan crib close-to. In approaching from the westward simply look clear of the crib light, leaving it on the right hand while hauling around onto the range.

Ferry.—A U.S. Mail boat and ferry operates between the west side of Cheboygan River above the State Street bridge and the breakwater on the south side of Bois Blanc Island. The ferry operates from about April to December depending on ice conditions. The ferry carries passengers and cargo and autos on a reservation only basis.

Harbor Facilities.—The Michigan Waterways Commission and the city of Cheboygan have provided bulkhead mooring about 800 feet long on the west bank of the Cheboygan River. A marina on the west bank of the river above the State Street bridge provides gasoline, diesel fuel, marine supplies, pump-out station, a 40-ton fixed hoist with a 12-foot vertical clearance, and marine repairs. There are coal and stone landings and two oil terminals. In 1978, launching ramps were under construction on the west side of the river, opposite the Coast Guard Dock. There is a hospital in Cheboygan.

Bridge Regulations.—See 33 U.S.C. 499, published under Certain Laws, preceding and 33 C.F.R. § 117.696 published in Rules and Regulations, preceding.

Local Harbor Regulations.—Harbor regulations have been established by the city of Cheboygan and are enforced by the harbormaster. Copies of the regulations may be obtained from the City Manager. A slow-no wake speed limit is enforced.

Lock.—Cheboygan Harbor is connected with the Inland Route (below described) by means of a river lock, reconstructed entirely of concrete in 1927, having available dimensions of 75 feet by 18 feet and a lift of about 13½ feet. The depth over the lower miter sill is about 5 feet at Lake Huron stage of Low Water Datum, and the depth over the upper miter sill is about 6½ feet when the upper pool is level with the crest of the dam. The lock is operated by the Michigan State Waterways Commission which, by statute, is authorized to prescribe reasonable regulations and fees governing the use of the lock. A small dock, about 50 feet long with a least water depth of 5 feet is presently maintained by the Waterways Commission and is located immediately downstream of the lock entrance.

Boaters proceeding upstream to use the lock are cautioned to anticipate water discharged at right angles to the stream at the power house adjacent to the Charmin Paper Company. This current commences just after a bend in the river channel to the left, and is sufficient to force a boat proceeding at reduced speed into the opposite bank. The regulations and rates of toll are as follows:

MICHIGAN STATE WATERWAYS COMMISSION CHEBOYGAN RIVER NAVIGATION LOCK

Lock Regulations

1. When approaching the lock for passage, either upbound or downbound, boatmen shall signal the lock operator with one long and two short blasts (—— — —) of the vessel's horn, siren, or whistle.
2. Vessels shall not approach closer than 50 feet of the lock structure before signaling the lock operator and, upon signaling, shall maintain that distance until advised otherwise by the lock operator.
3. All tolls must be settled before passing the lock. The toll shall be assessed upon the length of the vessel as indicated on satisfactorily documented evidence produced by the vessel owner or captain.
4. All persons using or navigating the lock or canal will be held responsible for any damages they may cause to either, or to the works or structures at the entrance to the canal.
5. No boat, float, watercraft, vessel, or material of any kind will be allowed to be moored or to remain in the lock or canal, or to obstruct the entrance to either, without the permission of the Commission or for a longer time than may be allowed by it or its agents; and in case of any violation of this regulation, the Commission may, at its option, remove such obstruction and charge the owner with the expense of the removal and care thereof, which must be fully paid or settled before such boat, watercraft, or material shall be permitted to pass the lock.

Operation Schedule

1. From April 15, to and including May 28, and from September 15, to and including October 31, the lock will be operated only between the hours of 9 a.m. and 5 p.m. on application at the Waterways Commission office located at 120 A Street, Cheboygan, Michigan. Telephone—Area Code 616, 627-9011.
2. From May 29, to and including June 14, and from the first Monday following Labor Day, to and including September 14, the lock will be operated only between the hours of 9 a.m. and 5 p.m. on application to the Commission's agent at the lock.
3. From June 15, to and including the first Sunday following Labor Day, the lock will be operated only between the hours of 9 a.m. and 9 p.m. on application to the Commission's agent at the lock.

Rates of Toll

The following rates of toll will be charged for each passage through the lock, either up or down:

1. For each recreational craft, $1.00.
2. For each commercial craft, $2.00.

Chart 14886.—Inland Route.—A series of connecting waters, comprising the Cheboygan River, Mullett Lake,

Indian River, Burt Lake, Crooked River, and Crooked Lake. in all, about 36 miles in length, and extending from Cheboygan to Conway, Mich., about 6 miles from Petoskey. It also includes Pickerel Lake which is connected by a short channel to Crooked Lake. Connection is made with Cheboygan Harbor by means of the river lock.

Each year due to fluctuations of the water surface, the Cheboygan River rises and falls about 3 feet. From day to day the level changes somewhat, due to wind and barometric pressure, such changes sometimes amounting to a foot or more, and occasionally a considerable oscillation may take place within 1 or 2 hours, amounting to 1½ feet or more.

The **Cheboygan River** is the outlet of Mullett Lake and other waters of the Inland Route, which are navigable by tugs, launches, and flat scows. The upper part of the river is separated from the lower harbor by a dam, but through navigation is accomplished by means of a small lock alongside the dam. (See descriptions of Lock and of Inland Route above.)

Above the lock, the Cheboygan River is wide and deep for 2½ miles to its junction with the Black River. Above this junction the river outside the channel is foul with stumps and snags for the remaining 2½ miles to Mullett Lake.

In 1971, the controlling depth in the channel at the head of Cheboygan River to Mullett Lake was 2½ feet.

The Black River extends southeast about 10 miles to Black Lake. The river is wide and deep for its lower 2½ miles, gradually shoaling. Above this point, the foul ground along shore widens and even shallow draft boats must use care to traverse the remaining 2¾ miles to **Alverno Dam.** A marine railway, maintained by the Consumers Power Co., provides access to the pool above the dam. The waters above the pool, including the river and Black Lake, are uncharted and rapids in the river make navigation hazardous.

Mullett Lake, drained by the Cheboygan River at its northeast end, is about 10 miles long with a greatest width of over 3 miles. The lake is generally deep, having over 100 feet in the south central portion and only 2 detached shoals, a 5-foot shoal 2 miles southwest of the head of the Cheboygan River and ¾ miles south of **Dodge Point,** and a shoal with a least depth of 3 feet which is a mile south of **Topinabee** near the south end of the lake.

Aloha State Park Boat Basin.—The Michigan Department of Natural Resources has constructed a boat basin in Mullett Lake, off Aloha State Park, that is protected by a North Jetty extending 430 feet and a South Jetty extending 330 feet lakeward from shore. The Jetties consist of stone with a cement top and are lighted at the most westerly ends.

The **Indian River** enters the southwest end of Mullett Lake. For its lower two miles, the river is about ¾ mile wide, but is mostly filled with marsh, stumps and snags with only a narrow winding channel available. The upper two miles of the river is narrow and curving and its head is in the southeast corner of Burt Lake. The village of Indian River fronts on this reach.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 16, Cheboygan county. R 281.716.2. Indian river and connected channels and canals; slow—no wake speed and high-speed boating prohibited.

2. On the waters of the Indian river and connected natural and artificial channels and canals, section 8, town 35 north, range 2 west, Koehler township; sections 5, 7, 18 and 19, town 35 north, range 2 west, and section 24, town 35 north, range 3 west, Tuscarora township, Cheboygan county:

(a) Between daybeacons 25 and 40 and between daybeacons 57 and 63, an operator of a vessel shall not:

(i) Operate such vessel at high speed, which means a speed at or above which a vessel reaches a planing condition, or

(ii) Have in tow or otherwise assist in the propulsion of a person on water skis, water sled, surfboard, or other similar contrivances.

(b) Between daybeacons 40 and 57 and between daybeacons 63 and 69, an operator of a vessel shall not exceed a slow—no wake speed, * * *

Burt Lake is about 10 miles long north and south and has a maximum width near its center of 4 miles. It has depths up to 50 feet and no detached shoals. The mouth of the Crooked River is near the center of its westerly side.

The **Crooked River** extends southwesterly from Burt Lake following a twisting course for about 5 miles through marshy ground to the north side of the easterly end of Crooked Lake. **Alanson** is located on the river about ½ mile below the lake.

Bridge Regulations.—See U.S.C. 499, published in Certain Laws, preceding, and 33 C.F.R. § 117.692 of Rules and Regulations, preceding.

Navigation Lock.—A navigation lock and dam, completed in Mar. 1968, have been constructed on the Crooked River at Alanson, Mich. The lock is 17 feet 10 inches wide and 66 feet long. See Navigation Regulations for operating schedule.

Navigation Regulations.—See 33 U.S.C. 1, published in Certain Laws, preceding, and 33 C.F.R. § 207.476 of Rules and Regulations, preceding.

Crooked Lake has an overall length from east to west of about 4 miles, is roughly triangular with narrows at each end, and a width of almost 2 miles at its center. **Oden Island,** just east of the center, extends almost across the lake leaving a narrow channel along its north side. The village of **Oden, Mich.** is on the north shore of the lake, northwest of Oden Island.

Overland Trailer Service.—Completing the inland route between Lake Huron and Lake Michigan, a portage service is available at the Windjammer Marina about 1 mile west of the village of Oden. Transportation in either direction can be arranged for trailerable craft up to 25 feet in length and less than 5,000 pounds gross weight between Crooked Lake and Little Traverse Bay on Lake Michigan, a distance of about 8 miles. An advance notice of 24 hours is requested. Information on fees and reservations may be obtained by telephone or by writing to:

Windjammer Marina, Inc., Oden, Mich. 49764, telephone (616) 347-3918.

Conway, Mich., is a small community at the westerly end of Crooked Lake and is the limit of navigable water through this inland route. There is no navigable water for any type of small craft between Conway and Little Traverse Bay. The **Pickerel Channel** leads from the south side of the easterly end of Crooked Lake and extends southeast about ½ mile to Pickerel Lake.

Pickerel Lake extends southeasterly for about 2½ miles with a greatest width of less than a mile.

In 1976, the controlling depths in the Inland Route were 3 feet in Indian River between Mullett Lake and Burt Lake, 2 feet in Crooked River from Burt Lake to Alanson, and ½ foot from Alanson to Crooked Lake. In 1972, the controlling depth in Pickerel Channel was 3 feet.

Approximately 1,200 linear feet of type Z steel sheet piling jetties had been placed in Burt Lake at the entrance of Indian River with a cluster of three bumper piles at the end of each jetty.

Aids to Navigation.—A series of day beacons and buoys have been placed along the navigation channel in the Indian, Crooked, and Cheboygan Rivers. Lights or buoys are located at the mouth and head of the Indian River; in Burt Lake at the entrance of the Crooked River Channel; and two in Crooked Lake, one at the entrance of Pickerel Channel, and one at the entrance of the River Channel. Although the channels are well marked, some aids are usually destroyed each winter by ice and it is necessary to follow a current navigation chart and consult the latest Notices to Mariners for recent changes.

Harbor Facilities.—There are marinas on the upper Cheboygan River, near the north end of Mullet Lake, on Burt Lake and on the Indian River in the village of Indian River, at Alanson, and near Oden on the north shore of Crooked Lake. Most of the facilities required for operation and repair of boats are available at these marinas. No facilities exist along the Black River or Pickerel Lake.

Bridge Regulations.—See **33 U.S.C. 499,** published under Certain Laws, preceding, and 33 C.F.R. § 117.696 published in Rules and Regulations, preceding.

Bridges, etc., Across Inland Route

No.	Location and name	Kind	Miles above Lake Huron	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Cheboygan River								
1	State Street U.S. 23	Highway	0. 92			60	9. 7		Bascule. See Bridge Regulations. preceding.
2	Lincoln Avenue	do	1. 88			81	16. 0		Fixed. Being removed. New bridge under construction.
3	M-33 New	do	4. 13			58	16. 7	15. 7	Fixed.
4	Detroit & Mackinac RR.	Railroad	4. 16			110	21. 1		Fixed.
	Indian River								
5	Interstate 75	Highway	17. 48			53. 3	15. 6		Fixed.
6	New York Central RR.	Railroad	18. 35			79	18. 5		Fixed.
7	U.S.-27	Highway	18. 36			70	14. 7		Fixed.
	Crooked River								
7A	Aerial cable	Electric	26. 73				18. 0		
7B	Submerged pipeline	Gas	27. 10						
8	M-68	Highway	29. 35			60	16. 0		Fixed.
9	Alanson, Village of	do	29. 60			21. 5	5. 5		Swing. See Bridge Regulations below.
10	Alanson Lock		29. 98			17. 8	15. 6		

Navigation Regulations.—See 33 U.S.C. 410, published in Certain Laws, preceding, and 33 C.F.R. § 207.490 of Rules and Regulations, preceding.

Charts 14880, 14881—Mackinaw City, Mich.—A village and railroad terminus located on Old Mackinac Point, the most northerly point of the Lower Peninsula of Michigan. The Mackinac Bridge, connecting this point and Point St. Ignace about 4 miles to the north, is described under Lake Michigan. A water tank, radio tower, and the abandoned Old Mackinac Point Lighthouse are prominent landmarks. Railway car ferries operate to St. Ignace throughout the year to connect with the Upper Peninsula. The railroad pier is located on the east side of the point about ⅝ mile from the lighthouse. It extends about 1,250 feet east from shore and is protected from winds from the northwest through west to southwest. (See also under Lake Michigan.)

Channels.—A breakwater extending northward from the end of the railroad pier and a combination breakwater and dock extending from shore on the north side of the railroad pier enclose the harbor basin which is entered from northward. In 1976, the controlling depth was 10 feet in the entrance channel.

The State of Michigan has a landing dock located about 700 feet south of the railroad pier and extending about 1,400 feet from shore to a natural depth of about 17 feet. A maneuvering area has been dredged off the end of the dock and affords depths of 19 and 20 feet, except for shoal areas with a least depth of 17 feet.

About 1,650 feet south of the State dock is a rubble mound pier extending east about 600 feet from shore. In 1966, there was 6 feet off the outer end of the pier. This dock is used by a ferry line operating to Mackinac Island.

Aids to Navigation.—An air diaphragm foghorn is maintained by the Mackinac Transportation Co. on the end of the railroad pier. The horn is directed northeasterly and operates throughout the year during foggy weather.

Harbor Facilities.—The village and the Michigan State Waterways Commission have jointly constructed public docking and launching facilities in the basin north of the railroad pier. Water, electricity, lights, restrooms, showers, gasoline and oil, sewage pumpout facilities, a boat ramp maintained by the village in the northwest corner of the basin, and harbor attendant services are available. A 20-ton hoist and marine repair services are offered in the harbor by private enterprise. Restaurants and stores are nearby. An oil terminal is south of the marina.

Ferry.—A passenger ferry operates between Mackinaw City and Mackinac Island Harbor from May to October.

Obstructing Cribs.—The old city dock, about 1,200 feet north of the railroad pier, is in ruins and submerged. Two or three of the outer cribs, about 600 feet offshore, are within 3 or 4 feet of the lake surface and should be avoided.

Ruins of another dock, about 200 feet south of the railroad pier, extend about 600 feet offshore with less than 1 foot of water over some portions.

The **Straits of Mackinac** connect Lake Huron and Lake Michigan. From the north side of Bois Blanc Island, the straits lead westward through Round Island Passage between Round Island and Mackinac Island, thence between Old Mackinac Point on the lower peninsula and Point St. Igance on the upper peninsula to Lake Michigan.

Spectacle Reef lies 10½ miles east of the east point of Bois Blanc Island; it is about ⅞ mile long north and south, and has a least depth of 5 feet on its south end. At the northwestern edge is Spectacle Reef Light, 86 feet above the lake on a grey conical tower mounted on a square pier and serving as a guide for vessels bound from the southward and eastward to the channel north of Bois Blanc Island, or from De Tour to the South Channel; a fog horn operates at the light.

Raynolds Reef is about 1½ miles long east and west, with depths of 11 to 20 feet; its eastern end is about 3 miles westerly from Spectacle Reef Light and is marked by a buoy. The west end of the reef is also marked by a buoy.

Bois Blanc Light, 42 feet above the lake on a white skeleton tower, is on the northeast point of the narrow neck of land extending northward near the easterly end of Bois Blanc Island, and is a guide into the north channel of the Straits. There is a dangerous spit with a depth of 15 feet extending to ⅞ mile northwest of Bois Blanc Light.

Round Island, small and hilly, lies just off the northwestern end of Bois Blanc Island, with which it is connected by very shallow water. Shoal water extends north from Round Island, its outer limit being marked by the buoys on the southerly line of Round Island Passage. An old lighthouse tower is located on the northwest tip of the island.

Round Island Passage, Mich.—The dredged channel between Round Island and Mackinac Island had a controlling depth of 28 feet in July 1978. The southerly edge of the channel is marked by two black lighted buoys. The northerly side of the passage is defined by Buoy 2 off Mission Point, and Round Island Passage Light. Round Island Passage Light, located about 535 feet southwesterly from the end of Biddle Point breakwater, is 71 feet above the water in an octagonal tower mounted on a square white concrete base; an air diaphragm and a 322 kHz marker radiobeacom are operated at the light station.

Mackinac Island, Mich. is a resort community situated with its southeasterly end about ⅝ mile north of Round Island and thence it extends northwesterly 3 miles, with a maximum width, midway of its length, of 1⅞ miles. The island is very bold, and its shores are generally rocky and deep-to. A detached shoal about 500 feet in diameter, with least depth of about 16 feet, rising abruptly in 70 feet or more of water, is located about 11,000 feet northerly from the southeasterly bluff point of Mackinac Island and about 1⅓ miles from the nearest shore at about midlength of the northeasterly face of the island; the bottom is very irregular with numerous large boulders.

Mackinac Island Harbor, Mich.—The city of Mackinac Island is located on the shores of the semicircular bay in the southeast end of the island, opening toward the south-

east between **Biddle Point** on the west and **Mission Point** on the east, and having an area of about 34 acres. A water tank northwest of the harbor entrance and a church spire north of the harbor entrance are prominent. The Union Terminal Piers on the northwest side of the harbor comprise a passenger dock, 700 feet long, and a coal dock, 400 feet long, to the southwest of the preceding. The available depths in 1969 were 13 feet at the end of the passenger dock and 11 feet at the end of the coal dock, shoaling toward shore. The harbor is partially protected by a breakwater extending south from Mission Point and by a detached breakwater extending southeast from off Biddle Point, and while also protected by Mackinac and Round Islands from northerly and southerly winds, the harbor is subjected to quite heavy seas through the Straits when the wind has an easterly or westerly direction.

Aids to Navigation.—West Breakwater Light 1, on the outer end of the breakwater, is 16 feet above the water on a white skeleton tower. Coal Dock Pierhead Light, on the most southerly dock on the west side of the harbor, is 14 feet above the water on a white mast, and is located at the outer end of the coal dock. Passenger Pierhead Light about 150 feet north of the coal dock, is 20 feet above the water on a white mast located at the outer end of the passenger dock and a hand fog bell is operated at the light. Mackinac Island East Breakwater Light 2, 25 feet above the water on a white pole, is located on the south end of the Mackinac Island extended east breakwater off Mission Point. Buoy 2 is moored about 2,700 feet north easterly from the south end of Mission Point breakwater and marks the southeasterly edge of the shoal bank off the point.

Ferries.—Passenger ferries operate between Mackinac Island Harbor and Mackinaw City from May to October and between Mackinac Island Harbor and St. Ignace from April to December, ice conditions permitting.

Harbor Facilities.—The Michigan State Waterways Commission has constructed a pier on the north side of the harbor, for the use of yachts and small pleasure boats, with an available depth of 14 feet at the outer end. This facility can accommodate 100 watercraft and provides electric and water services as well as area lighting. Sewage pump-out facilities and toilet and shower accommodations are also provided. Charter air service is available between the island and Cheboygan, Bois Blanc Island, Drummond Island, and Pellston, Michigan.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake is located approximately 1,000 feet offshore, 4,000 feet northwest of Round Island Light. It is not marked.

Wreck.—The 588-foot limestone freighter, **Cedarville**, sank in the South Channel of the Straits of Mackinac on May 7, 1965. Investigation in 1974 indicated a least depth of 32 feet over the highest part of the ship. A buoy is located about 16,950 feet 120° from the south tower of the Mackinac bridge and about 90 feet north of the wreck.

Majors Shoal, a dangerous rocky reef, 1,300 feet long east and west with least depth of 11 feet, lies 2⅝ miles southwest from Round Island Passage Light, to southward of the vessel course from that light to the turning point ½ mile east of the center of the main towers of the Mackinac Bridge between which the vessel course passes, or until Old Mackinac Point Tower bears 198°. It is marked at its westerly end by a buoy and by a buoy in 20 feet of water near its easterly end.

Submerged Cribs.—Submerged dock ruins extending approximately 210 feet offshore have been reported in 1971 on the south side of Graham Point about 1.3 miles 307° from North Graham Shoal Lighted Bell Buoy 3.

North and South Graham Shoals.—South Graham Shoal, 3,120 feet by 2,130 feet in size on the 20-foot contour and with least depth of 2 feet, lies 1½ miles southerly from **Graham Point**, and is marked on its southerly edge by a buoy. North Graham Shoal, 4,270 feet long by 1,480 feet in maximum width on the 20-foot contour and with least depth of 4½ feet, lies ¾ mile southerly from Graham Point, and is marked on its east end by a buoy. The summits of the shoals lie ¾ mile apart in a northeast and southwest direction, but there are detached shoals with 15 to 20 feet depth between the two. There is a well-defined channel between the shoals and the mainland, which can be run on the range between McGulpin Point and the north tangent of Mackinac Island; its clear width between 18-foot contours is 1,000 feet. The currents in the vicinity of the Graham Shoals and the Straits are often strong and irregular; after fresh gales, anchored vessels frequently trend to windward.

Section V.—North Shore from Graham Point, Mich., to Mississagi Strait, Ontario

St. Ignace, Mich.—St. Ignace is a resort community and ferry and railway terminal point located in **East Moran Bay**, opening to the east on the northerly side of Graham Point. Several docks, some marked by private lights, extend out to deep water in the Straits. The Mackinaw Transportation Co. operates car ferries throughout the year, connecting traffic of the Soo Line Railroad at St. Ignace with the Michigan Northern and Detroit and Mackinac Railway Companies at Mackinaw City.

The Michigan State Waterways Commission operates two docks north of the railway dock. The dock immediately adjacent and north of the railway dock and known as Dock 2, is marked with St. Ignace State Pier Light at the outer end and also provides a breakwater with 25 protected moorings for recreational craft. In August 1978, depths of 6 feet were reported alongside. Water, electricity, gasoline, sewage pump-out facilities, and harbor attendant services are available. Marine supplies are available nearby. The breakwater, which extends southerly at right angles to the main dock and is located approximately 700 feet shoreward of the main dock, has a private light at its outer end. A series of buoys is located in four feet of water west of the breakwater. On the eastern tip of Graham Point, the State of Michigan built two new ferry docks which are not being used. The two docks

are approximately 460 feet long and the area between has been dredged to 22 feet. There is a loading slip adjacent to the south side of the north dock, and another loading slip along the northside of the south dock. A second slip, dredged to 20 feet, exists on the outside of each of the docks.

Coast Guard Station.—St. Ignace Coast Guard Station is located near the Michigan Department of State Highways dock on the easterly end of Graham Point.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake is located 1,300 feet northwest of the St. Ignace Coast Guard Station. The pipeline extends easterly 500 feet to a crib with 14 feet over. It is not marked.

Rabbit Back Peak is a bold headland jutting out about 4½ miles north of Graham Point. From it, shoal water extends to the southeast ½ mile, and the bight under its south side is shallow to ¾ mile offshore. Between Rabbit Back Peak and Grosse Point, 4 miles northerly, shoals make out ⅞ mile in the north portion of the bay formed between the two points. Grosse Point should be given a berth of ½ mile.

St. Martin Bay, about 7 miles north of Mackinac Island, is marked by **Grosse Point** at its west entrance, and by **St. Martin Point** 7¼ miles east, with the two **St. Martin Islands** dividing its mouth into three wide and deep passages. Inside the line of the entrance points the bay extends northward from 3½ to 5½ miles, having depths of 24 feet to within 1 mile or less of the shore, except in the northwest portion, where sandy flats extend off 1½ miles between the mouths of the **Carp** and **Pine Rivers,** and also in the northeast corner, where the offshore bank is 1¼ miles in extent.

Big St. Martin Island, 2 miles east of Grosse Point, is 1¾ miles long north and south, with a maximum width of 1⅜ miles, and from its shores shoals extend an average distance of ½ mile. St. Martin Island, 1½ miles east of Big St. Martin Island and the same distance southwesterly from St. Martin Point, is about 1 mile in diameter. Deep water approaches to within 1,000 feet of its shores except on the south, where a bank and **St. Martin Shoal,** of rock formation and with depths of 3 to 10 feet, reach 1⅛ miles southward. **St. Martin Point Reef,** running 1⅛ miles east and west and having rocks nearly awash, lies with its outer edge ⅞ mile south of St. Martin Point; the maximum depth between the point and reef is about 18 feet.

Between St. Martin Point and **Brulee Point** is **Search Bay,** 2 miles long and 1½ miles wide, shoal for ¾ mile from its head and for about ⅜ mile from the shores in the outer portion.

Goose Island lies with its north end 3¼ miles southeasterly from **Brulee Point**; it is about 3,500 feet long and 500 feet or less in width. The island is the outcropping of a very shallow rocky bank 1¾ miles long and ⅞ mile wide, which extends 1 mile southeasterly from the south end of the island; the bank at its north end is 1⅝ miles southwest of the adjacent shore of **Marquette Island** of the Les Cheneaux group. **Goose Island Shoal** is a dangerous detached reef lying 3 miles southwest of Goose Island, and having a least depth of 2 feet; it is about 1 mile long from its southeasterly end, marked by a buoy, to its northwesterly end, which is marked by a lighted buoy.

CHART NO. 14880, STRAITS OF MACKINAC; COAST CHART NO. 14881; CHART NO. 14885, LES CHENEAUX ISLANDS; CHART NO. 14882, ST. MARYS RIVER

Charts 14880, 14881, 14885.—Les Cheneaux Islands comprise an extensive group filling the coast for about 15 miles eastward from Brulee Point. The islands and their neighboring shoals, as well as the numerous points jutting among them from the irregular mainland coast, have a characteristic trend from northwest to southeast. The many inlets and channels thus formed have considerable deep water, but are so obstructed by banks and detached shoals as to be practically impassable except by small craft.

Channels.—A small-craft channel has been dredged on the north sides of Marquette and La Salle Islands with Middle Entrance channel between them. In 1973–1977, the controlling depth was 7 feet in the project except for 6 feet in Middle Entrance channel.

The main channels through the islands are well marked by U.S. Coast Guard buoys, both lighted and unlighted. These extend from Point Brulee shoal, at the West entrance, to **Penny Island** shoal on the East entrance **Scammons Harbor.** Scammons Harbor contains good deep water. Isle Isidore light is privately maintained on the South end of Island No. 8.

The towns of **Hessel** and **Cedarville** are located on the main shore of Les Cheneaux Islands, with docks accommodating craft of light draft.

At Hessel, the Michigan State Waterways Commission together with local agencies, has provided broadside mooring for recreational craft at a steel crib breakwater about 400 feet long. The breakwater is located immediately south of the Post Office. Water, electricity, and a launching ramp are available. A boatyard immediately eastward of the breakwater provides gasoline, marine supplies, a 12-ton hoist capable of hauling out craft up to 42 feet, hull and engine repairs, and minor electrical repairs.

Cedarville, about 3¼ miles east of Hessel, has limited small-craft facilities. A marina ¾ mile south of town has water, electricity, marine supplies, a pump-out station, launching ramp, a 50-ton lift capable of hauling out 60-foot craft with a 18-foot beam, and hull and engine repairs.

The Les Cheneaux Islands Association maintains Uniform State Waterways Marking System buoys between Point Brulee on the west and Rover Island on the east (Prentiss Bay). These buoys mark hazards to shallow draft vessels such as rocks and shoals. The number set out each year depends on existing water levels. Several of these buoys mark secondary channels used chiefly by local boatmen.

In addition to the above mentioned buoys several private lights are also maintained.

Port Dolomite, Mich., located on the north side of the entrance to **McKay Bay,** about 3¼ miles east of

Cedarville, Mich., is a private dock of the U.S. Steel Corp., Cedarville Plant, Limestone Operations. The owners have dredged a channel 1,900 feet long, 200 feet wide and 27 feet deep extending from deep water in a northwesterly direction to the lakeward side of the dock. The L-shaped dock has a 600-foot main arm parallel to the shore to which it is connected at its northwest end by an inner arm about 400 feet long and perpendicular to the shore. A range of lights mounted on the dock marks the inner portion of the approach channel. Ships moor along the southwest face of the dock. Soundings taken in June 1969 indicated a controlling depth of 29 feet along the face of the dock. Along the approach there is Crow Island, a small island, and a number of reefs, including a shoal approximately 1,000 feet by 300 feet with a depth of about 14 feet of water about 800 feet 180° from McKay Bay Range Front Light.

Crow Island, Surveyors Reef, and Pomeroy Reef.—Crow Island, with surrounding shoal water extending over ½ mile, lies about 2 miles southeasterly from Port Dolomite. Crow Island Leading Light is on the northwestern end of Crow Island 10,050 feet 121° from McKay Bay Range Front Light. A narrow unnamed reef extending about ½ mile northwest-southeast with a least depth of 10 feet lies about ½ mile southwesterly from Crow Island; the southeasterly side of this reef is marked by a buoy. About 1 mile southeasterly from Crow Island is Surveyors Reef, which has a least depth of only 1 foot; a buoy is located off the northwesterly side of this shoal. Pomeroy Reef, which is about ¾ mile in length and ¼ mile wide, has a least depth of 12 feet and lies 3½ miles 149° from Crow Island and 2¾ miles 287° from Martin Reef Light, Pomeroy Reef Lighted Gong Buoy is located about ¼ mile westerly from the reef and marks the haul point for vessels bound for Port Dolomite.

Tobin Reef, with a least depth of 2 feet, and several other detached shoals, lie between the above described island and reefs and Martin Reef. Although there is good water between these shoals, persons not familiar with the locality should not attempt to navigate between them.

Charts 14880, 14881, 14882.—Martin Reef, with its southeasterly or outer extremity situated 4 miles southeasterly from Beaver Tail Point, easterly end of Les Cheneaux Islands, is a rocky shoal with patches having depths of 1 to 15 feet. This reef is a menace to navigation, as it lies near the track of vessels from **De Tour Passage** to Mackinac Island. Martin Reef Light is on the southeasterly part of the reef and a foghorn sounds continuously. The base of the light structure is surrounded by protective rip-rap extending horizontally out from the structure about 15 feet and should not be passed close aboard even by vessels of shallow draft.

Between **Beaver Tail Point** and Point De Tour, 12½ miles eastward, there are numerous outlying shoal patches, and the coast should not be approached within 1¼ miles. **Beaver Tail Reef** lies 1⅛ miles southeasterly from Beaver Tail Point and about 1 mile from the shore to northward. From **St. Vital Point,** 4 miles west of Point De Tour, shallow water makes out easterly ⅝ mile into **St. Vital Bay,** and about the same distance southerly from the northeast point of the bay; between these two banks there is deep water to within ½ mile of the head of the bay. An 11-foot spot lies ½ mile southwest of Point De Tour, and an outlying detached shoal with 15 feet least depth is located 2⅛ miles southwesterly from Point De Tour.

De Tour Reef, a rocky shoal with a depth of 15 feet, lies about 3,500 feet southeast from **Point De Tour.** De Tour Reef Light, with red sector covering shoals to the west and north, is located at the southeast side of this reef and marks the west side of the entrance to De Tour Passage, St. Marys River. A fog horn at the lighthouse has the following characteristics: blast 3 seconds, silent 3 seconds, blast 3 seconds, silent 51 seconds for all conditions of reduced visibility at De Tour Reef. A radiobeacon is operated at the light station.

Crab Island Shoal is a detached reef, 1,500 feet south of **Crab Island** (off **Barbed Point** of Drummond Island), running southeasterly and northwesterly ⅜ mile, with a number of boulders, one nearly exposed. Its western end is marked by a buoy which indicates the east line of the channel into De Tour Passage. There is 30 feet of water in the channel passing the shoal.

Charts 14880, 14882.—Drummond Island, Mich., constituting the most easterly part of the upper peninsula of Michigan, extends from De Tour Passage nearly 20 miles easterly to False Detour Channel, with a maximum width of about 12 miles north and south. Its south shore fronts on Lake Huron, its northeasterly shore on North Channel, and its northwest shore is indented by Potagannissing Bay.

A dock 800 feet long constructed along shore partially on the hull of the Steamer **Oglesby,** on the west shore of Drummond Island about 1½ miles north of Crab Island, is maintained by Drummond Dolomite, Inc. Depths of 23 feet are available at the dock. The deck height is about 10 feet. Care must be taken when approaching or leaving the dock to avoid shoaler water to north and south marked at the limits with buoys.

Potagannissing Bay is a wide and deep passageway between Drummond Island and St. Joseph Island, Ontario, and connecting the eastern end of North Channel with the St. Mary's River immediately north of De Tour Passage. Its waters are, however, obstructed by several scores of islands and many shoals making up abruptly from deep water.

Drummond, Mich., on the south side of the bay, has a sawmill and limestone quarries. A marina has gasoline, diesel fuel, water, electricity, marine supplies, pump-out station, launching ramp, 12-ton fixed hoist capable of hauling out 40-foot craft with a 10-foot beam, and hull and engine repairs.

The Northeast Coast of Drummond Island on the North Channel side, is generally deep-to, except in the vicinity of **Shoal Point,** where **Humphrey Rock** with 9 feet and **Lindsay Bank** with 11 feet, least depths, lie ¾ mile out. **Glen Cove** and **Sitgreaves Bay,** indentations between **Shoal Point** and **Marble Head,** afford in southerly and westerly winds good anchorage in 4 fathoms of water and upward,

with mud and clay bottom. Marble Head, the highest point on the island, is located at the western entrance to False Detour Channel from North Channel.

The South Coast of Drummond Island is decidedly broken, and is marked by many indentations and outlying islands and shoals. From west to east the largest bays are Whitney Bay, Island Harbor, Huron Bay, and Big Shoal Cove; these are natural harbors having from 24 to 40 feet of water, with clay and rock bottom. Owing to the numerous obstructions these bays should not be entered in foggy weather or without charts and proper local knowledge.

Whitney Bay is inclosed from the lake by a number of islands, with deep channels between the islands in the westerly side of the mouth of the bay. In the approach outside of the islands there are several detached reefs surrounded by deep water. Three of these lie in a southwest direction from **Garden Island** at the easterly entrance to the bay. The outer rock, with a depth of only 7 feet, is about 1¼ miles southwest of Garden Island and nearly on a line with the southwest end of Espanore Island and Point De Tour; it is marked by a buoy in 18 feet of water on its southwest side. A 12-foot spot lies 2,000 feet northwest of the outer shoal. The middle reef is awash and lies about 2,000 feet south of **Bellevue Island**. The inner reef lies with its northerly end, on which there are very shallow boulders, about 500 feet off the southwestern end of Garden Island; there is a 36-foot channel between this reef and Garden Island.

A marina, about 1⅛ miles north of Garden Island on the east side of Whitney Bay, had depths of 6 to 9 feet reported alongside in August 1978. The marina has gasoline, water, electricity, a launching ramp, a 4-ton fixed hoist, and hull and engine repairs.

A detached 4-foot reef, with scattering bolders, lies about 1 mile northwesterly from the southwest point of Espanore Island and in line with that point and Barbed Point. There is a 13-foot spot between this reef and the **southwest point of Espanore Island**. Rocky ledges and boulders extend ½ mile south from Espanore Island.

Island Harbor.—A patch of rocks ½ mile in width from north to south, with depths of 1 or 2 feet and with scattered boulders, extends ½ mile east from the northeast end of Espanore Island, narrowing the entrance into Island Harbor to a width of 1,200 feet. The islands in the head of this harbor are surrounded by shoals, and a detached 14-foot spot lies in the deep area about 1,200 feet northeasterly of the north point of Espanore Island.

Huron Bay.—From **Gravel Island**, near the middle of the entrance of Huron Bay, rocky spots with depths of 1 to 12 feet extend ½ mile in a southerly direction. There is a narrow channel of deep water about halfway between the island and the west bay shore. Eastward from the island ½ mile there are rocky ledges with depths of 4 to 12 feet, extending south in line with the rocky east shore of Huron Bay to a point ¼ mile farther south than the south end of Gravel Island. The passage into the bay between the island and the ledges is deep for a width of ⅝ mile.

Between Huron Bay and Big Shoal Cove, rocky shallows skirt the irregular shore line for an average distance of ½ mile off. However, there are three outlying shoals off this shore. **Holdridge Shoal**, southeasterly off Huron Bay and 1⅛ miles from the adjacent shore of Drummond Island, is a narrow boulder reef about ⅜ mile long north and south on the 18-foot contour, with a least depth of 5 feet near the south end.

Southwesterly from the south point of **Meade Island**, which lies in the mouth of **Scammon Cove**, there are two detached reefs covered with boulders. **Horseshoe Reef**, the outer reef, 1½ miles from Meade Island and with its southerly limits 1¼ miles from the shore to the north, is awash and in the shape of a horseshoe; its extent north and south is ½ mile, and its width ⅜ mile across the two parallel ledges. The inner reef, ½ mile from Meade Island and with its south edge ⅞ mile from the point of shore to its north, is ⅝ mile long northwest and southeast and ⅓ mile across and covered by shallow boulders. A 13-foot spit extends south from the shore to within ¼ mile of the north end of the outer reef, and the inner reef is detached from the offshore bank by about ⅛ mile of deep water.

Big Shoal Cove.—South of **Scammon Point**, two detached 4-foot and 11-foot reefs, at distances of ⅜ and ½ mile, respectively, form dangerous obstructions in entering Big Shoal Cove. From the south point of the east shore of Big Shoal Cove, rocky spits with very scant water extend in a southwesterly direction 1½ miles, expanding at the outer end into a broad ledge extending in a northeast and southwest direction for 1⅛ miles. Big Shoal Cove has 24 to 30 feet of water and fine holding ground in clay.

Chart 14880.—Between Big Shoal Cove and **False Detour Channel** the shore should be given a berth of 1½ miles to avoid the spits above mentioned and other detached shoals. An 11-foot rocky spot lies ¾ mile southwest of the southwest entrance point of False Detour Channel. A sharp lookout must be kept for this spot in entering the channel from the westward.

The International Boundary between the United States and Canada passes through False Detour Channel and around Drummond Island on the north through the North Channel and around the south side of St. Josephs Island into the St. Marys River.

Chart 14860.—Cockburn Island, Ontario.—This island, lying between False Detour Channel on the west and Mississagi Strait on the east, is about 10 miles in diameter and easily distinguished by a broad and partly cleared eminence called McQuaig's Hill, 480 feet high, situated 2.8 miles back from the village of Cockburn Island, north side of the island.

The North Coast of the Island may be considered free from dangers, there being nothing farther from the shore than a stranger would naturally keep. **Channel Point**, the northeast extremity and the west entrance point of Mississagi Strait from North Channel, is gradually rounding and steep-to.

At the village of Cockburn Island, also known as **Tolsmaville**, there are two landings. The old Government wharf, with a warehouse thereon and a loading platform 24 feet in length projecting from the eastern side, extends

northerly 500 feet from shore, with a depth of 16 feet at the outer end, which is marked by Cockburn Island Light. The western side of this wharf is preferable as a berth; in approaching, vessels should keep well out in deep water until the wharf is end on and then steer directly for it. Considerable sea is felt at this wharf in a northerly gale. The new Government breakwater, about 500 feet east of the old wharf, extends northeasterly about 449 feet from shore and thence easterly about 87 feet; there is 17 feet depth at the outer end. A light, 21 feet above high water, is situated on the outer end of the breakwater. In approaching, vessels should keep well out in deep water until the eastern end of the breakwater bears south, and then proceed with not more than 14 feet draft to the end of the breakwater and tie up on either side. The south side affords a safe berth in any storm. A spar marks the edge of a channel with 17 feet least depth leading to the inner harbor east of the town wharf. A bank extends 600 feet offshore at **Ross Point**, immediately eastward of the village.

Vessels running out of Lake Huron in heavy weather find anchorage in 40 to 50 feet over sand and mud in **Tolsma Bay**, ½ mile northwest of the public wharf.

Thompson Point, the most northerly projection on Cockburn Island, is low and wooded and may be approached within 500 feet. Foul ground extends eastward from Thompson Point, with rocky patches of 17 or 18 feet, the outer one being ½ mile offshore. **Monk Point**, marked with a light shown from a 20-foot pipe tower, is situated 2⅓ miles westward of Thompson Point, and may be considered the eastern entrance point to **False Detour passage** from North Channel; a flat extends off 900 feet around the point.

In False Detour Channel, the only known obstructions along the west shore of Cockburn Island are at the southeasterly entrance from Lake Huron. **Wheeler Reef** (rock 5 feet above water), at this entrance, extends ½ mile northwest and southeast; it is ½ mile off the southwesterly side of **Kitchener Island**, and there is a 20-foot channel between the reef and the island. From the north end of Kitchener Island, shoals extend northwesterly 1,200 feet into the channel. There is a good anchorage in 24 to 30 feet northeast of Kitchener Island, between it and **Herschell Island**, with protection from all winds.

Wagosh Bay, opening between **Smith Point** and **Pulpwood Point** at the westerly end of the south shore, is 2 miles wide at its entrance, from which line it extends northerly 1½ miles. Avoiding the obstructions mentioned below, it affords excellent anchorage in 4 to 6 fathoms, mud and sand bottom, and protection from all but south and southeast winds. The west shore of the bay should not be approached within ⅝ mile. **Wagosh Reef** extends from the head of the bay in a southerly direction for 1¼ miles, about to the line of the entrance points; it has a depth of only 8 feet near its southerly end and should be carefully avoided. **McKay Rock** is a detached reef with a depth of 11 feet, lying 1 mile southeasterly from the end of Wagosh Reef and ¾ mile southwesterly from Pulpwood Point.

There are no obstructions beyond ¼ mile from the south shore between Pulpwood Point and **Boom Point**, the most southerly projection of the island.

Entering Mississagi Strait from the southwest, the Magnetic Reefs and other shoals northeast of them should be avoided. Magnetic Reefs are distinct groups of reefs lying southeasterly off **Boom Point**, separated by crooked channels which are not recommended. The inner or West Reef is 1 mile southeast of Boom Point and has a least depth of 4 feet. **Middle Reef**, with a least depth of 5 feet, lies 1⅜ miles southeasterly from Boom Point. **East Reef**, the largest of the group, is just dry in one spot and extends 1 mile in a northerly and southerly direction; it is 2¼ miles from Boom Point between 090° and 118°. **South Reef**, the most dangerous, with least depth of 7 feet, is an extension of Middle Reef and lies southerly for 1½ miles, or to a point 2 miles southeast of Boom Point. There is a narrow passage of 14 feet depth between the West and Middle Reefs. A channel 1,000 feet wide, running in a north and south direction, with 18 to 30 feet of water, lies between the easterly edges of Middle and South Reefs and the westerly edge of East Reef. **North Rock** is a detached rock with 3 feet depth, lying ¾ mile north of Middle Reef and ½ mile offshore. **Castilian Shoal**, with a depth of 4 feet, lying 1⅛ miles southeast of Magnetic Island, is another dangerous reef at the west entrance of Mississagi Strait. The easterly shore of the island thence to **Cinder Point** should be given a berth of ¾ mile, but between Cinder and Channel Points the coast is deep-to.

Section VI.—Manitoulin Island, Ontario, and Entrances to Georgian Bay thence to Cape Hurd

Charts of Canadian waters are prepared by the Canadian Hydrographic Service, Department of the Environment, Ottawa, Canada

Chart 14860.—Manitoulin Island, Ontario, is about 80 miles long east and west and has a general width, on headland cross-sections, which increases from about 6 miles at its west end to about 30 miles near its east end, but the width in places is contracted to less than 3 miles by large bays lying within lines joining its headlands. Its south or Lake Huron coast extends from Mississagi Strait southeasterly to the Owen Channel entrance to Georgian Bay, its east shore fronts on Georgian Bay, and its deeply indented north face forms the major part of the south shore of the North Channel.

In Mississagi Strait, the rounding west end of Manitoulin Island is bold and deep-to. Mississagi Strait Light is on the west end of the island, at the east side of the southerly entrance to the strait, and is a guide to vessels bound through in either direction. There is good shelter along either shore of the strait after passing to the north of the light, bottom sand and mud.

The South Coast of Manitoulin Island is characterized by a succession of rocky offshore banks and detached reefs. The **Duck Islands**, five in number, with shoals adjacent thereto, extend 13¾ miles south from Manitoulin Island near its western end. There are a number of bays along this shore, in which good anchorage may be found. Details of the south coast are given below.

Carter Rock, awash, is on the north end of a detached reef at the eastern entrance to Mississagi Strait, 1¼ miles southwesterly of **Lynn Point. Purvis Bank,** very shallow, extends 1 mile southeasterly from Lynn Point.

Greene Island Harbor is an excellent harbor, where protection from all winds and good anchorage will be found in 24 to 36 feet close to the northeasterly shore of **Greene Island.** Reefs extend from Greene Island to Manitoulin Island, the most prominent being **Mink Reef,** with 3 feet depth. A spit with depths under 18 feet extends ⅝ mile southeast from the easternmost point of Greene Island, narrowing the entrance to Greene Island Harbor. **Labrador Reef,** with 5 feet depth, extending southwesterly about ¾ mile from the point between Quarry and **Belanger Point,** and **Jones Shoal,** a detached reef with a least depth of 7 feet, 1¼ miles southwesterly from Belanger Point, are obstructions at the east side of the entrance to this harbor. **Ainslie Rock,** with 2 feet of water over it, is a detached rock ½ mile southerly from **Girouard Point,** with 13 feet of water ½ mile beyond in the same direction. Three-fourths of a mile west of Ainslie Rock there is an outlying spot with a depth of 18 feet.

Burnt Island Harbor affords fine anchorage behind the north side of **Burnt Island** in depths of 24 to 30 feet, with good holding ground and protection from all but westerly winds. **Stafford Rock,** with a depth of 5½ feet, and a 17-foot shoal ½ mile from it, lie southwesterly, 1 and 1½ miles, respectively, from the southwesterly point of Burnt Island.

Western Duck Island affords, in northerly gales, a good lee in depths of 30 to 40 feet, within ¼ to ½ mile offshore. Reefs with 8 feet depth are found 1 mile off the north side of the island. **Western Duck Reef,** with a least depth of 6 feet, lying 1½ miles northwest of Western Duck Island, extends 1 mile in an east and west direction.

Inner and Middle Duck Islands.—A long narrow reef, with depths of 4 to 14 feet, the shoalest part of which is called **Thibault Shoal,** extends from **Green Point** on Manitoulin Island to the north point of Inner Duck Island; two spits extend to the south and southeast from the island for ¾ mile; the easterly one, called **Macauley Spit,** has a depth of 8 feet. A spit with a depth of 5 feet extends ¾ mile north from Middle Duck Island. **Kipling Reef,** with a depth of less than 6 feet of water, is at the outer edge of a bank extending ¾ mile westerly from the southwest point of Middle Duck Island.

Outer Duck and Great Duck Islands afford, in the narrow channel between them, and opposite **Gravel Point,** good anchorage and protection from all winds. Great Duck Island Light, is on the southwest point of the island; an air fog diaphone 190 feet southeast of the light and a radiobeacon are also operated. **Mary Shoal** with 7 feet, **Larry Rock** with 11 feet, and **Kitty Shoal** with 8 feet, least depths, lie from ½ to 1½ miles off the southerly end of Great Duck Island. **Jennie Graham Shoal,** with least depth of 6 feet, lies nearly 2 miles off the south point of Great Duck Island, and in line with Mary Shoal and the easterly extremities of Great Duck Island. Shoal water extends from the southeasterly shore of Great Duck Island in a southeast direction to the middle of the west shore of Outer Duck Island, with a depth of 14 feet or less. A rocky split extending 1¼ miles south from the southern point of Outer Duck Island has a depth of only 11 feet at the outer extremity. **Manitoba Reef,** out of water, lies ⅝ mile off the northerly point of Great Duck Island.

Carroll Wood Bay, between **Walkhouse** and **Goose Points,** is generally shallow, and its deep water is spoiled by three banks as follows: **Gaspesia Shoal,** with 14 feet least depth, lies ½ mile southeasterly of Walkhouse Point, with a 30-foot channel between it and the point. **Seaman Reef,** with a least depth of 8 feet, is 1¼ miles northeasterly from Walkhouse Point and ½ mile offshore. **Morrell Reef** is a detached narrow shoal ¾ mile in length north and south, with a least depth of 4 feet; its northern extremity lies ⅝ mile southeasterly of the westerly point of the east shore of Carroll Wood Bay, and its southern extremity, with a least depth of 10 feet, lies ½ mile southwest of Goose Point. Shoal water, with rock bottom and boulders, extends ¾ mile in a southeasterly direction from Goose Point.

The following bays on the south shore of Manitoulin Island form harbors of refuge in heavy north, northwest, and northeast gales, but strangers should be very cautious about entering on account of the many outlying dangers.

Hensley Bay affords anchorage in 24 feet, sandy and stony. **Buller Reef,** a small cluster of dry stones, lies at the westerly entrance to this bay, with a narrow spit extending due south for 1½ miles from shore, having depths of 13 to 16 feet. On the east, reefs with scattered boulders run in a southwesterly direction ¾ mile from **Misery Point,** including **Methuen Reef,** with 4 feet depth, at the outer end.

Misery Bay has anchorage for small craft in 12 feet over sand and mud. A series of detached reefs, embracing **Taylor Reef,** with a least depth of 12 feet, and other 13- and 14-foot spots, extend south for 1¾ miles from the middle of Misery Bay; a 14-foot spot at the extreme southern end lies 1⅝ miles southeasterly from Misery Point. **Saunders Reef,** with 4 feet depth, is ½ mile to the northeast of Taylor Reef and ½ mile offshore. Frechette Bank, with a depth of 4 feet, lies 1 mile south of **Frechette Point,** and detached spots with 13 to 17 feet depths lie ½ mile southwest and southeasterly of Frechette Bank and 1⅝ miles from Frechette Point.

Murphy Harbor affords anchorage for small boats only, in depths of 10 feet, sheltered by a small islet in the middle of the mouth of the harbor. The deepest water in the entrance is 6 feet, about midway between the islet and the southeast entrance point. The coast from Frechette Point to **Gatacre Point** should not be approached within ¾ mile. **Shamrock Bank** with a depth of 4 feet extends from shore 1¼ miles in a southwesterly direction; its outer edge is 1½ miles southeast of Gatacre Point.

Portage Bay, east of **Portage Point,** affords neither shelter nor holding ground, and its shores are very foul. **Thistle Reef,** a long and narrow spit with a depth of 4 feet at its north end and 8 feet near its outer extremity, extends 1½ miles in a southerly direction, beginning 1⅛ miles southeast of Portage Point. The west edge of this

reef, with depth of 13 feet, is 1½ miles southeasterly of Portage Point, and an 8-foot spot on the east side of the reef lies 1⅝ miles southeast of Portage Point.

Srigley Bay has excellent anchorage in 27 feet, sand bottom.

Dominion Bay affords good anchorage off **Dominion Point**, in 5 fathoms, sand bottom. Shoal water extends ½ mile offshore from **Melville Point** to Dominion Point, with two outlying 13- and 16-foot spots, 1⅛ miles southwesterly and ¾ mile southwest, respectively, from Dominion Point.

Square Bay, Lougheed Bay, Lonely Bay, and Dean Bay are good small-boat harbors in heavy northerly winds, with depths of 12 to 18 feet. **Lougheed Reef**, with depth of 10 feet, extends ¾ mile southwest from **Lougheed Point**, and **Milton Reef**, with a least depth of 4 feet, extends ⅞ mile southwesterly from **Milton Point**. **Dean Spit**, with a depth of 10 feet, extends over ½ mile in a southwesterly direction from the point between Lonely and Dean Bays. Shoal water in Dean Bay extends ⅞ mile from shore, with very shoal spots of 4, 7, and 11½ feet depths running in a southwesterly direction along the middle of the bay.

Providence Bay is the first indentation of any importance east of the Duck Islands, 31 miles distant. A small settlement exists here, the local industries being agriculture and fishing. There is a Government landing wharf 496 feet long, with a warehouse thereon and a light on the outer end. A turning basin behind the wharf 285 feet long by 192 feet wide and an approach channel 540 feet long by 150 feet wide have a depth of 16 feet. The southwesterly side of the approach bears northwesterly from the northeast corner of the wharf.

Excellent anchorage is to be had in 18 to 24 feet off **Simcoe Point** and near the wharf. **Simcoe Bank**, with a depth of 10 feet, lies at the entrance to Providence Bay and runs ⅞ mile from Simcoe Point in a southwesterly direction; it is not marked. Providence Bay Light is on the extremity of **Providence Point**, the headland on the east side of the mouth of the bay, ½ mile southwesterly from the wharf.

Between Providence Point and Timber Bay, shoal water extends ¾ mile offshore with reefs and rocks awash, the **Everett Reefs** being the most dangerous, with 9 feet ½ mile from shore. Timber Bay Shoal is a detached reef with a boulder out of water, 1¾ miles northwesterly of Jenkins Point. A detached 7-foot spot ⅝ mile off the shore lies 1 mile northwesterly from the same point and at the northerly entrance of Hughson Bay.

From Jenkins Point to Rathbun Point the coast should not be approached within 1 mile, as it abounds in reefs and rocky ledges. **Buckeye Shoal**, a detached reef with a depth of less than 6 feet, lies 1 mile south of Jenkins Point. A shoal with a least depth of 11½ feet lies ⅞ mile southwesterly from the same point and ⅔ mile westerly from Buckeye Shoal. From Rathbun Point, a spit with 10 feet extends ½ mile from shore.

Michael Bay, formed by **Hammond** and **Michael Points**, is landlocked on three sides and open to the westward. It is an excellent harbor, affording anchorage in 18 to 30 feet, clay bottom. A small wharf at which there is 6 feet of water is situated on the north shore. When entering pass to the west and north of **Advance Reef**, a detached narrow, rocky shoal ¾ mile in length from southwest to northeast, with a depth of less than 6 feet, lying with its westerly end 2⅛ miles westward of Michael Point. **Chisholm Shoal** in Michael Bay, with 4 feet of water over it, lies ¾ mile southwest from the wharf. From Michael Point a narrow spit with depths under 10 feet extends 1⅛ miles in a westerly direction, nearly to Advance Reef, above described.

Michael Point to South Bay.—The bight between Michael and **Walker Points** is blocked by reefs extending 1⅛ miles from shore. **Genesta Reef**, with a depth of less than 6 feet, is a detached shoal lying 1½ miles southeast of Michael Point.

Between Walker Point and the South **Baymouth Range** Lights and ¾ mile southeasterly from **Walker Point**, lies **Volunteer Spit**, with a depth of 10 feet. **Red Dan Reef**, nearly awash, lies ⅜ mile southeasterly from **Birch Point**, and **Scotchie Reef**, with **Inkster Rock** nearly awash, lies 2,400 feet southwesterly from South Baymouth Front Range Light and 500 feet west of the line of range. Marked by a buoy on the west side, Wallace Rock, another detached shoal, with a least depth of 13 feet, lies 900 feet east of the range line and 1⅛ miles southwesterly from the front light. A buoy is moored near the range line about 2,000 feet southwest of the latter shoal.

Research Towers.—In 1963, two observation towers were established in the lake for the purpose of research. One tower is at 45°33′26″ N., 82°00′40″ W., and the other tower is at 45°40′11″ N., 81°49′34″ W. The towers are painted black and white. To prevent ice damage through the winter season, the superstructures will be removed and the positions marked by winter spars.

South Bay affords protection in all winds and extends 14 miles in a northeasterly direction, inclosed on the eastern side by the peninsula which terminates at its southern and southwestern extremities in **Hungerford Point** and **McGaw Point**. The greatest depth in the bay is 190 feet; the least depth generally at 800 feet from the shore is about 24 feet. Fine anchorage in from 24 to 40 feet, mud bottom, is found in the bay. The South Baymouth range indicates the channel, in which the least depth is 16 feet about 1,100 feet from the front light, leading into this fine harbor, which is free from dangers, except **Glycerine Rock**, with only 2 feet depth and deep water surrounding it, lying about 3,600 feet off the easterly shore of the bay abreast of Indian Village. A fog horn at the front light sounds during restricted visibility. In entering, keep on the range, 024°, until within 600 feet of the front light, then haul to 073°. In 1948, a mooring basin 260 feet long with an average width of 100 feet, connected to Huron by an entrance channel 40 feet wide, ¼ mile southwest of the Government wharf, was dredged to a depth of 5½ feet. It is a safe anchorage in all weather, and contains four timber crib block and span type wharves, two of which are 54 feet long, and two are 40 feet long. About 400 feet inside the mouth, the basin is crossed by an overhead cable with a clearance of 25 feet.

Thomas Bay affords protection from all winds and good

anchorage in depths of 18 to 40 feet, mud bottom. A spit with a depth of less than 6 feet extends ⅖ mile southerly from **Thomas Point**, west side of the entrance. **Todman Reef**, with a least depth of 5 feet, lies in the middle of the entrance to Thomas Bay, 1 mile easterly from Thomas Point. A depth of 36 feet is available through the westerly channel leading into the bay. **The Grantham Shoals**, with a least depth of 6 feet, and **Vigilant Rock**, with 10 feet, are detached rocky reefs 1 mile offshore and near the easterly entrance of Thomas Bay.

From the east entrance point of Thomas Bay to Hungerford Point the shore should not be approached nearer than 1¼ miles.

The North Coast of Manitoulin Island, on **North Channel**, is indented by large and deep bays, all affording good anchorage and protection, but most of them exposed to northerly winds. The largest bays are Smith Bay, Manitowaning Bay, Sheguiandah Bay, West Bay, Mudge Bay, Gore Bay or Janet Cove, Julia Bay, Bayfield Sound, Vidal Bay, and Meldrum Bay. A detailed description of the north coast is given in Volume II, Great Lakes Sailing Directions, published by the Canadian Hydrographic Service, Department of the Environment, Ottawa, Canada.

Smith Bay, the most easterly, is obstructed by dangerous reefs, including **Goldhunter Rock** with 2 feet of water, **Pelkie Rock** with 4 feet, and **Doyle Rock** with 19 feet. **Frank Ledge**, with 2 feet of water on it, is also a dangerous spot at the north entrance. **Wekwemikong**, an Indian village, is at the northwesterly head of the bay, and has a wharf and cribwork under water. Two red spars mark obstruction at outer end. Cape Smith, on which there is a light, is the northeast point of Manitoulin Island at east side of the entrance to Smith Bay.

Manitowaning Bay, westward of Smith Bay, is a fine sheet of water 11 miles in length, clear of outlying dangers. The town of **Manitowaning** is situated at the head of the bay. The public wharf, situated in the bay below the lighthouse, consists of 180 feet of floats secured in a line from shore to an anchor crib with finger floats each side of the line for small craft use. Depths of 16 feet on each side remain from the slips of the commercial wharf which previously occupied this location. An L-shaped pile trestle government wharf 140 feet long by 6 feet wide, with depths varying from 4 to 10 feet at the wharf face, has been constructed immediately south of the public commercial wharf also to accommodate small craft. The southern portion of the bight formed between **Narrow Point** and the town wharves is shallow, but as the wharves are approached the water deepens and good anchorage in from 18 to 30 feet, with mud bottom, is found between the wharves and Fanny Island. Manitowaning Light is 750 feet northerly of the Government wharf.

Sheguiandah Bay is a large indentation between Manitowaning Bay and Little Current. In entering this bay, **Loon Island Reef** with 2 feet, **McGregor Bank** with 5 feet, and **Boulton Reef** (north extent marked by a buoy) with 5 feet, least depths, on the southerly side of the approach, should be carefully avoided.

Sheguiandah Village, on the northerly shore of the bay, has a post office and a public wharf of close pile wall construction, 103 feet long and 44 feet wide with 8 feet of water along side. The public wharf at this location is in disrepair and serves only as a breakwater. A small boat landing 90 feet long with 4 feet of water at the face has been constructed in the lee of the breakwater. A range of lights leads into the bay clear of Boulton Reef, **Leech Island Reef** (northwest tip marked by a buoy), and the reef off the south point of Strawberry Island (south extent marked by a buoy). The front range light is shone from a mast near the southeast corner of the Government wharf, and the back mast is on the hillside, 900 feet 261½° from the front post.

Immediately north of the Canadian Silicate Co.'s quarry 1½ miles northeast of Sheguiandah Village and north of Frost Point is a former wharf comprised of three floating platforms which were not in position in 1964. The center one was moored at the end of a stone-filled approach and the other two moored to pile clusters at either end of the center one, providing a berth of 400 feet which was dredged to a depth of 19½ feet in 1948. A turning basin in front of this former structure, with a radius of 450 feet and an entrance channel with a width of 150 feet to connect the turning basin with the main channel, have been dredged to depths of 19½ feet. Unlighted ranges have been established on the centerline of the entrance channel, and the basin is outlined with wooden markers.

Strawberry Island Channel (leading north from Sheguiandah Bay toward Little Current) is a passage between **Strawberry Island** and the neighboring shore of Manitoulin Island. If properly buoyed, 22 feet might be carried through; at present, with four ranges, 18 feet will be found. The channel, however, in its present unbuoyed state is not recommended. Strawberry Island Light is on the northernmost extremity of the island (this point being bold-to).

Little Current occupies an important position, being situated on the south side of the narrow channel through which all vessels must pass in navigating between Georgian Bay and North Channel. The town of Little Current has good stores and hotels, telegraph and telephone lines, wharves with ample water alongside.

The eastern channel, between Manitoulin and Goat Islands, has ample depth and width, and is entered through a dredged cut 400 feet wide and 22 feet deep, passing close off **Gibbons Point**. There is a rock shoal with least depth of 11 feet, lying about 500 feet east of Gibbons Point. The dredged cut is to westward of this shoal and is marked by buoys and a boat-type buoy at the northwest end of the cut. A range of lights about ½ mile south of Gibbons Point, with bearing of 259° marks the approach from eastward, and a buoy indicates the turn at the southeasterly end. After rounding the latter buoy, the line of approach to and through the cut is marked by a range of lights; the front light is on the south side of Goat Island east of Mallard Cove, and from it the rear light bears 831 feet 319°.

In front of the town and extending westerly and northerly to opposite Spider Island Lighthouse, there is a curved dredged channel marked by several pairs of buoys,

which is about 400 feet wide at its easterly end and 300 feet wide at the northerly end, widening out in the intermediate curving section, and having a depth of 20 feet. Vessels should beware of the variable current here, as it changes frequently both in direction and velocity, due to atmospheric conditions, and sometimes runs as much as 4 miles per hour. The south side of the channel in front of the town over a length of 1,800 feet, is faced with public wharfage of timber construction. Water depths vary from 15 to 20 feet in front of the easterly portion. Westerly from the Post Office, depths decrease gradually to about 5 feet at the western end. A light, shown from the northeast corner of the post office roof, is visible down the channel and can be used as a general guide when approaching the wharves from the eastward. Spider Island Light is on the east point of Spider Island.

North of Spider Island Light the course turns into the western approach. Here a cut 20½ feet deep and 300 feet wide has been dredged westerly to a point northwest of Picnic Island, its south edge passing 50 feet north of the north tangents of Low Island and Picnic Island. To the westward of this cut the channel is 300 feet wide. Suitable buoys mark the edges of the available channel. Picnic Island Light is located on the northwest point of the island. Narrow Island Light, on the west extremity of Narrow Island, marks the south entrance point of the western approach and may be approached to within 500 feet. A buoy marks the extremity of the shoal 600 feet north of Narrow Island Light, there are two rocks with 4 feet depth, 1,200 feet west of the light, and there is a rock shoal with 14 feet of water over it located 3,700 feet east of the light.

Goat Island—Bridge.—Goat Island, opposite the town of Little Current, is the terminal port of the Canadian Pacific Rail (Little Current Branch), which extends about 40 miles inland to the Soo branch of the Canadian Pacific Rail at Espanola. The terminal wharf is 1,480 feet long, constructed along the shore parallel to the channel, and the water approaching from the east and along the wharf front has been dredged to 20 feet. The wharf is equipped with a large coal bridge and the storage capacity is about 500,000 tons.

The railway swing bridge crosses the eastern channel immediately east of Little Current. Vessels are required always to use the starboard opening, and must not pass through the bridge until the swing span is fully open and resting on the protection pier. The channel openings are marked by a light on each side, so arranged that only two lights are visible in the direction of an approaching vessel and mark the starboard channel to be used. The swing span is surmounted by a light showing red up and down the channel when the bridge is closed and green when open. Vessels will sound three long blasts of the whistle as a signal for opening. The bridge operator will reply with one long and one short blast of the horn if the bridge is to be immediately opened; but if the bridge cannot be opened, five short blasts of the horn will be given. No vessel shall attempt passage through the bridge until the operator gives the above signal that the bridge is to be opened. Mariners are warned that narrow channels and erratic currents demand great caution in approaching this bridge.

The Canadian Pacific Rail crosses from Goat Island to the north shore over a fill and a bridge which provides headroom of not more than 6 feet for access by vessels from the east to waters north of the island.

West Bay is about 8 miles long, and its width between Wabos Island and Francis Point is 6 miles. In the northerly approach to the bay, a flashing red float light marks the southern edge of **James Foote Patch.** A depth of 180 feet will be found in the middle of the bay and 120 feet within 300 feet of the east shore of the southern part. There is anchorage at the head of the bay in from 30 to 50 feet, mud bottom. At the head of the bay is an Indian Village. There is a public wharf of cribwork construction 48 feet long and 20 feet wide with 5 feet of water along all faces. Sounding Cove, in the east shore, affords good shelter from northerly gales, with 24 to 40 feet over mud bottom to within 900 feet from the north shore of the cove.

In the vicinity of Francis Point, between West Bay and Mudge Bay, the following obstructions are found: **McRae Patch,** with a least depth of 16 feet over rock, 1 mile northeast of Francis Point; **Tache Island Reef,** a patch of exposed and sunken rocks in the shoal water extending ⅓ mile northerly from Francis Point; and **Martin Reef,** an exposed reef, about ¾ mile northwesterly from Francis Point.

Honora is a small village on Honora Bay, off West Bay. It is connected by highway to outside points and has telephone and telegraph connections, and a hotel. A wharf 146 feet long and 16 feet wide, constructed in 1949, provides 6 feet of water at the outer end. It is well protected by a breakwater and should give safe anchorage in all weathers. The distance between the breakwater and wharf at the entrance is 60 feet.

Mudge Bay is 3½ miles wide between **Trudeau** (formerly **Gooseberry**) **Island** and **Maple Point,** and 3½ miles long. A light on the northeast point of Trudeau Island marks the east side of the entrance. The bay has depths of 36 to 48 feet, with mud bottom, making it a fine anchorage. The only danger is **McInnes Bank,** 600 feet in diameter and with 8 feet of water, lying in the middle of the bay, 1 mile northwesterly of Trudeau Island. The south end of this bank is marked by a buoy in 21 feet of water. **Sutherland Shoal,** with a depth of 11 feet, situated about ⅔ mile from the shore line extending south from Maple Point, lies about 1⅜ miles northwest of McInnes Bank, about ⅞ mile northeasterly from the extremity of Sextant Point, and southerly nearly ½ mile from Little Island. **Kagawong,** at the south end of the bay, has a Government wharf, L-shaped, measuring 166 feet along the stem and 105 feet along the toe with 17 feet of water along both faces. A freight shed 24 feet by 60 feet is located on the wharf. There are a post office and telephone and telegraph connection with Little Current and the Canadian Pacific Rail. Kagawong Light is 200 feet west of the west wharf.

Clapperton Channel separates Manitoulin Island from **Clapperton Island,** and extends from the south point of

Clapperton Island and Francis Point on the east to Courtney Island and Maple Point on the west. This channel may be navigated in daylight and clear weather by vessels of 5 feet draft, and is marked by buoys through the channel. Buoys at the westerly end of the channel are 1,500 feet southwest of Middle Bank and on the north side of South Spit.

Gore Bay is 1½ miles wide at the entrance and 2¼ miles long, gradually narrowing toward the head, at which is located the town of Gore Bay. It affords good anchorage in from 24 to 60 feet, mud bottom. The town of Gore Bay is the county seat of Manitoulin Island. The Government wharf is constructed of steel-sheet piling, backfilled and has a concrete deck 538 feet long with widths of 10 feet and 16 feet. Two freight sheds 37 feet by 26 feet and 40 feet by 60 feet are located on the wharf. A steel sheet pile extension 265 feet long is located at the north end and at right angles to the main wharf. There is 16 feet of water along the southerly and easterly faces of the main wharf. Additional wharfage was constructed in 1969 for small craft, south of the main wharf and consists of floating units attached to a crib and span wharf. The water depth varies between 5 and 10 feet. A telephone line connects with other villages of the island and with the Canadian Pacific Railway telegraph system. A light is shown from a mast on Town Point on the west side of the bay. Gore Bay range of lights, located at the foot of the bay, carries vessels safely past the shoal at Town Point. Gore Bay Light is on **Janet Head** between Gore and Julia Bays.

Radio Facility.—A marine radio station at Gore Bay (call sign VFG2) is operated continuously from May 1 to September 30. This station provides a marine telephone service only.

Julia Bay is a deep, square indentation west of Gore Bay, between Janet Head and **Blackstock Point**, 3¾ miles broad and 3 miles long, with a depth of 120 feet ¼ mile from the head; it is unsuitable for anchorage in northerly gales.

Bayfield Sound (Cooks Bay) is a large inlet sheltered from the northward by **Barrie Island**, which is joined to the mainland by a causeway, and the small islands west of the latter. It forms a large harbor about 10 miles long and 4½ miles wide at the widest part. **Heron Patch** and **Jubilee Shoal** lie northwest of Barrie Island and at the east side of the entrance to the sound. The former has 13 feet depth; the latter has boulders awash, and bears from Cape Robert Light 4¼ miles southeasterly. **Cape Robert** Light stands 150 feet inside the low north extremity of the west entrance point. To enter the sound, steer midway between Fanny Island and the west extremity of Barrie Island, thence southward and anchor either ¼ mile due west of **Charlie Island** in 18 to 24 feet, sand or clay bottom, or ½ mile east of the southeast extremity of **Henry Island** in 36 feet, mud bottom. A buoy marks the eastern extremity of the shoal water off Fanny Island.

Cook Bay, entered between Gauthier Point and Battery Bluff, has a government wharf 200 feet long with a depth of 8 feet at the outer end situated on its southeastern side providing an excellent refuge for small craft up to 6-foot draft.

Vidal Bay is a long and broad indentation affording excellent anchorage and shelter in 30 to 36 feet. **Vidal Island**, 2 miles long and 1 mile wide, lies across the mouth of the bay; eastward of the island there is a passage leading into the bay through which 18 feet might be carried if properly buoyed; 16 feet can be carried in by taking great care to avoid banks extending about ¾ mile off the southeast side of Vidal Island, marked by a red spar buoy, and about ½ mile off the main shore opposite, marked by a buoy, and a 10-foot bank, 1,400 feet long north and south, situated nearly in the middle of the channel and with its north end about southwesterly ⅞ mile from the north side of **Masson Island**. There is good anchorage in 18 to 24 feet, with sand and clay botton, ½ mile off the middle of the south shore of Vidal Island. There is foul ground at the west point if Vidal Island which is joined to **Batture Island** (distant 2¼ miles westerly) by a barrier reef over which there is no passage for a vessel. Batture Island, 8 feet high and wooded, 1,200 feet long east and west and 200 feet broad, marks the western termination of the barrier reef. On the north side of Batture Island, on which there is a light, the water is good and it may be approached to within 600 feet, but from the western end a reef marked by a buoy extends in a southwesterly direction for 2,600 feet, at which distance there is a depth of 9 feet; at ¼ mile from the island there is less than 6 feet depth, and care must therefore be taken to avoid this reef in entering Meldrum Bay from the eastward.

Meldrum Bay, the westernmost indentation on the north shore of Manitoulin Island, is 4 miles wide between **Chamberlain** and **Brittomart Points**, and 3 miles long from the line of these points, with a breadth of 1¾ miles at the head. A light is shown on the northwest point of Batture Island, at the eastern side of the entrance to the bay. In entering the bay from the eastward care must be taken to avoid the shoal off Batture Island, above described. In westerly gales the bay affords shelter in depths of 30 to 60 feet. On the west shore ¾ mile from the head of the bay there is a sawmill and wharf, with 20 feet depth. A Government wharf with landing face 88 feet long and depth of 14 feet, and a freight shed thereon, were built in 1935 just south of the old sawmill. A light is shown from a mast on the northeast corner of the warehouse on the Government wharf.

Meldrum Bay is a Canadian Customs port of entry and is used by almost all American yachts intending to cruise the waters of the North Channel. Three small boat landings, each 88 feet long and 10 feet wide with 8 feet least depth alongside, have been constructed in the lee of the main wharf to accommodate this traffic.

Meldrum Point is the northwest extremity of Manitoulin Island, and is at the east entrance from North Channel to Mississagi Strait. Mississagi Light is 6 miles distant.

Georgian Bay Entrances Between Manitoulin Island and Cape Hurd, Ontario.—Owen Channel, 1½ miles wide,

separates the southeast end of Manitoulin Island from the opposite northwest shore of Fitzwilliam Island. **Ship Bank** with a depth of 6 feet, and **Stewart Rock** with a least depth of 1 foot, lie at the entrance to Owen Channel and are separated from each other by a narrow channel 20 feet deep. **Beach Point Flat** is an extensive rock bank with depths of 9 to 11 feet, fronting the beach on **Fitzwilliam Island** southwest of Beech Point; its northerly edge runs ½ mile westerly from **Beech Point**. Thence, under the name of **The Ridge**, with 6 feet best water, it joins Owen Island bank, opposite; the latter, with depths of 9 feet, extends on all sides from **Owen Island** and to **Hungerford Point** on the west; the depth of 9 feet extends to a point ½ mile east of the south extremity of Owen Island, on The Ridge.

Little Rock, with a least depth of 10 feet, lies 1½ miles northeasterly from the westerly end of Perseverance Island. A rock with a depth of 13 feet lies ⅜ mile northwest of Little Rock. There is shoal water along the entire western coast of **Fitzwilliam Island**; at **Phoebe Point** it extends ⅜ mile southwest, covering **Wild Bight** and gradually deepening toward **Perseverance Island**, and thence shoaling again to the south and southeast to within ¼ mile from the shore of Fitzwilliam Island.

Rattlesnake Harbor.—The north entrance point of this excellent harbor is situated 1 mile southwestward from Northeast Point, Fitzwilliam Island. It contains shelter from all winds in from 12 to 21 feet over mud. Little Island is a good mark in approaching the harbor. A narrow ridge of dry stones extends from this island 600 feet northeasterly, and from the end of these stones shoal water continues in a northeasterly direction 600 feet farther. The dry stones at the southwest extremity of Little Island are separated from those off the shore of Fitzwilliam Island by a narrow boat channel having less than 6 feet depth. From **Rattlesnake Point** a spit extends in a westerly direction 600 feet, leaving a passage between it and the shoal water from Little Island, above alluded to, 1,200 feet in width, through the middle of which about 14 feet can be carried into the harbor. Little Island and the shore of Fitzwilliam Island for a half mile westward of it should not be approached nearer than 900 feet; thence to Beech Point the shore is steep-to.

Club Harbor is on the east side of **Club Island**, in Georgian Bay off the southeast end of Manitoulin Island and 7 miles northeast from the north end of Fitzwilliam Island. The harbor contains excellent though limited anchorage in 18 feet. The entrance is obstructed by two rocky ledges known as **North Reef** and **South Spit**, between which about 12 feet may be carried. The anchorage under **Fishery Point** is confined to a space of about 6 acres.

Fitzwilliam Channel passes between Fitzwilliam and Yeo Islands. **Emily Maxwell Reef** is an extensive rock shoal with a least depth of 2 feet, extending 1¼ miles in a southwest direction from a point 1 mile northwest of the extreme end of **Indian Harbor Point**, the most southerly projection of Fitzwilliam Island. **Indian Harbor Reef** is a rocky ledge with depths varying from 2 to 18 feet and extending ¾ mile in a southwesterly direction from Indian Harbor Point. **McLelan Rock**, with a least depth of 8 feet, is a bad obstruction at the entrance of **Fitzwilliam** Channel; it is small, and its center lies 1¼ miles southwesterly from Indian Harbor Point. **Smith Rock** is a small rocky patch with a least depth of 14 feet, lying 1½ miles south of Indian Harbor Point, and is another bad obstruction at the entrance of Fitzwilliam Channel.

Manitoba Ledge, a dangerous reef at the southern edge of Fitzwilliam Channel, lies to the westward of Yeo Island. This ledge extends 1 mile northeast and southwest and is 2,100 feet in width; at its northeast end there are rocks awash; near the southwest extremity, which lies ¾ mile southwesterly from the southwest point of Yeo Island, a least depth of 2 feet is found. A channel with 36 feet separates this ledge from Yeo Island; but its passage should not be attempted without local knowledge.

James Island, in the easterly part of Fitzwilliam Channel, is 2¼ miles northeast of Yeo Island, and a shoal bank extends southwest from it 1⅛ miles, narrowing the passage between the two islands. From **McCarthy Point** of Fitzwilliam Island, a ledge extends 2¼ miles southerly with 8 feet at the outer end, and approaches to within ½ mile of James Island Reef, above mentioned.

On the southeast side of Yeo Island, there is a deep channel ¾ mile wide passing between that island and **Lucas Island**. A buoy is located in 27 feet of water and marks the limit of the shoal water southeast of Yeo Island. A buoy is located ½ mile 260° from Lucas Island light to mark the northerly edge of shoal awash in Yeo Channel. A buoy marks the northerly extent of West Sister Patch, described below, on the south side of this channel at the westerly end, and Lucas Island Light marking the northerly side of Lucas Island.

Main Channel.—Cove Island Light is situated on Gig Point on the north end of **Cove Island**, south of the Main Channel entrance into Georgian Bay; a fog signal and radiobeacon are at the light. A lighted buoy about 5½ miles west of Cove Island Light marks the western approach to Main Channel.

Two rocky patches called **East Sister** and **West Sister**, with least depths of 17 feet, bear northwest 3⅜ and 3¾ miles, respectively, from Cove Island Light. **Bad Neighbor Rock**, just above water, is the most dangerous reef in Main Channel, and lies 2¾ miles northwesterly from Cove Island Light; from it shoal water with a depth of 7 feet extends 1,200 feet southerly, where it is marked by a buoy. In approaching this rock from the eastward or southward in thick weather or at night great caution must be exercised, as the reef rises abruptly from 240 feet within 1,200 feet and from 180 feet within 500 feet; **O'Brien Patch**, with least depth of 19½ feet, southerly of Bad Neighbor Rock is marked by a buoy. **Gat Point Reef**, with depths of 1 to 14 feet, extends southerly ½ mile from **Gat Point**, at the northwest extremity of Cove Island. **Gat Point Rock**, a detached rock with a depth of 11 feet, lies ⅝ mile southerly from the same point.

To the eastward of Bad Neighbor Rock, a line of reefs, separated from each other by deep water and called the

Great Barrier, extends from a point 1½ miles east of Lucas Island southeasterly for about 7 miles, Snake Island being near the southeasterly end. The passage between the Snake Island shoal and Flowerpot Island is 1¾ miles wide. Flowerpot Island Light is on the northeast point of the island; an air fog horn sounds as required.

MacGregor Channel.—The passage between Cove Island and Cape Hurd is nearly closed by outlying reefs, as noted below. **Northwest Bank,** a rocky patch with depths of 4 to 14 feet, lies 2 miles in a southwest direction from Channel Point, on the southwest coast of Cove Island. Detached rocky spots running in a southwesterly direction from Cove Island and Turning Island obstruct the passage between them and Northwest Bank. **White Rock** is about ½ mile southwesterly of Turning Island, with **Greenfield Rock** about ¼ mile east of it and ⅜ mile southerly from Turning Island. Middle Bank, lying close southeasterly of Northwest Bank and nearly 3 miles northwesterly from Cape Hurd, is a rocky ledge 1 mile long east and west and the same distance northwest and southeast, with rocks nearly awash on its eastern side and 11 feet at its westerly edge. **Southwest Bank,** with a least depth of 5 feet, ¾ mile in length north and south and ½ mile wide, with other detached 14-foot spots ⅛ mile to the southwest, lies with its northern extremity 2¼ miles northwesterly from Cape Hurd. **Southeast Bank** extends northward 1.6 miles from Cape Hurd to within ½ mile south of Devil Island, with a number of rocky ledges having a least depth of 1 foot, the outer ledge running 0.8 mile in an east and west direction, its western extremity lying 1¾ miles north of Cape Hurd. A ledge extends to the south and east of Devil Island ½ mile, with a depth of 5 feet. A light located on Cape Hurd is visible from 357° through 222°.

Entrance through Devil Island Channel is made on a northeast course passing to southeastward of Southwest Bank and Middle Bank and to the northwestward of the reefs extending from Devil and Russel Islands. The passage is indicated by a buoy in 30 feet of water at the south extremity of Southwest Bank, and by buoys west of the extremities of the reefs extending westward from Devil Island and Russel Island, respectively. This course then follows on the Otter Islands Range Lights with the front light shown 35 feet above the water from a steel pipe mast on the south side of S. Otter Island and the rear light shown 65 feet above the water from a tapered steel pipe tower, 3,000 feet 040°25′ from the front light and located on the east side of N. Otter Island.

Earl Patches is a detached rocky shoal extending ¾ mile from northeast to southwest and ¼ mile in width, with rocks on the north end and the west side and a depth of less than 6 feet; the south end is ¾ mile westerly from Wreck Point. **China Reef,** with rocks and a depth of 8 feet at the extreme end, extends ¾ mile southwesterly from Wreck Point. A depth of 36 feet can be found through a tortuous channel south of Devil Island Shoal and between Earl Patches and China Reef into Georgian Bay, marked by buoys.

Section VII.—Localities in Georgian Bay and North Channel Area, Ontario

Charts of Canadian waters are prepared by the Canadian Hydrographic Service, Department of the Environment, Ottawa, Canada

Georgian Bay and North Channel are fully described in Volume II, Great Lakes Sailing Directions, which may be obtained from the Canadian Hydrographic Service, Department of the Environment, Ottawa, Canada.

Aside from the descriptions pertaining to the north shores of Drummond Island, Mich., and Cockburn and Manitoulin Islands, Ont., given in sections V and VI preceding, no detailed treatment of these waters is here attempted. The following are descriptions of some of the localties in the St. Joseph Channel, in the North Channel and in Georgian Bay, in geographical sequence from west to east.

Richards Landing, Ontario.—A small village, with a Government wharf and warehouse, on St. Joseph Island, situated in the southern part of the portion of St. Joseph Channel, called Bear Lake. The Government wharf is rectangular in shape measuring 180 feet at the outside face and 90 feet wide with one freight shed located on the structure. Berthing is only recommended at the front, west face and 75 feet on the back face at the west end of the wharf. A breakwater wharf 150 feet by 16 feet has been extended easterly from the eastern end of the Government wharf. It provides sheltered berthing for small craft with least depth of 8 feet at both front and rear faces. There is a depth of 14 feet at the front face which shallows to 5 feet at the back face, and the immediate approach is free from danger. Richards Landing Light is shown from the roof of the wharf warehouse and having a height of 16 feet above the wharf. A shoal with least depth of 10.5 feet is located on the north side of the vessel course in St. Joseph Channel, about 2,300 feet 018° from the wharf light.

The coast of St. Joseph Island from Richards Landing to Shoal Island takes the shape of a large bay, off the shore of which a flat under the depth of 18 feet extends an average distance of ¾ mile.

Chart 14883.—Wilson Channel, Ontario.—This passage is between Wilson Island and the steep mainland shore. A reef extends 300 feet westward from the northwest end of the island, and the greater portion was formerly covered by a crib, which is now a wreck from decay and fire. About 90 feet of the reef projects beyond the cribwork, being marked with a buoy nearby which is in 8 feet of water. A reef extends from the main shore at 900 feet west of the crib for a distance of 300 feet, the south end of which is marked by a buoy. A rock with depth of 16 feet over it is located northwesterly 240 feet from the end of the Wilson Island crib. A shoal with depth of 9 feet, marked by a buoy, lies about 1,500 feet eastward of the front range light and 125 feet offshore.

Lights.—Range lights on the main shore north of Wilson Island, and bearing 053°20′, lead from Richards Landing wharf to the turn in Wilson Channel, clear of Chicora Shoal and the 14-foot spot east of it, through the dredged

cut off **Bamford Island**, and clear of the shoals west of Wilson Channel.

The channel opposite Bamford Island was cleared in 1970 to a depth of 15 feet and full width of 150 feet, centered on the alignment of the range lights.

Bridge.—A highway bridge extending from Bamford Island to **Twyning Island** was completed in 1972. The buoyed Wilson Channel passing under this bridge has a width of 150 feet centered on the alignment of the range lights. The bridge structure has a vertical clearance of 38 feet and a horizontal clearance of 180 feet over the channel.

Desbarats, Ontario.—This village is on the **Desbarats (Walker) River** about 2 miles above the mouth, at the crossing of the Soo Line of the Canadian Pacific Railway. A pile trestle wharf 180 feet long, parallel to the shore, is located on the right bank of the river and adjacent to the main highway road immediately in front of the village. The turning basin in front of the wharf is 80 feet wide with depth of 6 feet.

The channel at the mouth of Walker River was dredged in 1927 to a depth of 6 feet and is marked by buoys. A line from the mouth of the river to Sister Rock Light coincides with the center line of the channel. In the river a channel not less than 35 feet wide with a depth of 6 feet was dredged in 1937 from the mouth to the wharf in front of the village. An overhead power cable with unknown clearance crosses the river about 0.5 mile above the mouth. No boat should proceed at a greater speed than 5 miles per hour in the river or approach thereto.

Gawas Bay, Ontario.—A narrow channel about 1 mile long, between **Campement d'Ours Island** and **St. Joseph Island**. A public wharf 64 feet long by 12 feet wide, with 6 feet of water at the other end, is located at the inner end of the bay in front of the V Line Road.

Chart 14860.—Hilton Beach, Ontario.—On the north shore of St. Joseph Island. There is an irregular shaped Government wharf with 550 feet of berthing space and 14 feet of water at the outside face. A light is shown from a lantern on the front of the freight shed on the outer end of the Government wharf. A buoy marks the point of a boulder shoal with about 12 feet depth, located 750 feet northwesterly from the north corner of the wharf.

For the protection of small tugs and motor boats, the Canadian Government in 1963 redredged a basin about 180 feet square to a depth of 9½ feet, or to the smooth limestone rock, in the dock between the Government wharf and the rock rubble breakwater immediately east of it. The best water will be found along the inside of the L of the Government wharf.

Fisher Shoal, with less than 6 feet of water over it, lies about 1,200 feet west of the north point of **Fisher Bay**, 0.8 mile bearing 093° from the outer end of Hilton Beach wharf.

Bruce Mines, Ontario.—On the north shore at the west end of North Channel, 45 miles southeast of Sault Ste. Marie. It is a port of entry. There is a post office, also a telegraph office at the Canadian Pacific Rail station, about 2 miles inland. The Government wharf here has been reconstructed in a U shape and now provides 400 lineal feet of small craft berthage in least depth of 8 feet. A navigation light is located on the outer end of the wharf. With a southeasterly gale, a little sea rolls in to the wharf, but good anchorage may be had under **McKay Island** in 18 feet, clay bottom.

A channel 150 feet wide and 15 feet deep was dredged in 1934, leading to the Government wharf. The axis of the channel bears 329° 32′ and is in prolongation of the middle line of the wharf; its southwest edge is marked by buoys. At the wharf a turning basin was dredged to the same depth for a width of 250 feet east and west and extending 50 feet north of the east and west corners of the pierhead.

Thessalon Point, on the North Channel of Lake Huron, is about 50 miles southeast of Sault Ste. Marie. The southerly tip of Thessalon Point is marked with a light shown from a mast.

Thessalon, Ontario.—The town of Thessalon is situated at the northerly or base end of Thessalon Point. The Thessalon River flows through the town and discharges on the east side of the peninsula. A depth of only 3 feet was available from the North Channel into Thessalon River through the sand bar at the mouth, in 1949. On the east side of the town is a commercial Government wharf. The wharf is protected by a breakwater having a light on the seaward end. The wharf extends easterly from the shore 342 feet and north in an L 101 feet. Floating units for small craft berthing are attached to the inside face of the wharf and are located about midway between the shore and the L. There is a frame freight shed located at the inner end of the wharf. A range of lights indicates the approach to the east wharf on alignment 022½°. On the west side of the peninsula, about 1¼ miles from the extremity of the point, is another Government wharf 325 feet long, extending to 17 feet depth, but having shallow water alongside at 150 feet in from the outer end. There are two small breakwater landing heads projecting at right angles to the north face of the wharf which provide shelter for small craft and local fishermen. The outer landing is 64 feet long by 16 feet wide and the inner one is 69 feet long by 12 feet wide. The outer structure has a wall built 4 feet above the deck for protection against the seas. This wharf is only occasionally used because of its exposed location and is currently in disrepair due to storm damage.

There is a good holding ground and shelter from westerly gales on the east side of Thessalon Point in 30 to 36 feet, about halfway between the point and the village, but with easterly gales considerable sea rolls in both at the anchorage and at the docks.

Blind River, Ontario.—A port on the north shore of North Channel about 30 miles east of Thessalon, and a station of the Canadian Pacific Rail, with stores, post office, and telegraph and telephone services.

Wharves.—At the mouth of Blind River on the west edge is a 300-foot marginal small craft Government wharf. Opposite this wharf and along the east edge of this White Pine Slip is a rock rubble breakwater. A depth of 6 feet was reported in 1965 in the channel into the Blind River.

Channels.—The approach channel to the dredged entrance channel to Blind River is marked by lights and buoys. The channel leads northward from **Belle Rock**, marked by a lighted buoy, about 1 mile southward of the river entrance, thence eastward of an unnamed island, marked by a light, just eastward of **Suzanne Island.** A light is shown at the entrance to the small craft wharf at the river mouth.

Serpent Harbor, Ontario.—An inlet on the north shore of North Channel just east of Algoma Mills, having ½ mile average width and running in an easterly direction nearly 3 miles to the mouth of **Serpent River.** There is a station of the Sault Ste. Marie branch of the Canadian Pacific Rail.

The entrance to the harbor lies between Meteor Rock and Narrow Point of Nobles Island, and is divided into two channels by Cross Island. The channel between Meteor Rock bank and Cross Island, which is the recommended and more direct passage, is 350 feet wide with 17 feet depth; the channel between Cross Island and Narrow Point is 300 feet wide with 20 feet depth, but has a sharp turn, making it awkward for a long vessel. The east and south sides of Cross Island are steep, while from the west extremity it is shoal for 50 feet, and on the north side shoal water extends 150 feet. Only 9 feet can be carried across the bank between Meteor Rock and Hospital Point on the main shore; this bank has but 1 foot depth at a point 1,000 feet NE. ¾ N. from Meteor Rock. Only 7 feet is available in the channel south of Nobles Island.

Inside the entrance there is a good channel with 13½ feet of water, north of **Nobles Island,** up to the ruins of the west wharf at the village of **Spragge;** ½ mile above the ruins of the former mill the depth of the harbor diminishes to 11 feet and less. There is anchorage in 11 feet over mud in the bight on the north side of Nobles Island, and in 16 feet over mud to the east of Nobles Island and between it and Smith Island.

Cutler, Ont.—A post office and station on the Sault Ste. Marie branch of the Canadian Pacific Rail, at the head of **Aird Bay** in the North Channel. There are four mooring buoys laid off the village for use by oil tankers discharging via pipeline.

Curran Rock, marked by a square, concrete beacon 9 feet high, is situated at the entrance to Aird Bay and northwesterly 1 mile from the south point of **Papineau Island. Casgrain Rock,** lies ⅞ mile farther up the bay, bearing southwesterly ⅗ mile from the north extremity of **Rykert Point.** The channel west of these rocks is perfectly safe; a straight course 221° 25′ from the ruins of Cutler wharf gives nowhere less than 24 feet. There are no wharves in Aird Bay off Cutler. The former wharves are in ruins and only the old piles remain visible. It is inadvisable to approach these ruins too closely.

Spanish, Ontario.—A village approximately 5¼ miles east of Cutler with post office and station and on Highway No. 17 and the Canadian Pacific Rail between Sudbury and Sault Ste. Marie. It is about 1 mile inland from the North Channel.

There is a Government wharf located on the North Channel which is 224 feet long by 12 feet wide. There is 224 feet of berthing space on the outside face and 140 feet on the back face. The depth of five feet on the front face makes this wharf only suitable for small boats. The approach channel from the North Channel into the Spanish River was dredged in 1964 to a grade depth of 5½ ft.

Aids to Navigation.—The approach channel from the North Channel is marked by buoys. Spanish River lighted buoy marks the river entrance.

Little Detroit, Ontario.—This channel separates the northeast extremity of **Aird Island** from the narrow and crooked peninsula of the mainland forming the north and west shores of **Shoepack Bay.** A light is located on the northeast point of Aird Island. The mainland side of the channel is steep, but a shoal makes out from Aird Island between **Mary Island** and **Ethel Rock,** narrowing the channel. Improvements have been made by the Canadian Government by removing a rock north of **Ethel Rock and by cutting the north end off the point** immediately west of Ethel Rock, so as to give a clear channel having a least depth of 16½ feet at low-water datum for a least width of 75 feet. The best water will be found within 40 feet of the excavated point and 65 feet from the north extreme of Ethel Rock. From the point on the north side of the strait, the line of deep water is distant 30 feet and the line of midchannel is distant 75 feet. Northwest of this narrow section the water on both coasts is good.

Killarney Harbor, Ontario.—A narrow strait at the northwest extremity of Georgian Bay, separating **George Island** from the main shore and affording excellent shelter from all winds. The least depth of water in the west entrance channel is 12 feet, and it is marked by buoys along its northerly edge. The village has a small population. The public wharf at Killarney with a freight shed thereon, is 150 feet long with widths of 20 and 40 feet. Approximately 195 feet of mooring space is available for small craft at the northerly face of the wharf. In 1964, additional small craft wharfage and basin was constructed behind the government wharf, with a depth of 6 feet at the face.

Aids to Navigation.—Killarney East Light is situated on **Red Rock Point** (close to which the water is deep), on the north side of the eastern approach to the harbor; a fog whistle sounds as required. Killarney Northwest Light is on the south point of **Partridge Island,** about 1 mile northwesterly from the western entrance to the harbor. The west entrance is marked, in conjunction with the three buoys on the north side of the dredged channel, by a light on a pole located on a small rocky island immediately west of **Le Hayes Point.** At the eastern entrance a buoy marks the northeast edge of **Jackman Rock.**

An automatic marine radiobeacon about 100 feet west of Killarney East Light and transmitting on 298 kHz, sequence 6, is operated during the navigation season only.

Key Harbor, Ontario.—This inlet, at the northeast extremity of Georgian Bay, was formerly a Canadian National Railway coal port, and aids to navigation mark the entrance channel, 21 feet deep, which is not straight and is fringed with shoals. The former ore docks are in disrepair and no iron ore is now handled at this port.

The entrance channel consists of four principal courses, each marked by a pair of steel towers with daymarks; the front one of each range is pyramidal, about 12 feet high; the rear one shows rectangular above the front. A buoy is moored 1¼ miles 200° from Southeast Rock.

Byng Inlet, Ontario.—Located in the northeastern part of Georgian Bay and running about 7 miles from the bay to the mouth of Magnetawan River. The inlet and its approach are marked by buoys placed on shoals that would interfere with 20-foot navigation, and on the sides of dredged cuts, to suit the deep-draft vessels proceeding to the Canadian Pacific Rail wharf. The wharf is 530 feet long east and west, located at the port of Britt in the inner portion of the inlet, on the north shore immediately east of the mouth of Still River and opposite the village of Byng Inlet. The coal-receiving facilities are no longer used and oil storage tanks have been installed on this CPR wharf. The turning area south of the CPR wharf was dredged to a depth of 22 feet in 1967.

During 1948–49 two Government docks were built at Byng Inlet; the one opposite the Canadian Pacific Rail Coal wharf is 96 feet long, 14 feet wide, runs east and west and has 11½ feet depth on the north side; the one approximately 300 feet west of the Magnetawan Hotel is 96 feet long, 14 feet wide, runs north and south, and has 8 feet depth on both sides.

Aids to Navigation.—The outer approach is marked by a buoy moored westward of Magnetawan Ledges and in the alignment of the range lights. A range of lights, with alignment of 074½° leads in to the mouth of the inlet through not less than 20 feet of water. Gereaux Island Light, shown from a steel skeleton tower on the south side of the entrance, is equipped with a fog horn, and with a radar responder beacon (Racon) Morse Code R (. — .). An automatic marine radiobeacon about 265 feet southwesterly of Gereaux Island Light and transmitting on 298 kHz, sequence 5, is operated during the navigation season only. The channel into the inlet is well marked by buoys and leading beacons. The Clark Islands range of lights on alignment of 051° leads into Magnetawan River. In Byng Inlet entrance, to the east of Clark Islands Range, another range of lights on Pinetree Point, a bearing of 076°, is at the mouth of the Magnetawan River. Continuing upriver, Rabbit Island with a light on the southwestern end and a light near the eastern end, is just west of the towns of Byng Inlet and Britt.

Seguin Bank, a detached rocky shoal with a least depth of 12 feet, lies 5¾ miles southwesterly from Red Rock lighthouse having a foghorn and a radar responder beacon (Racon) Morse Code S (. . .). It is just west of the point of departure for Parry Sound and is marked on the southerly end by a lighted buoy. The Parry Sound approach is marked by a lighted buoy located 1 mile southwest of Red Rock light.

Snug Harbour, Ont.—This is a sheltered anchorage for small craft. The entrance is between Red Rock Light house and Snake Bank just north of the approach channel to Parry Sound. There is a depth of about 4 feet in the harbor.

Harbor Facilities.—There is a government wharf 190 feet long, with an L-shaped head 51 feet long. A fish wharf and a private wharf lie adjacent to the government wharf. Small repairs can be undertaken and gas and oil are available.

Aids to Navigation. Snug Harbour Range Lights lead past Three Star Shoal on to Jones Island Range line. The front light is on Walton Island and the rear light is 2,950 feet 070°40′ from the front light. An automatic radiobeacon is operated at this harbour in direct line with the range and 200 feet behind the rear light.

Parry Sound, Ontario.—A town located about midway of the east shore of Georgian Bay, at the mouth of the Seguin River, which empties into the northern end of Parry Sound Harbor. The entrance to the harbor is between Salt Point and Bobs Point, to westward of the river mouth, with a width of 750 feet, which for deep-draft vessels is contracted to a width of 200 feet with 25 feet depth, due to a bank extending from Bobs Point. The western and southerly edges of this bank, marked by buoys, have a depth of 10 feet over rock. In September 1978, the controlling depth in the dredged channel close to Salt Point was 21 feet.

A straight approach in line with the face of Richardsons Wharf, on the east side of the mouth of Seguin River, has been dredged to a depth of 12 feet. The east side of the approach channel is marked by buoys. The harbor basin extends about 1¼ miles southerly from the entrance, and has an area of 370 acres and general depths upward of 90 feet, but the northerly end at the mouth of the river is shoal. There is ample wharfage for handling lumber, coal, and miscellaneous freight, with available depths of 12 to 20 feet. The town wharf extends about 900 feet southwesterly from the west side of the river mouth, with a depth of 21 feet commencing 400 feet from the northwesterly end of the wharf over an area of 1000 feet long by 300 feet wide in line with the face of the wharf. The Imperial Oil Co. wharf on the eastern side of the harbor, southeastward of the town wharf, is 500 feet long, 22 feet wide and has a depth of 25 feet alongside dredged in 1966. A rock with 8 feet of water, marked by a buoy, lies about 900 feet southeasterly from the end of the town wharf and about 600 feet from the east shore of the harbor. A shoal spot with least depth of 12 feet, marked by buoy, lies about 75 feet off the southwest end of the town wharf and about 30 feet east of the line of the face of the wharf.

The Sifto Salt Depot wharf, situated one mile northward of Bobs Point, is 462 feet in length and has a depth of 21 feet. Dredging in 1960 provided a depth of 22 feet in the approaches to the Sifto Salt Depot wharf. The Marine Agency wharf, 175 feet long, is situated over a third of a mile northward of Bobs Point. In a berth 110 feet long, the reported depth is 15 feet. There is a small wooden wharf close northward of the Marine Agency wharf.

Aids to Navigation.—A range of lights marks the dredged cut between Bobs Point and Salt Point. The front light is on the southeast shore of the harbor and the rear light is on the hillside 366 feet 150°19′ from the

front light. A light on Salt Point marks the harbor entrance.

Depot Harbor, Ontario.—A recess of Parry Sound opening into the north shore of Parry Island, on the easterly coast of Georgian Bay, 60 miles north of Collingwood. It is good natural harbor, perfectly safe in all winds and weather, with a depth of 30 to 40 feet and good holding ground in clay.

The main entrance, between the west end of Depot Island and Cadotte Point, is ¼ mile wide and 36 feet deep, and the shores inside are steep-to. Wharves at the east or inner end of the bay are in ruins. One wharf along the north shore, south side of Supply Point, extends to the end of the point, and thence a wharf extension 525 feet long, runs westerly toward the east end of Depot Island, serving also as a breakwater to check the seas entering by the east opening. Another wharf extends along the south shore to a point about opposite the end of Supply Point. The Government landing wharf, extending from the inner end of the harbor between the other two, is 300 feet long with the approach and 150 feet wide. At these wharves from 16 to 21 feet of water will be found. A light marks the western extremity of Depot Island.

Port Severn, Ontario.—At the mouth of Severn River, about 3 miles north of Waubaushene. A channel with least depth of 7 feet leads northward to this port from the point where the alignments of the Sturgeon Bay range and the Waubaushene range intersect, and is marked by numerous day beacons and buoys.

A concrete dam and bridge, forming the western terminus of the Trent Canal (see Trent Canal description under Lake Ontario) extending to Trenton on Lake Ontario, is constructed across the mouth of Severn River. The bridge has a swing span near its western extremity over a lock designed to raise vessels from the level of Georgian Bay to the first pool in the Severn River. The lock is 100 feet long, 25 feet wide, and has 6 feet depth on sills, accommodating vessels 84 feet long with beam not exceeding 24 feet.

Waubaushene, Ontario.—A small village on Matchedash Bay, the easternmost arm in the southeastern part of Georgian Bay, on the Midland division of the Canadian National Railway. On the west side of Waubaushene Harbor, a Government wharf of pilework substructure and concrete superstructure, is 160 feet long, 14 feet wide, and permits the landing of vessels drawing less than 8 feet.

The approach to Waubaushene from Midland and the foot of Georgian Bay is a narrow, crooked, and shallow channel, which should not be attempted without local knowledge.

Aids to Navigation.—Turning Rock Light is in the approach to Waubaushene. Two ranges of electric lights, shown from lanterns on poles, are maintained at Waubaushene, as follows: Waubaushene range lights, located on the flat north of the channel opposite Waubaushene, bearing 094°, leads through the very narrow channel to the inner range of lights, located on the south side of the channel, leading to the Waubaushene wharves. Sturgeon Bay range of lights is on steel towers, on the east side of Sturgeon Bay, west of Waubaushene village, bearing 182¼° leads from the mouth of Severn River to the intersection with the alignment of the Waubaushene range.

Victoria Harbor and Port McNicoll.—These harbors are situated about a mile apart on either side of Hog Bay, an inlet in the southeastern part of Georgian Bay. Victoria Harbor, on the east side of the bay under Bergie Point, is a station of the Canadian National Railway. At the foot of Ellen Street, there is a Government wharf 200 feet long, having a 50-foot approach and a depth of 13 feet. A 60- by 60-foot L-shaped wharf, located at Albert Street, has a depth of 5 feet. Twenty-one submerged cribs in Hog Bay were dredged in 1948, and 11 to 13 feet depth now exists in the west arm. The harbor is protected by the ruins of a breakwater extending 800 feet in a southwesterly direction from the southern part of Bergie Point. The channel into the harbor is not buoyed.

Port McNicoll is a Canadian Pacific Rail terminal on the west side of the bay, with a 10,000,000 bushel capacity elevator, freight sheds, wharves, etc. There is an artificial basin ½ mile long and 600 feet wide between the quay walls. In 1960, there were depths of 19 to 28 feet in the basin.

Aids to Navigation.—Victoria Harbor range of lights, bearing 148½°, indicates a course with not less than 17 feet depth from its intersection with the Midland Point range into the outer end of the dredged channel which extends 209° into the Port McNicoll harbor basin. A buoy marks the northwesterly edge of the Port McNicoll channel at its outer end; vessels should turn close around this buoy in entering. Buoys mark the easterly edge of the channel.

The approach from Midland Point to Victoria Harbor is marked by a range of lights located about ½ mile northward of Midland Point. This range (astern) is held, heading 102°45′, until the Victoria Harbor range is brought on. This intersection of ranges is marked by a three-foot buoy. Port McNicoll range located east of Elimere Point, bearing 152½°, leads from the Bréboeuf range to the Midland Point range clear of all obstructions.

Midland, Ontario.—An excellent harbor, situated in the southwest corner of Midland Bay, southeastern part of Georgian Bay. There are shipbuilding and repair yards, coal docks, and four grain elevators totalling 13,750,000 bushels capacity. Vessels ply regularly to the principal ports of Georgian Bay and North Channel. A marine railway for small craft is located at the Midland Boat Works.

A public wharf 335 feet north of the foot of King Street has a length on the outer face of 557 feet, a width of 65 feet, and a length on the inner face of 350 feet, and the area in front of its outer face has been deepened to 24 feet. Along the shore at the foot of King Street another public wharf, with a large warehouse on it, has a length of 350 feet on its northerly face, along which there is 22½ feet of water, and a length of 140 feet on its westerly end. A wharf midway between the above two is 350 feet long and 65 feet wide, of concrete on sheet piling.

The slips between this and the other two wharves are each 135 feet wide. The north slip had in 1965, depths of 22 feet. The south slip is used as a small-boat harbor; floats are available.

Berths have been dredged to a depth of 20 feet alongside the Canada Steamship Lines and Midland Simcoe elevators and to a depth of 20 feet alongside the Midland (formerly Century) Coal Co.'s wharf.

Midland Bay Shoal, with 9 feet least water, marked by a buoy, lies almost directly in the way of vessels making for the town of Midland, and must be passed to the eastward. A rock with 15 feet of water on it lies westerly 1,050 feet from Midland Bay Shoal.

Tiffin, an important terminal of the Canadian National Railway, is at the mouth of the **Wye River** in the southeasterly angle of Midland Bay where the Aberdeen and Tiffin elevators are located.

The approach to the Tiffin Elevator is through a 300 foot wide channel dredged to a depth of 24 feet in rock. This channel commences approximately 1200 feet southerly from the southerly end of the Aberdeen Elevator dock. The Tiffin Elevator slip, with a governing depth of 23 feet, has a width of 200 feet and extends 150 feet southerly from the end of the concrete wharf. To facilitate vessels backing out and turning when light, the 300 foot wide channel has been widened an additional 400 feet to a depth of 21 feet from deep water to a point 400 feet northerly of the northerly end of the Tiffin dock; thence this widened area narrows up to meet the easterly side of the 200 foot wide slip at a point approximately 160 feet southerly from the northerly end of the dock.

Aids to Navigation.—Tiffin range, maintained by the Tiffin Elevator Company, bears 147°, leading to the Canadian National Railway elevator dock.

Penetanguishene, Ontario.—This town is on the southwest end of **Penetang Harbor** which is on the west side of the southeastern arm of Georgian Bay. It is northwest of Midland, Ontario, and a terminus of the Canadian National Railway. The Ontario Hospital (formerly Provincial Mental Institute) is located on elevated grounds on an old military reserve at the harbor entrance. Good anchorage in 30 to 40 feet of water, with mud bottom and protection from all winds, is found in **Black Bay,** situated north of **Dalton** (formerly **Asylum**) **Point** and southwest of **Sloane Point.** A flat extends about ⅛ mile off the south point of Whisky Island in the outer approach. To pass between **Whisky Island** and Sloane Point, keep the Reformatory Pier Light, at Dalton (formerly Asylum) Point, 230½°.

Harbor.—The inner harbor is a perfectly protected narrow bay or inlet about 3 miles long inside or south of Dalton (formerly Asylum) Point on the east side and **Michaud Point** on the west side of the entrance, with general depths of 18 to 30 feet, mud bottom. Dredging has been done by the Canadian Government to give a channel 100 feet wide and 18 feet deep.

At the entrance, the spits extending out from either point have been cut away, the channel lines being indicated by buoys. On the east side just south of the asylum a flat extends to and around **Magazine Island,** its west edge off the island being marked by a buoy. Farther south, off the tannery, **Middle Shelf** has a depth of but 1 foot ⅛ mile northwest of the end of the tannery dock. A buoy marks the outer end of Tannery Point and a buoy marks the spit off **Wait-a-bit Point** opposite. The approach to the tannery wharf is a dredged channel, 720 feet long, 100 feet wide and 16 feet deep.

Nearing the town farther south, shoals extend out from either side of the bay; **Allen Shelf** is on the east side northwest of Beck's sawmill, and here the 18-foot channel has been dredged to a line 250 feet eastward of the alignment of the range located at the south end of the bay; the channel lines are marked by buoys on the west and east sides. Abreast of the north corner of Beck's wharves, the channel is deflected to bear 155°, the easterly edge running to the northwest corner of the two buoys off the Government wharf, and thence to McGibbon's lumber wharf, with a width of 300 feet. Care should be taken to avoid a dangerous submerged crib on the east side of the dredged channel 1,275 feet north of the light on the Government wharf.

Wharves.—Esplanade wharf is 1,500 feet long north and south with a slight curve inward at the southern part. A depth of 14 feet can usually be carried to the northern part of it, through a dredged cut. A turning basin, 300 feet wide, had a depth of 12 feet in 1958, abreast this part of the wharf; it is marked by a buoy. The greater part of the original wharf is in ruins, but the northern portion, 500 feet in length, has been faced with steel sheet piling.

An arm, 200 feet long and known as the Government wharf, projects from the north end of the Esplanade wharf nearly at right angles to this structure; on the north side of the wharf, the berthing length is 523 feet. The depth in the berths, 350 feet long on the northern side and 220 feet on the southern side, is, when dredging is maintained, 19 feet. In the eastern end of the berth on the northern side, the depth is about 12 feet.

A second Government wharf, 195 feet long, and referred to as the breakwater wharf, projects from the Esplanade wharf, 145 feet southward from the north Government wharf, and parallel to it. A wharf, 330 feet long, extends southward from the outer end of the breakwater wharf with a depth of 17 feet alongside. Inside this wharf are four parallel floats, placed 44 feet apart. Small craft moor here. Water and electricity are available.

A dredged cut, 50 feet wide and 15½ feet deep, forms a slip at the boathouse 200 feet north of the Government wharf. The least depth in the slip for a distance of 250 feet is 11½ feet; the remaining part is very shallow.

Aids to Navigation.—Whisky Island Light is in the outer approach. Asylum Pier Light is at Dalton (formerly Asylum Point) on the east side of the harbor entrance. A light is also located on the southwest corner of the old Government wharf. The town or esplanade wharf is conspicuously illuminated by electric lights.

At the head of the bay, a range of lights bearing 186°, leads through the harbor southward from Magazine Island.

Northwest of the mainland between Penetanguishene

and Collingwood are the **Christian Islands**, a Chippewa Indian Reserve, comprised of Christian, Hope and Beckwith Islands. The most northerly of the group is **Hope Island** having a lighthouse on the northeast point of the island. At this lighthouse, a fog horn and a radiobeacon are operated as required. Christian Island Light, 64 feet above the water, is shown from a white tower on the southeast extreme of Bar Point, Christian Island.

Nottawasaga River, Ontario.—This river enters the southerly end of Georgian Bay about 10 miles east of Collingwood. It is a narrow, fairly deep stream, the lower 4 miles of which flows northeasterly parallel to and within ¼ mile back from the beach. Buoys mark the entrance to the river but local knowledge is required to use the channel.

Collingwood Harbor, Ontario.—Situated on **Nottawasaga Bay**, at the south end of Georgian Bay, and about 94 miles by rail from Toronto. It is an important station of the Canadian National Railway, and the starting point of steamers for Owen Sound, Sault Ste. Marie, Parry Sound, etc.

Breakwaters.—The harbor is artificially inclosed by breakwaters on the east and northwest. The east breakwater extends about 2,800 feet from the shore in a northwesterly direction, and the L-shaped west breakwater extends about 2,600 feet to the northeast and east, its outer end being 1,350 feet northwest of the end of the east breakwater. The inclosed harbor has an area of 267 acres, but is very shallow except in the dredged channels below described. There being no anchorage space, vessels must tie up to the wharves, located principally in the southeast corner of the harbor; with good lines they are safe in any gale, although considerable sea rolls in through the wide entrance between the breakwaters.

Channels.—The entrance channel has been redredged to a depth of 21 feet in 1974 and is well outlined by buoys. The channel enters on a southerly course passing near the end of the West Breakwater and shortly thereafter slants easterly to meet the elevator Terminal Wharf. The channel tapers from a width of 300 feet at the 21 foot contour outside the West Breakwater to a width of 230 feet opposite the breakwater. The easterly side of the channel starts to slant towards the Terminal Wharf 500 feet inside the West Breakwater. The westerly side of the channel runs parallel to the range line from the West Breakwater to meet the turning basin, the intersection being opposite the end of the Terminal Wharf. The turning basin opposite the Collingwood elevator was dredged to depth of 21 feet in 1974 and has a radius of 800 feet centered at the extreme west end of the Terminal Wharf. The inner harbor between the town dock and the easterly end of the mooring stations and up to the entrance to the dry docks was dredged to a depth of 17 feet in 1967. To the west of the dry dock a wharf 342 feet long dredged alongside to 17 feet, known as West wharf, makes out in a northwesterly direction. The depth at the outer end is 16 feet. The inner harbor, east of a line from the mooring stations to the entrance to the dry docks, including the East wharf, had a controlling depth of 13 feet in 1967.

A channel 100 feet wide with a depth of 10 feet in 1968 extends from the main channel, at a point near the front light, to the wharf of the Imperial Oil Co. on the west side of the harbor.

Lockerbie Rock, with least depth of 13 feet, lies close to the northerly prolongation of the range line in the approach to the harbor; a buoy is moored in 24 feet, 1,500 feet 284° from the middle of the rock.

Aids to Navigation.—The outer approach to the harbor entrance channel is marked by a range of lights. The front light is on a tripod aluminum lattice tower on the north extremity of Sunset (formerly Fisherman) Point. The rear light is on a steel skeleton tower, 3,321 feet 150¼° from the front light, the alignment leading between the Mary Ward Ledges and Lockerbie Rock to the intersection with the shore range in the harbor. A buoy is located westward of the point of intersection of the two ranges.

The shore range marks the line of the entrance channel leading from the range intersection in to the curve into the harbor channel. The front light is on a lattice tower, 1,925 feet northwesterly of the Town Dock. The rear light is on the mainland 1,750 feet 180°45′ from the front light.

A ship calibrating radiobeacon at Collingwood is available for the calibration of ship direction-finders on request through Wiarton Marine Radio/VBC. A sequenced 298 kHz radiobeacon, code "C", at Collingwood is also operated during the navigation season.

Dry Dock.—The Collingwood Shipbuilding Co. operates an extensive plant for the construction and repair of large vessels, with a dry dock, situated in the extreme southeast corner of the harbor, having dimensions as follows: Dock No. 1.—Length, 518 feet over all, 480 feet on blocks; width, 78 feet at top, 60 feet 3 inches at bottom, 56 feet 9 inches at gate; depth over sill, 15.5 feet.

Thornbury, Ontario.—At the mouth of **Beaver River**, south shore of Georgian Bay 8 miles southeasterly from Meaford and 19 miles northwesterly from Collingwood. The harbor has an area of about 4 acres, protected by breakwaters at the entrance, with an entrance channel 100 feet wide. The depth in the harbor and channel is about 12 feet and a vessel 150 feet long can turn around inside on this draft. The wharf on the southwest side of the harbor is 600 feet long, with 12 feet depth.

Range lights lead through the middle of the dredged channel to the west breakwater pier. The front light is mounted on a structure approximately 11 feet from the outer end of the west pier; the rear light is on the west side of Beaver River 376 feet 214° from the front light, and shown from a steel pipe tower.

Meaford, Ontario.—In Nottawasaga Bay, southern end of Georgian Bay, at the mouth of **Bighead River**, midway between Owen Sound and Collingwood; a terminus of the Canadian National Railway.

This is an artificial harbor, formed by the east breakwater, extending about 1,150 feet from shore in a northerly direction, coupled with the north breakwater extending westerly about 450 feet. Between the westerly end of the north breakwater and shore is located a rubble mound

checkwater extending some 350 feet out from shore. The sheltered harbor area consists of about 9 acres with a limiting depth of 13 feet in 1975 and is subject to siltation. Small craft repair facilities were available in 1975.

A 300-foot wide entrance channel, marked by buoys, leads around the westerly end of the north breakwater, marked by Meaford Breakwater Light, 20 feet above the water, on a cylindrical white concrete pillar, thence along the southerly side of the breakwater, thence in a southerly direction into the harbor basin. Inside this basin, the river has been dredged to a depth of 5 feet, the width varying from 50 to 100 feet. The surrounding coast is clear of rocky islands and reefs. There is good anchorage in 30 to 50 feet, and protection from southeast through south to northwest winds, with mud bottom, anywhere north of the harbor to Cape Rich, 7½ miles distant.

Danger Area.—A Canadian Land Forces Exercise Area (CYD501) is located north of Meaford and extends in a northeasterly direction over the water from the surface to an elevation of 15,000 feet in the area 44°42′50″ N., 80°46′20″ W.; 44°46′32″ N., 80°49′42″ W.; 44°48′37″ N., 80°46′21″ W.; 44°48′27″ N., 80°37′28″ W.; 44°42′47″ N., 80°31′38″ W.; 44°39′50″ N., 80°37′38″ W. This area is only in use intermittently and the period of use will be announced by local Dept. of Transport "Marine Radio Broadcasts" and may also be advertised in local newspapers.

Owen Sound, Ontario.—Located at the mouth of Sydenham River, head of Owen Sound, the southwest end of Georgian Bay. It is an important shipping point, having a 5-million bushel capacity grain elevator and with extensive and varied manufacturing interests.

Harbor.—The entrance channel had a depth of 22 feet in 1975. It has a width of 500 feet centered on the range line at the commencement and tapers to 240 feet between the East and West Piers.

The harbor basin is an enlargement of the river, formed by cutting away the bank on the West Side for about ½ mile above the mouth. The maximum width in front of the grain elevator is 700 feet and narrows to 100 feet at the upstream end. The harbor area extending from the entrance piers to the North End of the Canadian National Railway Company's shed was dredged to a depth of 22½ feet in 1964; the adjoining area extending to 200 feet southerly of Eleventh Street West was redredged to 18 feet in 1964.

Stations, yards, and freight sheds of the Canadian National Railways are located on the west side of the harbor, and those of the Canadian Pacific Rail on the east side. Government wharfage amounts to 2,200 feet on the east side and 1,245 feet on the west side of the harbor for ships of 22½ feet draft or less; additional wharfage for smaller ships with drafts of 18 feet and under approximates 1,525 feet on the east side and 1,138 feet on the west side of the harbor. A private dock, 350 feet long, owned by the Great Lakes Elevator Co. Ltd., is located on the west side of the harbor. Sixteen pile clusters were installed in 1963 for winter berthing on the west side of the harbor.

On the East Shore of Owen Sound about 4,000 feet northerly of the entrance piers is located the marine railway and plant of Russell Brothers Limited, builders, metal fabricators, marine specialists. The marine railway has a capacity of 110 tons deadweight with an overall length of 120 feet. The approach to the slip and marine railway is by way of a 60 foot wide channel dredged to a depth of 15 feet in 1964.

Lights.—Two lights are situated on the east harbor wall; a radio beacon is operated at the front light. This range, bearing 195°, leads to the harbor entrance; it may be brought on as soon as seen and kept until the front light is 900 feet distant, then haul over into the basin, leaving both lights to port.

The outer end of the west pier at the entrance is marked by a light. The outer end of the dredged entrance channel is marked by buoys on the east and west sides.

Good anchorage is found off Brooke (on the west shore of the bay) in 35 to 40 feet, mud bottom, where a vessel with good ground tackle could safely ride out a heavy northeast gale.

Wiarton, Ontario.—Situated at the head of Colpoys Bay, a fine inlet on the west side of Georgian Bay, about 32 miles north of Owen Sound. It is a terminus of the Canadian National Railway. The Government wharf or breakwater is 700 feet long, extending from the westerly shore 600 feet 118°, thence 100 feet 160°. There are also landing docks inside of the breakwater. The depth at the breakwater wharf is about 15 feet.

About 1,900 feet southeasterly from the former town wharf following the shoreline, a new 720-foot-long Government wharf was constructed during 1959, extending from the shore 230 feet 033°, thence 220 feet 072°, thence 270 feet 130°. The depth at the wharf is about 5 feet. There are three light standards on the wharf and two light standards on the approach.

Wiarton Light is 27 feet above the water on a mast on the outer end of the government wharf.

Radio Facility.—A Marine radio station at Wiarton (call sign VBC) is operated continuously during the navigation season. Extended range ship-shore VHF transmitting and receiving facilities at Meaford, Ont. and Tobermory, Ont. are remotely controlled from this station.

Colpoys Bay.—Wiarton is 9 miles from White Cloud Island, which, with Hay Island, shelters Colpoys Bay from the heaviest seas of Georgian Bay. The breadth of the bay is 3 miles at the mouth and ¾ mile at the head in front of the town. The shores are marked by limestone cliffs, 330 feet high, diminishing to about 200 feet near Wiarton. There is excellent anchorage in any depth under 60 feet from abreast of the village of Colpoys, 2½ miles north of Wiarton, to the head of the bay opposite the breakwater light, comprising an area of about 2 square miles. Colpoys Bay Light is on a wharf at the village of Colpoys. A buoy marks the south side of a sunken scow.

Wreck.—A wreck is located about 600 feet south of the outer end of the government wharf.

Lion's Head Harbor, Ontario.—On the west side of Georgian Bay, about 19 miles by land and about 39 miles by water northwest of Wiarton. The harbor is about ¼ mile square, with general depths of 5 to 20 feet, and

is partly sheltered from northerly gales by a breakwater wharf extending southeasterly from the shore about 450 feet and thence easterly 200 feet. Beyond this a submerged portion of the old breakwater extends 50 feet. A buoy marks the extremity of the submerged portion. It is no place for any but small craft, for which there are landing accommodations near the inner part of the breakwater, with a dockage face of 450 feet. The protected basin in the immediate vicinity of the breakwater has a depth of about 14 to 16 feet. In the northeast corner of the harbor basin a 10-foot wide by 30-foot long launching ramp is provided for tourist craft.

From the village the east shore runs straight northeast for 2 miles to a promotory called Lion's Head, from which a reef makes out 1,200 feet; as the bottom is very rough, care should be taken to avoid it.

Light—A light is located 80 feet in from the outer end of the breakwater.

Surprise Shoal, a detached rocky bank with a least depth of 5.0 feet, is located about 7½ miles 335° from Cape Croker lighthouse very near the normal sailing course southerly from Cabot Head to Cape Croker. It is marked on the westerly end by a buoy.

Tobermory Harbor, Ontario.—Situated at the northwest extremity of the **Bruce (Saugeen) Peninsula,** near the Georgian Bay entrance. The harbor consists of the Eastern Arm or Little Tub, and Southwest Arm or Big Tub, affording perfect shelter from all winds. The latter arm extends from Lighthouse Point southwesterly ½ mile, with an average breadth of 300 feet. The low limestone shores sink almost perpendicularly to depths of 40 to 50 feet, which depths, over soft mud, will be found all over this arm excepting near the southwest end, where a sandy flat runs out 400 feet to a depth of 18 feet. As the arm is too narrow for vessels to lie at anchor conveniently, they are compelled to tie up to ringbolts sunk into the rocks, and floating booms 500 feet long on the north side and 400 feet long on the south side are provided to protect them from the sharp edges. Across the inner end of the Eastern Arm there is a steel pile wall backfilled so as to form a landing wharf 200 feet long and 4½ feet above water, with depth of 5 feet in front of the wharf. Three timber small-boat landings, consisting of timber superstructure on concrete piles, each 81.6 feet long, 6 feet wide, and with deck 4½ feet above water level, extend into the harbor at right angles to the face of this wharf and adjacent to this steel pile wall on the west side of the arm is a timber crib wharf 300 feet long with depths of 7 to 14 feet along the face. A steel sheet pile wharf on the east side of the eastern arm is 253 feet long, with gravelled area behind, with grade 4½ feet above the water. Depths in front vary. A ferry terminal is in the vicinity of the existing wharves on the west side of the entrance to Eastern Arm. The terminal wharf is 250 feet long with a mooring dolphin, marked by a private light, off its northwest end. Gas, water, and power are available in Little Tub.

Aids to Navigation.—At the north entrance to the Southwest Arm there is a lighthouse. There are no dangers in the approach to this harbor, and when the light is visible it may be approached with confidence, day or night. Another light marks North Point. A black spar buoy is about 500 feet 176° from this light.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is located in Tobermory.

Section VIII.—East Shore of Lake Huron From Cape Hurd to St. Clair River

Charts of Canadian waters are prepared by the Canadian Hydrographic Service, Department of the Environment, Ottawa, Canada

Charts 14860, 14862.—From Cape Hurd to Lyal Island, Ontario the coast is rocky and dangerous within 2 miles of shore, and vessels should be careful in thick weather or at night not to shoal to less than 60 feet. The water in **Baptist Harbor** is shallow. **Arbutus Rock,** with 15 feet depth, is situated about 1¾ miles westerly from **Baptist Island,** with another 15-foot spot about halfway between it and the island, and **Baptist Rock,** with 16 feet depth, lies about ⅝ mile southerly from Baptist Island. There is good depth close to shore between Baptist Island and **Hopkins Bay;** a deep area at the inner end of this bay is cut off by a shoal with 12 feet least depth, and the southeast shore of the bay to **Hopkins Point** has a shoal with less than 6 feet depth extending out ½ mile. The same character continues eastward from Hopkins Point to **Warner Bay,** where anchorage in 20 to 30 feet is found. **Eagle Harbor** is generally shoal, with spots of less than 6 feet depth **Dorcas Bay** has depths ranging from 8 to 24 feet close to its northwest shore, but is so generally foul as to be useless.

The coast thence to **Little Eagle Point** is generally deep to within ⅜ mile from shore.

Little Eagle Point to Pine Tree Point.—Campbell Reef, with least depth of 9 feet, lies with its easterly end southwest ⅞ mile from **Little Eagle Point,** extending thence in the same general direction ¾ mile. **Little Eagle Harbor** is a small but good boat harbor to which 16 feet may be carried through a narrow channel by heading northeasterly on **Coal Oil Point** (the southeast entrance point) and passing close to its northwest side. **Porcupine Reef,** with 9 feet depth at its outer end, extends ¾ mile southwesterly from **Porcupine Point,** and **Cataract Rock,** with 15 feet, detached and on the same line, is about 1 mile from the point. About ½ mile north of the passage between Porcupine Reef and Cataract Rock is a shoal area with least depth of 13 feet, and another shoal spot with 15 feet depth lies off the entrance to **Corisande Bay,** to the south of the reef and about ¾ mile southwesterly from Porcupine Point. From the southerly point of the southeast shore of Corisande Bay, a shoal with 13 feet at its outer end extends to the west about ⅝ mile. **Huntress Reef,** with less than 6 feet of water, extends ½ mile southwesterly from Johnston Point.

Johnston Harbour is a small, well-sheltered cove, affording limited anchorage within the entrance between **Johnston** and **Terry Points.** A detached shoal with 17 feet least depth lies 1½ miles northwest from **Deadman Point.**

Pine Tree Harbour to Greenough Point.—Gilphie Reef,

with 13 feet least depth, is ½ mile southwesterly from Pine Tree Point and off the entrance of Pine Tree Harbour; 8 feet may be carried to the sawmill wharf on the west shore of this harbor just inside the point through a narrow channel, marked by buoys, between very shallow rocks. A 035½° lighted range leads into Pine Tree Harbour. **Little Pine Tree Harbour** is well sheltered and good for small craft drawing not more than 5 feet. A shoal spot with 13 feet depth lies ⅝ mile southwesterly from **Juno Point.** Both this shoal and Gilphie Reef are detached from the shoal water extending offshore from ¼ to ½ mile between Pine Tree Harbour and **Pleasant Bay.** Lying outside the shoal water of Pleasant Bay are detached spots with 15 feet least depth, the most westerly being ⅞ mile southwesterly and the most easterly ¾ mile south of **Pleasant Point.** A detached 16-foot spot lies 1⅜ miles northwesterly from Scotch Thistle Point.

Greenough Bank is an extensive shoal 2¼ miles long north and south and ⅞ mile wide, with depths varying from less than 6 feet up to 15 feet; its north end bears ⅝ mile northwesterly from **Scotch Thistle Point,** and its south end 1½ miles westerly from **Greenough Point.** There are detached spots with 11 or 12 feet to the southeast of Greenough Bank, and **Cornet Ground,** on which there is 7 feet of water, with its northeasterly end 1¼ miles southwesterly from Greenough Point, extends ¾ mile in a southwest direction, with other spots extending thence southerly to the north entrance into Stokes Bay. The western boundary of the shoal area from and including Greenough Bank to this entrance is on a north and south line about 1¾ miles west of Greenough Point, the southern end being marked by a buoy on the edge of the entrance channel.

Stokes Bay.—The channel into Stokes Bay is well defined by buoys at the outer end and by range lights at the inner end. The front light is on the northwest extreme of the most westerly of the **Knife Islands,** a group of small islands lying ½ mile north of McMaster Point (the northeast point of **Lyal Island**). The rear light is on the east mainland shore of the bay, 4,000 feet 068°55′ from the front light. The range leads in from the lake to within 1,800 feet of the front light, with a least depth of 18 feet. Buoys mark the channel to the wharves. Mariners approaching the entrance at night should bring the lights in range at least 2½ miles outside of Lyal Island and keep them so until the anchorage north of Lyal Island is reached, where there is a depth of 24 to 36 feet over mud, with good shelter. Mariners without local knowledge should not attempt to reach the wharves at night. Lyal Island Light is situated on the west side of the island and serves as a guide to Stokes Bay.

A buoy on the north edge of the channel northwest of the northwest corner of Lyal Island marks the southwesterly end of **Mad Reef,** which extends thence northeasterly ⅞ mile, where it is 3 or 4 feet out of water and almost joins the southeast corner of the shoal water extending southward from Greenough Point. A detached spot in the anchorage ground to the eastward of the exposed portion area of Mad Reef has a depth of 15 feet. There is an area of deep water farther in the bay, the entrance to which from the above anchorage ground is narrowed by shoals extending southward from **Ferguson Point** and northward from **McMaster Point** of Lyal Island. From the entire east shore of Lyal Island, shallow water with scattered spots of less than 6 feet depth extends northeastward to the main shore. The northerly limits of **Ripple Reef,** extending west from Lyal Island, as well as **Saturn Rock** and other detached spots in the same locality, having depths of 7 to 12 feet, are marked by the buoys on the south edge of the entrance channel into Stokes Bay.

There is a Government wharf at the head of Stokes Bay, about 3,300 feet westward from the mouth of Stokes River, with a berthing space of 150 feet and a depth of 6½ feet at the outer end. Gasoline and oil are available at the wharf.

The coast from Lyal Island to Chiefs Point, Ont., including the Fishing Islands, is unsafe in this region for a distance of 3 miles offshore. **Wanderer Shoal** has 10 feet least depth at its northerly end, which lies ⅞ mile southwest from Lyal Island Light. A 15-foot spot is close westward of this shoal. **Lyal Reef** is a long, shallow spit extending 2¼ miles in a general southwesterly direction from the south end of Lyal Island, with depth of less than 6 feet near its outer end.

Murton Reef, with 5 feet, east of the south end of Lyal Reef, lies directly in the entrance to the deep water which extends in a northeasterly direction easterly of Lyal Reef and Lyal Island; this deep water has depths of from 18 to 40 feet extending up to nearly abreast the south point of **Parker Island.** The shallow bank between this deep area and the main shore varies in width from about 1½ miles at the southern end abreast **Little Pike Point** to ½ mile at the north end. To the south of this bank and of Murton and Lyal Reefs, deep water with depths ranging from 20 to 30 feet extends inward toward **Little Pike Bay** to a point south of Little Pike Point; in this deep water are detached spots with 14, 18, and 12 feet of water over them, lying respectively 1½ miles west 1¾ miles southwest, and 1¼ miles southwesterly from Little Pike Point. Good but limited anchorage for small craft can be had off the sawdust point on the south shore of Little Pike Bay, in 18 feet, but not more than 8 feet can be carried in through a narrow, crooked channel with a sharp turn in it.

Little Pike Bay to Pike Bay.—The north end of **Lincoln Shoal,** with 14 feet depth, bears 1¼ miles southwesterly from Little Pike Point, the shoal extending thence to the south a distance of 1¼ miles, with least depth of only 1 foot. **Wells Shoal,** with least depth of 13 feet, lies westerly off the south end of Lincoln Shoal. From the westerly point of the southeastern shore of Little Pike Bay, a foul bank with very scant water at its outer end makes out in a southwesterly direction to within ⅛ mile of Lincoln Shoal, and a narrow spit with 6 feet least depth extends ¾ mile southerly from the outer end of this bank. There is not less than 18 feet in the deep channel between Lincoln Shoal and the bank and spit, as well as in an area lying to the east of the spit. A bank with 7 feet least depth extends southwesterly from the shore ½ mile southeast of

Purgatory Cove, its outer end approaching to within ⅛ mile of the south end of the spit above mentioned. A strip of deep water extends in to within ½ mile of the main shore and south of a line joining the southern ends of Lincoln Shoal, the spit, and the bank from the main shore; there is 18 to 30 feet with rock bottom in this strip, which connects with the deep water on the east and west sides of the spit.

A shoal with detached spots and a depth of less than 6 feet extends from the shore to within a short distance of **Barrett Reef,** awash, lying about 1½ miles west of **Pike Point;** between Barrett Reef and **Milton Bank,** which has a depth of about 1 foot and bears northwesterly 2 miles from **Pike Point,** there is a depth of 24 to 36 feet, and the same depth extends along the south side of Barrett Reef and the bank from the shore to within ¼ mile southwesterly of Pike Point. South of this deep area a shoal bank, with exposed rocks and scant water generally, extends from the shore a distance of 2¾ miles, embracing **Chimney Reefs, Harrison Shoal** (detached), and **Hattie Rock** The anchorage ground to eastward inside of this extensive shoal and westward off Sucker Creek and **St. Jean Point** is filled with detached spots having 9 to 14 feet of water over them, and **Drake Shoal,** directly in the entrance of this anchorage ground, about 2 miles westerly from St. Jean Point, has least depth of 8 feet. The narrow passage, 150 feet wide, south of Drake Shoal is buoyed.

From Pike Bay Southward to Chiefs Point the coast is completely filled by the **Fishing Islands,** which are surrounded by reefs and shoals having less than 6 feet depth in places and extending generally 3 miles from shore. There are several good anchorages in the group, to wit: A small area northerly from **Beament Island,** in 18 to 20 feet of water, to which 24 feet may be carried through a very narrow channel; a limited space about ¼ mile southeast of **Burke Island,** to which 10 feet can be carried; between **Scout Reef** and **Scotch Bonnet Island,** a lane of deep water leading nearly up to **Basswood Island;** ¼ mile east of **Whitefish Island,** a small anchorage in 12 to 18 feet over mud, but with only 10 feet leading in. In thick weather or at night vessels approaching the shore anywhere between Cape Hurd and Chiefs Point should not shoal to less than 60 feet. The channel inside Smokehouse Island is marked by a range of lights.

Between Chiefs Point and **Sauble River** the coast is foul and should not be approached within ¾ mile. Two leading beacons, on the north side of the river mouth, in line bear 016°. From Sauble River to Frenchman Point the shore forms a broad, open bay, which is fronted by a clean sand beach ½ mile wide reaching to within half a mile of **Frenchman Point,** where boulders again appear.

From the southerly point of the shore of **Frenchman Bay** a shoal with 8 feet depth extends northwesterly ¾ mile. From this point to Southampton the shore is mostly a low boulder beach and may be approached within ½ mile; the south end of this stretch, however, is obstructed by **Lee Bank,** between which and the shoal along shore is a deep channel from ⅝ to ⅝ mile wide. **Lee Bank** has least depth of 2 feet, its southerly end lying northwesterly 1⅛ miles off the mouth of Saugeen River at Southampton, from which point it extends, including detached spots, northeasterly 2½ miles. **Lambert Shoal,** with least depth of 7 feet, is situated about ¾ mile northwesterly of the light at the entrance of Saugeen River; the range line just clears the south end of the shoal.

Chantry Island Shoal runs in a northeasterly and southwesterly direction 2¾ miles, **Chantry Island** being located at about the middle of its length; there is a depth of 6 feet at the north end of the shoal, and of less than 6 feet at the south end. A buoy is moored in 22 feet of water off the north end of the shoal. The south end is marked by a buoy, with deep water close south to it.

Southampton Harbor, Ontario.—At the mouth of Saugeen River, east of Chantry Island; it is a terminus of the Canadian National Railway.

Outer Harbor—Breakwaters.—The old harbor of refuge in the lake comprises a shallow area between Chantry Island and the mainland, to the southwest of the mouth of Saugeen River. It is exposed to the southwest and is inclosed on the north by two curving breakwaters, bowed to the north, respectively extending 2,260 feet easterly from the north end of Chantry Island and 2,300 feet westerly from the mainland, with opening of 450 feet between their outer ends. The breakwaters have been partially demolished and abandoned and the remains are for the most part, submerged. Entrance to the Roadstead is through a 400-foot gap separating the old headblocks of the structures and is marked with buoys on the west and east sides. Mariners are warned not to pass over the submerged sections of these structures, as these sections have only about 1½ to 2 feet of water over them. The present Government maintenance is confined to the works at the mouth of Saugeen River. The depth leading into this harbor is about 12 feet. Owing to the heavy surge that prevails with all onshore winds, no vessel can remain tied to the breakwaters, and the anchorage space is limited to a small area under the west breakwater. Berthage farther south is obstructed by numerous boulders, the worst one, with 8 feet of water on it, lying 750 feet off and a little northeast of the line of trend of the Canadian National pier (in disrepair and abandoned) on the mainland opposite the island.

Aids to Navigation.—McNab Point (formerly Southampton) Light is on the shore south of the landing pier. A marker radiobeacon on a frequency of 306 kHz is operated at McNab Point Light. Chantry Island Light is located on the east side of the island.

Saugeen River—Lights.—At the mouth of Saugeen River, the breakwater or north pier is 692 feet long and the south or landing pier and training wall is 1,027 feet long. The entrance channel for a width of 100 feet and the inner harbor for a width of about 250 feet from the landing wharf on the south side had available depths of 14 to 15 feet in 1960. The dredged channel is marked by buoys; spring freshets sometimes change the channel. A buoy marks the turn on to the Saugeen River range lights, the front light on and near the end of the north breakwater, and the rear light on the hillside 2,371 feet 095¼° from the front light leads in to the mouth of the

Saugeen River. An electric tyfon foghorn at the front light sounds as required. Gasoline, diesel oil, water, and power are available at entrance to the river.

Port Elgin, Ontario, is located in a bight 4 miles south of Chantry Island. Generally deep water exists within ½ mile of the intervening shore, but there are obstructions to westward off Port Elgin, as mention further on.

Harbor.—The harbor is protected from westerly winds and seas by a breakwater extending 1,635 feet in a southerly direction from the northeast shore of the bay, with an entrance gap 80 feet wide at a point 650 feet from the north end. The harbor space is about 600 feet wide and has been dredged to a depth of 10 feet. A concrete landing wharf 417 feet long is built along the east side of the harbor, with a small boat basin inside its northern end. Power, gasoline, and water may be obtained at the wharf. Depths of 5-9 feet were found along the western face of the wharf in 1959. The entrance to the harbor from the south is now completely closed. The present entrance channel from the west is 100 feet wide and 8 to 10 feet deep.

Aids to Navigation.—The entrance is marked by range lights; the front light, shown on a pole, is on the wharf about 60 feet from its north end, and the rear light, shown from a galvanized steel tower, is 528 feet 109° from the front light. Buoys mark the south side and the north side of the outer entrance.

Off Port Elgin, **Logie Rock,** with 10 feet least depth, is marked at its northeast corner by a red buoy showing a flashing red light, on the range line northwesterly 2¼ miles from the Port Elgin Front Light. From the mainland trending southwesterly between Port Elgin and **MacGregor Point,** several long and very shallow spits, including **Dack Spit** and **Malcolm, Boyer, and Belcher Reefs,** extend northward a distance of 1¾ miles; the most westerly one approaching close to the southern end of Logie Rock and leaving a narrow channel obstructed by detached spots of 15 to 18 feet depths. Shallow water, with 6 to 12 feet depth, extends out ¾ mile off and around MacGregor Point, continuing southwestward past **Scougall Bank,** which extends out a distance of 1 mile, and past **Welsh Bank,** which extends out 1¼ miles. From Scott Point, the northerly point of the indentation called **Baie du Dore,** lying northeastward of **Macpherson Point, Loscombe Reef** extends to the west for 2 miles, with only 8 feet depth near its outer extremity.

From **Macpherson Point** southward around **Douglas Point,** to 2½ miles below **Kincardine** entrance piers, the shore is regular, the shallow water along this stretch varying in width from ¼ to ¾ mile. The four stacks of the nuclear power station at **Douglas Point** are conspicuous. At **Inverhuron,** 9 miles north of Kincardine, there is good holding ground in depths of 24 feet, and protection from north, east, to south winds.

Kincardine, Ontario.—Situated at the mouth of the **Penetangore River,** 9 miles northeast of Point Clark and about 30 miles to the northward of Goderich. It has several important industries and a terminus of the Canadian National Railway.

The **Harbor** consists of an inner basin of about 3 acres, into which flows the Penetangore River, the entrance to the basin being protected by two piers from 90 to 130 feet apart. A cribwork and concrete breakwater 603 feet long northeast and southwest is located 825 feet northwesterly from the west end of the north pier. The north side of the basin is formed by the inner end of the north pier, which has a total length of 1,500 feet from its outer end to its inner end at the bridge across the river immediately above the basin. The east, south, and west sides of the basin are formed by a steel sheet pile retaining wall, starting at the bridge, running 55 feet along the southerly side of the river, thence turning and running southward 420 feet along the east of the basin, thence westward 257 feet along the south side of the basin, and thence northward 455 feet along the west side of the basin to where the south pier proper begins. The south pier is 935 feet long, all of which has concrete superstructure. Two steel sheet pile and concrete wave dissipators were constructed in the entrance channel in 1973. These extend into the channel from the south pier and are marked with fluorescent paint. A 100 foot long rubble stone breakwater was also constructed at the juncture of the south pier and the inner basin, extending easterly.

Gasoline and water may be obtained from berths in the inner harbour, one on the north pier and the other on the east wall of the basin.

The harbor is subject to shoaling by silt from the river and also by the formation of a bar at the entrance extending from the south.

Soundings indicated a depth of 6 feet in the channel between the entrance piers and 6 to 7 feet in the basin.

Aids to Navigation.—The entrance is marked by a 104½° lighted range. A fog signal is at the front light, which is shown from a tower with a white diamond-shaped daymark. The daymark is difficult to distinguish from seaward in daylight. The main light is on the hillside in the town. The town waterworks building is a conspicuous white brick building with a high stack, 1,375 feet north of the harbor entrance.

Water Intake.—The Kincardine water intake pipe, 16 inches in diameter, extends lakeward 2,225 feet from shore at a point 1,250 feet northerly of the inner end of the north pier. At its outer end is a crib about 15 feet square with 15 feet of water over it, lying 1,250 feet northwesterly from the southwest corner of the breakwater.

Chart 14862.—At a point 2½ miles southwest of Kincardine and 6½ miles northeast of Point Clark, the offshore shoal area increases in width, and reefs and detached spots make out for 1½ to 2 miles, continuing around the point and diminishing toward **Port Albert,** 13 miles south of it. The outlying depths in this stretch generally range from 10 to 18 feet, but about 1 mile westerly from Point Clark is **Clark Reef,** a pile of boulders having only 2 feet of water on it and marked by a buoy.

Point Clark Light is on the extremity of the low point.

Port Albert is an abandoned harbor at the mouth of the **Lucknow River,** 11 miles north of Goderich. The piers are disintegrating and a gravel bar at the entrance at

times shows above the water surface. Between Port Albert and Goderich the shore should be given a berth of ⅞ mile.

Goderich Harbor, Ontario, is at the mouth of the Maitland River, about 60 miles northeast of the head of St. Clair River. It is a terminus of the Canadian National Railway and the Canadian Pacific Rail. The harbor of refuge consists of an inclosed basin about 25 acres in extent, lying to the south of the Maitland River near its mouth; the river does not flow into the harbor, but is cut off by a concrete and cribwork breakwater 2,500 feet long.

Good anchorage may be found off the piers in clay bottom, but none in the harbor, which has rock bottom. Two large grain elevators, situated on the southeast side of the harbor, are the most prominent buildings in Goderich. The electric lights of the town are more conspicuous from the lake than is the light shown from the main lighthouse.

Breakwaters.—The northwest breakwater is 1,500 feet long and 35 feet wide, with concrete superstructure reaching about 8 feet above the water surface, running in a northeast and southwest direction on the north of the prolongation of the channel between the piers; its outer or southwest end is 2,177 feet from the south pierhead.

The southwest breakwater, to the southward of the harbor entrance, is composed of concrete cribs and mass superstructure. The outer end of this structure is 550 feet 146°30′ from the outer end of the northwest breakwater, and it extends thence 1,400 feet 132°. A light and a fog horn are located at the west end of the south breakwater.

Piers—Channel and Basin.—Two approximately parallel piers protect the entrance to the inner harbor, which is an artificial channel about 700 feet south of the mouth of the river. The north pier is 1,585 feet long and extends about 400 feet beyond the end of the south pier, which, starting from the basin, is 1,600 feet long. The width between the piers is 185 feet, except at the outer 100 feet length of the south pier, where an angle increases the width. The mooring wharf across the westerly end of the inner harbour was reconstructed in 1968. A new steel sheet pile wharf approximately 303 feet long was constructed in the easterly corner of the inner harbour basin in April 1974.

Gasoline and water may be obtained at a boat livery on the south pier and at a marina in the northwest corner of the inner harbour.

Soundings taken in 1965 indicate controlling depths as follows: 24 feet of water in the outer entrance channel between the breakwater gap and the ends of the north and south piers; 23 feet along the outer section of the south pier along the edge of the dredged channel. There was a least depth of 19 feet between the piers reported in 1971.

Dredging was completed in 1963 providing a controlling depth of 23 feet in the inner harbor. There was a depth of 19 feet reported in 1971. Ship Island has been removed.

Aids to Navigation.—Goderich Main Light is located on the high bank south of the harbor entrance. The outer end of the southwest breakwater is marked with a light and an air fog horn sounding as required. A light marks the southwest end of the northwest breakwater.

The range for entrance consists of two lights; the front light is on the north pier and the rear light is on the beach 607 feet 087° from the front light. A second light, visible over 360°, is mounted on the front light structure, above the front light. The range leads through the gap between the breakwaters 150 feet south of the northwest breakwater light; follow the range until about 700 feet from the front light, then change course so as to pass midway between the piers. A combination marine-aviation radio-beacon, transmitting on 286 kHz, is operated continuously through the year.

Twelve incandescent electric lamps, on poles 18 feet high on the south pier of the harbor entrance, are conspicuous from lakeward at night and plainly mark the location and the direction of entrance between piers. Fifteen incandescent lamps on poles 25 feet high are located along the north side of the inner harbor; a powerline also runs along these poles for the use of ships wintering there.

Canadian Customs.—See Canadian Customs Regulations under Chapter 1, preceding. A vessel reporting station is located in Goderich at the government dock.

Waterworks Intake.—The abandoned waterworks intake pipe at Goderich runs from a point on shore, south of the Goderich freight shed, in a direction 250°40′ for a distance of 2,200 feet to the intake crib. There is about 15 feet of water over the crib.

Charts 14862, 14865.—From Goderich 30 miles southerly past Bayfield to Grand Bend, and thence 14 miles southwesterly to the vicinity of Kettle Point, the coast is of a uniform character, with deep water approaching to within 1 mile of the shore. Cantin Shoal, with least depth of 8 feet, lies about 1 mile from shore at a point 3½ miles north of Grand Bend. There is holding ground along this stretch in depths of 4 to 6 fathoms, the bottom being generally sand, with some areas of clay and boulders. The bight east of Kettle Point offers protection in winds from southwest through south to east.

Bayfield is at the mouth of **Bayfield River,** about 12 miles south of Goderich. The harbor is formed by two piers. The south pier is 824 feet long, its outer end being opposite the shoreline adjoining the north pier. The north pier, 755 feet long, extends about 115 feet beyond the north shoreline, from which point a steel sheet pile structure extends 100 feet southwesterly. Dredging to a 7-foot grade was carried out in September 1964 in the entrance channel and harbor basin. A training wall 500 feet long inside the harbor on the north side and a steel sheet pile wall 700 feet long on the south side are available for the accommodation of small boats. The entrance channel is marked by a 076¾° lighted range and by a light on the south breakwater. A fog signal is at the south breakwater light.

Grand Bend is situated on the north arm of the Au Sable River about ½ mile from the mouth in Lake Huron and about 30 miles south of Goderich. There is a steel sheet pile and concrete pier on the north side of the river

mouth, 372 feet long and 26 feet wide; also a revetment wall extending 560 feet inward from the pier, a protection work 361 feet long on the south side of the entrance, and a 300-foot-long steel sheet pile wall with a 70-foot-long return wall also on the south side. These structures provide an open channel 90 feet wide at the entrance to the river and afford a harbor of refuge to fishing boats and recreational craft. Dredging to a 7 foot grade depth was carried out in 1974, but very rapid siltation occurs in the area of the end of the south pier. Navigators should exercise extreme caution when approaching the harbor. A light is located on the outer end of the pier, forming a range with a light located on a steel tower 519 feet 098° from the pier light. An air whistle has been established on the rear light tower.

Port Franks is situated on the west arm of the Au Sable River about one mile upstream from the mouth in Lake Huron and about 9 miles southwest of Grand Bend. A light is shown from a pole located on the beach on the south side of the entrance from the lake.

Kettle Point to St. Clair River.—At Kettle Point a dangerous ledge extends out all around the point between the bearings north to southwest, with generally less than 18 feet depth within a radius of 2 miles, spots of 11 feet at 1½ miles out, and very scant water within 1 mile. Kettle Point Reef lighted buoy, located about 2 miles northwesterly from Kettle Point, marks the outer limit of 18-foot depth, and a buoy marks the west side of the reef. Kettle Point is marked by a light. Outlying shoals continue southwest along the shore with an extent of 2 miles to the vicinity of Blue (Harris) Point, which is 11 miles southwest of Kettle Point. Shoal water exists for 2 miles off along the shore for 5 miles southwest of **Blue (Harris) Point.** Thence for 7 miles southwesterly, or to a point 2¾ miles from the head of St. Clair River, the shoal border has an average width of ⅜ mile. Between Blue (Harris) Point and the shoals in the south end of Lake Huron, there is holding ground in depths of 24 to 30 feet, bottom gravel and sand.

Perch Creek is about 8 miles east of Point Edward. The entrance channel has a 400-foot long steel sheet pile training wall on both sides extending 200 feet from shore. The entrance channel has a width of 60 feet, and was dredged in 1970 to a depth of 5 feet.

Description of the shoal area filling the south end of the lake and of the improved channel to the head of St. Clair River is given at the beginning of the Lake Huron description.

11. LAKE MICHIGAN

Depths and vertical clearances under aerial crossings, and bridges herein given are referred to Low Water Datum, which for Lake Michigan is an elevation 576.8 feet above mean water level at Pointe-au-Pere (Father Point), Quebec, on International Great Lakes Datum (1955).

DIMENSIONS, ETC.

Length, steamer track, Chicago to Straits of Mackinac ..... miles	321
Length (right line), from about longitude 87°30′, south end, to 85°45′, north end ..... miles	307
Breadth (right line), on about 45°25′, north latitude ..... miles	118
Depth, maximum recorded by NOS ..... feet	923

Areas in square miles:

Water surface of lake*	22,300
Entire drainage basin*	67,900

*Including Green Bay.

GENERAL DESCRIPTION

Fluctuations of Water Level.—The average or normal elevation of the lake surface varies irregularly from year to year. During the course of each year, the surface is subject to a consistent seasonal rise and fall, the lowest stages prevailing during the winter months and the highest during the summer months.

In addition to the annual fluctuation, there are also oscillations of irregular amount and duration produced by storms. Some, with periods of a few minutes to a few hours, are the result of squall conditions, the fluctuations being produced by a combination of wind and barometric pressure changes that accompany the squalls. At other times the lake level is affected for somewhat longer periods, such as many hours or a day, by strong winds of sustained speed and direction which drive the surface water forward in greater volume than that carried by the lower return currents, thus raising the elevation on the lee shore and lowering it on the weather shore. This result is materially augmented in bays and at extremities of the lake, where the impelled water is concentrated in a restricted space by the converging shores, especially if coupled with a gradually sloping inshore bottom which reduces the depth and checks the reverse flow via lower currents. This latter condition is very pronounced at Green Bay Harbor.

Anchoring of Vessels.—Cautionary Notice.—When coming to anchor vessels masters are cautioned not to foul submarine cables. Fouling cables may not only result in disrupting utility services to adjacent communities but also expose the mariner to the danger of high voltages carried by certain cables. Mariners are advised to slip the anchor rather than cut the cable if the normal practice of good seamanship fails to clear the fouled anchor. Lost gear or damaged cables should be reported to the authority having jurisdiction over the waterway.

Weather Conditions.—The long axis of the lake, north and south, aggravates the effects of northerly and southerly strong winds and gales, affording an extended fetch for the propagation of dangerous seas, and creating strong currents and hazardous conditions at the harbor entrances. It is of importance to note that the stronger winds of the fall, winter, and early spring are usually from westerly quadrants, making entrance to the restricted harbor channels of the east shore especially difficult, and sometimes increasing dangers by the formation of storm bars. In the spring, navigation in the northerly part of the lake is rendered perilous by fog and by shifting ice fields, particularly in the region of the Straits of Mackinac.

The highest wind velocity, as derived from long-time records of the National Weather Service for certain shore stations, is 95 knots (109 miles per hour) from the southwest at Green Bay, Wis., in May 1950; the shore-station values are subject to the condition that the free flow of the wind is diminished by land friction. The highest velocity as observed on anemometer-equipped vessels while more than 6 miles offshore was 58 knots (67 miles per hour), in November 1955; but such records began in 1941 and self-recording data over a long period, which would register higher winds, are not available.

East Shore—Natural Conditions and Scope of Improvements.—The east shore of the lake is generally composed of fine sand, large quantities of which are set in motion by severe on-shore winds and storms. Such harbors as existed before improvement by the United States were in the mouths of creeks or small rivers, or at the outlets of

small lakes near the lake shore, and were either in their natural condition or partially improved by local enterprise.

The United States began works of improvement with the chief object of removing bars at harbor entrances. The invariable plan was to confine the current between parallel piers, suitably directed and a moderate distance apart, varying with the size of the stream and the needs of the harbor. In every case the channel was greatly improved by the Government operations, the bar being washed into deeper water. This was followed by pier extensions and dredging, effecting the present channel depths which are from 6 to 27 feet, varying somewhat in proportion to the importance of navigation at the various ports. The natural processes which formed the original bars are still in operation, however, and further extension of piers can in most instances afford but temporary relief at disproportionate cost. Dredging is the only remedy adequate to maintain existing depths and to prevent further radical advance of the shore lines, and is proving effective.

In recent years, the injurious effects of storm waves in inner harbors have been relieved by the formation in the lake of a wave-stilling basin, inclosed by breakwaters or piers which converge to an entrance opening in deep water beyond the inner piers, this basin allowing the waves to expand and lose force instead of being conducted through the confined channel between the parallel piers. Such basins now exist on this shore at Holland, Muskegon, Ludington, Manistee, Frankfort, and Leland.

Harbor Springs, on the north shore of Little Traverse Bay, while limited in area, is one of the finest natural harbors of refuge on the lakes, affording security in any weather. Petoskey Harbor, on the south shore of Little Traverse Bay, is formed by a detached breakwater which shelters the wharf from westerly winds, but is of little use in heavy weather.

West and South Shores—Natural Conditions and Scope of Improvements.—The harbors along these shores are generally located at the mouths of rivers. Most of these rivers are small and unimportant, the only large streams being the Fox and the Menominee, both of which empty into Green Bay, the largest bay on the lake.

The early plan of improvement consisted of parallel piers protecting a dredged channel; subsequently, at some harbors, detached breakwaters were built to provide additional protection from prevailing storms. The form of entrance protection to counteract the injurious effects of wave action in inner harbors, as mentioned in the description of the east shore above, has been adopted on the west shore at Waukegan, Racine, Kenosha, Port Washington, Sheboygan, Manitowoc, Two Rivers, Kewaunee, Algoma and Manistique. The outer harbors at South Chicago (Calumet) and Milwaukee, protected by breakwaters, afford commodious and safe anchorage for all classes of vessels. The harbors of Burns Waterway, Gary, Buffington Harbor, Indiana Harbor, Great Lakes, Waukegan, Port Washington and Port Inland are entirely artificial, consisting of dredged channels and basins protected by breakwaters, piers, and revetments. Sturgeon Bay, an estuary of Green Bay, is connected with Lake Michigan by a canal excavated across the narrow divide between the two, affording more direct communication between the lake and the south end of Green Bay. Escanaba, on Little Bay de Noc in the north end of Green Bay, is a good natural harbor at which no Government work has been required. As a result of the improvements made and maintained by the United States and local interests, the harbors on the west shore of the lake are generally accessible to vessels drawing from 8 to 28 feet, and on the south shore up to 27 feet.

The Winter Navigation of Lake Michigan consists of regular car-ferry lines between Muskegon and Milwaukee; between Ludington and Kewaunee, Manitowoc, and Milwaukee; and between Frankfort and Kewaunee. In addition, tankers ply between Indiana Harbor and Racine, Milwaukee, Sheboygan, Two Rivers, Kewaunee, St. Joseph, Grand Haven and Muskegon. Barge traffic also operates year round between Indiana Harbor, Gary and Chicago.

Separate Steamer Lanes for Vessels.—The Lake Carriers' Association and the Dominion Marine Association have prescribed, for vessels enrolled in the associations, the following separation of routes for up-bound and down-bound traffic in Lake Michigan:

Southbound vessels, bound for Milwaukee and west shore points north thereof, shall run out 30 miles from point of departure abreast of Lansing Shoal on course to Rock Island Passage, thence to destination.

Southbound vessels, bound for west shore points south of Milwaukee, shall run out 30 miles from point of departure abreast of Lansing Shoal on course to Rock Island Passage, then head on Milwaukee breakwater to a point 19 miles 114¾° from Rawley Point Light, thence to destination; except that, vessels bound for points south of Chicago shall, from the prescribed point off Rawley Point Light, lay a course to Chicago Harbor Outer Lighted Bell Buoy 1 and thence to destination.

Southbound vessels from Sturgeon Bay and points north thereof, as far as Port Inland, bound for ports near the south end of Lake Michigan, shall lay their course to a point 19 miles 114¾° from Rawley Point Light, joining the main southbound lane, thence to destination.

Southbound vessels from the Straits of Mackinac bound for east shore points north of Point Betsie shall use the Grays Reef Passage.

Southbound vessels from the Straits of Mackinac bound for east shore points south of Point Betsie shall use the Northabout course by Lansing Shoal.

Northbound vessels for Straits of Mackinac will navigate via Manitou Passage. This rule does not apply to vessels coming out of Green Bay.

Vessels downbound out of St. Martin and Rock Island Passages shall set a course to pass not more than 6 miles off Seul Choix Point.

Vessels bound from ports near the south end of Lake Michigan to Escanaba shall keep not more than 8 miles off Wind Point and not more than 5 miles off Rawley Point Light.

Northbound vessels to Port Inland from near the south end of Lake Michigan shall follow the northbound Mani-

tou course to a point about 5¾ miles off Point Betsie, thence to about 4 miles off Boulder Reef, and thence to destination.

It is understood that masters may exercise discretion in departing from these courses when ice and weather conditions are such as to warrant it.

The recommended courses are designated on the general chart No. 14900, Lake Michigan.

DETAILED DESCRIPTIONS OF COAST LINE, HARBORS, ISLANDS AND REEFS

Section I.—Straits of Mackinac, South Shore From Old Mackinac Point, Mich., to Grand Traverse Light, Mich., Including Grand and Little Traverse Bays.

Charts 14880, 14881, 14902.—Old Mackinac Point, Mich., the most northerly point of the Lower Peninsula of the State of Michigan, is marked by Old Mackinac Point Tower and may be used as the turning point from Lake Huron to Lake Michigan through the Straits. Due south of the Point Tower is Mackinaw City.

Mackinaw City, Mich.—A village and railroad terminus located on Old Mackinac Point. Railway car ferries operate across the Straits of Mackinac to St. Ignace throughout the year. St. Ignace is a community on the east side of Point St. Ignace which is the southern most part of the Upper Peninsula lying due north of Mackinaw City about 4 miles. (See also under Lake Huron.)

Channels.—A breakwater extending northward from the end of the railroad pier and a combination breakwater and dock extending from shore on the north side of the railroad pier enclose the harbor basin which is entered from northward. In 1976, the controlling depth was 10 feet in the entrance channel.

The railroad pier is located on the east side of the point about ⅝ mile from the lighthouse and is protected from winds from northwest through west to southwest; private lights are shown on the pier. The State of Michigan has a landing dock located about a block south of the railroad pier and extending about 1,400 feet from shore to a natural depth of about 17 feet. A maneuvering area has been dredged off the end of the dock and affords depths of 19 and 20 feet, except for shoal areas with a least depth of 16 feet.

The old city dock, about 1,200 feet north of the railroad pier, is in ruins and submerged. Two or three of the outer cribs about 600 feet offshore are within 3 or 4 feet of the lake surface and should be avoided.

Ruins of another dock about 200 feet south of the railroad pier, extend about 600 feet offshore with less than 1 foot of water over some portions.

Aids to Navigation.—An air diaphragm foghorn is maintained by the Mackinac Transportation Co. on the end of the railroad pier at the Mackinaw City Light. The horn is directed northeasterly and operates during foggy weather throughout the year.

Harbor Facilities.—The village and the Michigan State Waterways Commission have jointly constructed public docking and launching facilities in the basin north of the railroad pier. Water, electricity, lights, restrooms, showers, gasoline and oil, sewage pump-out facilities, a boat ramp maintained by the village in the northwest corner of the basin, and harbor attendant services are available. A 20-ton hoist and marine repair services are offered in the harbor by private enterprise. Restaurants and stores are nearby.

Straits of Mackinac Bridge.—The bridge, opened in November 1957, extends across the straits from Mackinaw City to St. Ignace, Mich., and is composed of three high-level suspension spans and two series of fixed spans which are connected to the south shore in Mackinaw City and a causeway on the north shore that forms a part of the northern approach to the Straits of Mackinac Bridge. Constructed by the State of Michigan in a southerly direction from the south side of Graham Point about 1 mile west of its extremity, the causeway extends about 4,000 feet from shore to the 12-foot contour. The center suspension span of the bridge is 3,800 feet wide with a vertical clearance of 148 feet at center decreasing to 135 feet at each end. The north and south suspension spans are each 1,800 feet in width having maximum vertical clearances of 131 feet decreasing to 86 feet at the shore ends. Between each of these spans and the adjacent cable anchor pier, there is a fixed span having an opening of 472 feet with a decreasing vertical clearance of 86 feet to 50 feet at the anchors. The south approach is composed of 16 fixed spans with openings between piers varying in width from 560 feet to 160 feet and having varying vertical clearances of 81 feet to 20 feet. The north approach is composed of 12 fixed spans and a causeway approximately 3,780 feet projecting from shore. The openings between piers of the north approach vary in width from 393 feet to 160 feet and have varying vertical clearances of 79 feet to 20 feet.

The lake approaches to the center span of the bridge are marked with buoys. A diaphragm horn is located under the main span on the channel line. The fog signal on the bridge is a private aid to navigation maintained by the Mackinac Bridge Authority.

From Old Mackinac Point to Waugoshance Point the shoal area is about 1¼ miles wide, diminishing to ½ mile in extent from shore in Cecil Bay and Big Stone Bay to the westward.

Between Old Mackinac Point and McGulpin Point about 2 miles westward, the shore recedes somewhat, forming a small bight which is generally shallow to ⅝ mile out.

Submerged Cables.—Three submerged cables cross the Straits of Mackinac from McGulpin Point on the south shore to Point LaBarbe on the north shore.

Submerged Pipelines.—Two 24-inch high pressure, nat-

ural gas pipelines of the Great Lakes Gas Transmission Co., lie exposed on the floor of the Straits of Mackinac below the 50-foot water depth contour, approximately 1,000 feet apart and one mile west of the Mackinac bridge.

Two 20-inch submarine pipelines, carrying petroleum products across the Straits of Mackinac from McGulpin Point on the south shore to Point LaBarbe on the north shore, are located 1,300 feet apart on the natural lake bottom at midpoint, and are buried 15 feet below the existing lake bottom shoreward of the 65-foot depth contour.

To the northwest between McGulpin Point and Cecil Bay, the bay opening is generally shallow, with depths of 15 feet about 1½ miles out; it affords protection from all winds except from north to west. There is deep water close-to around McGulpin Point, facing northwest.

From the east point of Cecil Bay a shallow spit extends ½ mile northwesterly, and a detached shoal spot with 19-foot depth lies in deep water about 7,500 feet northerly of this point.

Westward from Cecil Bay and Big Stone Bay, where the shoal water extends about ½ mile from shore, the shoal area increases to about 1¼ miles wide to abreast of the shore on the north side and at the inner end of Waugoshance Point.

Charts 14880, 14902, 14911.—Waugoshance Point is a very narrow strip of land which extends westward a distance of 2 miles, and is further prolonged by numerous small islands and very shallow water reaching to **Waugoshance Island,** which is 2 miles west of the extremity of the point. Waugoshance Island is about 1 mile in length east and west and ⅓ mile in breadth. Waugoshance Point and off-lying islands are outcropping ridges of an extensive bank which reaches 6¼ miles northwest from the shore at the inner end of the point, with depths of only 5 to 8 feet at the outer end. Waugoshance Lighthouse Tower, displaying only a day-beacon, is on the end of this shoal bank and to the southeastward of the turning point from the Straits of Mackinac into Lake Michigan through the passage known as Grays Reef Passage, between Beaver Island and the mainland. Protective rip-rap extends horizontally out from the tower base about 25 feet. In the deeper water to northward and westward off the outer end of the Waugoshance bank are many detached shoals and spots, which are specially described under Section II, below.

Waugoshance Point to Seven Mile Point, Mich., includes Sturgeon Bay as the coast curves from the north into the east and south to Sturgeon Bay Point and on past Cross Village and past Good Hart to Seven Mile Point.

Sturgeon Bay is a broad bay on the northwestern side of the Lower Peninsula of Michigan and is open to the westward; from its southwest point a shoal with but 3 to 6 feet of water over it extends northwestward ½ mile. The northerly portion of the bay is completely filled by an extensive area of shallow water over rock, which reaches 2¼ miles westward from the shore at the head of the bay and 1¾ miles southward from Waugoshance Point and the outlying islands west of the point.

Cross Village, Mich., is about 8 miles south of Waugoshance Point and 2 miles south of Sturgeon Bay Point. In June 1978, the former small-craft basin had partially filled with sand and gravel, and the breakwater was in ruins. No shelter is available at Cross Village.

Charts 14880, 14902, 14913.—Seven Mile Point to Big Rock Point, Mich., is the section known as **Little Traverse Bay.** It is generally deep water to within ½ mile of the shore. Harbor Springs is on the north shore and Petoskey is on the south shore. Little Traverse Bay is about 11½ miles long, narrowing from 10 miles width at its entrance between Seven Mile Point and Big Rock Point, to 2 miles at the head of the bay. It has deep water and good holding ground, and affords protection from all but westerly winds.

There is a shoal ½ mile in extent in the northeast corner of the head of the bay, and with this exception the coast is deep-to from the head of the bay to Little Traverse Light, on the extremity of Harbor Point which extends 1 mile into the bay at Harbor Springs. This light, which is on a white skeleton tower, is a guide into Little Traverse Bay.

NOTE.—About 2½ miles further east of the east end of Little Traverse Bay or 6 miles northeast of Petoskey is the western end of the navigable channel in the Inland Route at Conway, Mich. The Inland Route is a series of connecting waters, comprising Mullet Lake, Indian River, Burt Lake, Crooked River, and Crooked Lake, in all, about 36 miles in length, and extending from Cheboygan on Lake Huron westerly across the northern part of the Lower Peninsula to Conway, Mich. There is no navigable water for any type of small craft between Conway and Little Traverse Bay, however there is overland portage available for trailerable craft up to 25 feet and 5,000 pounds (see entry under Oden, Mich. for details).

Harbor Springs, on the north shore of Little Traverse Bay, is a fine small-craft harbor of refuge affording security in any weather. On the north shore of the bay, docks extend to 10 to 12 feet of water, with 16 feet at the end of the municipal marina dock.

Aids to Navigation.—State Street Pierhead Light is 18 feet above the water on the southerly end of the dock easterly of State Street extended. Spring Street Pierhead Light is on the southerly end of the dock in extension of Spring Street.

Marine Services.—A municipal marina constructed by the Michigan State Waterways Commission and City is available and provides water, electricity, lights, restrooms, showers, sewage pump-out facilities, and harbor attendant services. Also available in the harbor are marine repairs, hoists up to 50 tons, and marine railways for craft up to 75 feet.

Local Harbor Regulations are established by the Harbor Springs City Council and are enforced by the harbormaster. A slow—no wake speed is enforced within the

limits of the harbor. Copies of the regulations may be obtained from the Harbormaster, City of Harbor Springs, 349 East Main Street, Harbor Springs, Michigan 49740.

Petoskey Harbor, Mich., is on the south shore of Little Traverse Bay, near its inner end.

The harbor is protected from the west by a breakwater extending northward from the shore. Navigation close to the breakwater should not be attempted due to large riprap stones along the sides and end. Mooring vessels to the breakwater is prohibited.

The depth of water near the outer end of the breakwater is about 23 feet, decreasing gradually to about 9 feet at the end of the municipal wharf, 8 feet in the outer 500 feet of the anchorage area, and 6 feet in the inner 250 feet of the anchorage area. The anchorage ground is bad, being stony, and the only mooring facilities are at the municipal wharf on the east side of the harbor.

Aids to Navigation.—Petoskey Light is located on a skeleton tower near the outer end of the breakwater.

Harbor Facilities.—The city of Petoskey and Michigan State Waterways Commission have constructed docking and launching facilities adjacent to the municipal causeway. Water, electricity, lights, gasoline and oil, restrooms, showers, sewage pump-out facilities and harbor attendant services are available.

Radio Facility.—Station KVR 410—A radiotelephone operating on channels 16, 9 and 68 is available at the marina in Petoskey.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

The Cement Division Plant of Penn-Dixie Industries is on the south shore of Little Traverse Bay about 2¾ miles west of Petoskey Light. Mooring cells provide 400 feet of berthing space with a deck height of 10 feet and a depth of 29 feet alongside reported in June 1978. A coal wharf just east of the cement shipping facility offers 350 feet of berthing, deck height of 10 feet, and depth of 22 feet reported alongside in June 1978. Storage silos provide an excellent landmark.

The Big Rock Nuclear Power Plant is located on Big Rock Point. A large green domed building and stack provide excellent landmarks. Lights mark the top of the stack.

Discharge Canal.—A water discharge canal has been dredged from a point on the shore about 1,500 feet 039° from the stack at Big Rock Point Power Plant and extends about 200 feet 022° into the lake. This canal also continues on a straight line into the shore to a pump house.

Water Intake Pipeline.—A 72 inch water intake pipeline of the Consumers Power Company commences at a point on the shore line approximately 600 feet 038° from the stack at Big Rock Point Power Plant and extends 1,400 feet 348° to an intake crib in about 38 feet of water. There is a depth of 26 feet over the crib and it is not marked.

Charts 14902, 14913.—South of Big Rock Point and around the coast to Grand Traverse Light are many deep-water bays and protected areas, including Charlevoix Harbor and Grand Traverse Bay. Several shoal areas of less than 15 feet, with deep-water surrounding, are scattered through this area.

Charts 14913, 14942.—**Charlevoix Harbor, Mich.** is at the mouth of **Pine River** about midway of the rounding shore between Little and Grand Traverse Bays.

Channels.—A dredged entrance channel leads southeastward from Lake Michigan between parallel piers through the lower portion of Pine River to **Round Lake,** the harbor proper of Charlevoix. From the east end of Round Lake, a dredged channel leads southeastward through the upper portion of Pine River to **Lake Charlevoix,** entered about 1 mile distant from the Lake Michigan shoreline.

In August 1978, the controlling depths were 18 feet from deep water in the lake through the approach channel, thence 18 feet through the channel between the piers to Round Lake except for shoaling to 16 feet along the north and south limits, thence 18 feet from Round Lake to Lake Charlevoix except for shoaling to 16 feet along the south limit.

Currents in Pine River are reported to reverse twice daily with a velocity up to 3 m.p.h. At times they may reach a velocity up to 5 m.p.h.

The inner harbor affords mooring facilities at private and municipal wharves. Mooring to the Government piers or revetments is prohibited.

Round Lake, about ⅜ mile in diameter, has a depth of over 60 feet, with deep water generally close to shore. The channel course through it bears about southeasterly. The anchorage is good; wharves are found along the west and south sides. The City, and the Michigan Waterways Commission have reconstructed the municipal marina located on the west shore of Round Lake. There are transient accommodations for in excess of 40 craft, with water, electricity, sewage pump-out facilities, rest rooms, showers, lights, and harbormaster services available.

Lake Charlevoix is about 14 miles long and from 1 to 2 miles wide, with depths of over 122 feet and deep water generally close to shore. **Boyne City** is at the southeasterly head of the lake, and the City and the Michigan State Waterways Commission have provided a public docking facility which offers mooring, water, electricity, sewage pump-out facilities and lights. At **Advance,** about 2½ miles west of Boyne City, the Northern Michigan Electric Cooperative, Inc. has a coal dock providing about 500 feet of berthing space between dolphins. The dock has a deck height of 8 feet with a depth of 20 feet reported alongside in June 1978. About 5 miles from the northwesterly end of the lake **South Arm** extends southerly 9 miles from **Ironton** at the north to **East Jordan** to the south.

Structures Across Pine River From Mouth to Lake Charlevoix

No.	Location and name	Kind	Miles above mouth of river	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Submerged cable	CATV	0. 20						Community Antenna Television System. Approximate depth 31 feet.
2	Submerged pipeline	Gas	0. 25						Approximate depth 31 feet.
4	Outfall	Sewer	0. 30						24-inch diameter. Invert Elev. 0.4 below IGLD.
6	Bridge St. bridge	Highway	0. 34			90. 0	16. 8		Bascule*—See note 1.
8	Submerged pipeline	Water	0. 35						12-inch diameter. Approximate depth 27 feet.
9	Submerged cable	Electric	0. 35						Approximate depth 27 feet.
10	Submerged pipeline	Gas	0. 36						6-inch diameter. Approximate depth 25.7 feet.
11	Submerged pipeline	Sewer	0. 37						8-inch diameter. Approximate depth 25 feet.
12	Submerged pipeline	do	0. 37						10-inch diameter. Approximate depth 25 feet.
13	Outfall	do	0. 38						18-inch diameter. Invert elevation 3 feet below IGLD.
14	Submerged cable	Electric	1. 07						Approximate depth 27 feet.
15	Submerged pipeline	Water	1. 07						8-inch diameter. Approximate depth 27 feet.
16	Submerged cable		1. 07						Approximate depth 27 feet.
17	Submerged cable	Electric	1. 08						Approximate depth 19 feet.
18	Chesapeake & Ohio bridge.	Railroad	1. 10	†84. 0			10. 3		Swing*—See note 2.
19	Submerged cable	Electric	1. 13						Approximate depth 25 feet.

† Left opening not accessible.

*See Bridge Regulations under 33 C.F.R. § 117.690.

Whistle Signals for Opening Draws: 1 long, 1 short (— —).

NOTE 1. This bridge is across the lower channel and has a red light on each end of each roller pier; also a light on each side of free end of each leaf showing red when bridge is closed and green when open.

NOTE 2. This bridge is across the upper channel and has a red light at each end of south abutment and at each end and center of draw rest; also 3 compound red-and green lights on top of draw span (at center and each end), showing red up and down stream when bridge is closed and green when open.

Cable Ferry.—A cable ferry crosses South Arm at Ironton. The self-propelled ferry is guided across the 600-foot-wide channel by two cables which are anchored ashore and pass along each side of the ferry at deck level. The cables are at a depth of about 20 feet at midchannel when the ferry is docked on either shore. When the ferry is at midchannel, the cables are at their least depths. The ferry should not be passed within about 200 feet when docked at either shore. **DO NOT ATTEMPT TO PASS A MOVING CABLE FERRY.**

Aids to Navigation.—Charlevoix South Pierhead Light is located near the outer end of the south pier; a fog horn is located at the light. North Pierhead Light is on the north pier near its outer ends.

The municipal water tower at Charlevoix is illuminated at night by white lights maintained by the city of Charlevoix. The tank is located on high ground on the south bank of the entrance channel from Lake Michigan into Round Lake and is an excellent landmark. Vessels approaching the harbor at night on courses between 075° and 103° should exercise due caution to avoid shoal water off South Point.

A **special anchorage area** is in the northern and northeastern quadrants of Round Lake. The limits are marked by buoys. Sand and gravel bottom provides good holding ground.

Ferry.—Ferry service is available between Charlevoix Harbor and St. James Harbor, Beaver Island, Mich. from April to December. Reservations are required for autos, but not for passengers or freight. The ferry terminal is on the western shore of Round Lake about 300 feet southeast of the U.S. Highway 31 bridge.

Coast Guard Station.—Charlevoix Coast Guard Station is located on the north side of the Pine River entrance to Lake Charlevoix just west of the railroad bridge.

Marine Services.—Practically all types of service are available including marine repairs and 20-ton hoists for small craft. Gasoline and diesel fuel are available at dockside pumps.

Anchorage Regulations.—See 33 CFR § 110.1 and § 110.82 of Rules and Regulations, preceding.

Bridge Regulations.—See 33 CFR § 117.690 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

Local Harbor Regulations.—Harbor regulations have been established by the city of Charlevoix, and are enforced by the harbormaster. A slow—no wake speed is enforced. Copies of regulations may be obtained from the Chief of Police, City Hall, 210 State Street, Charlevoix, Michigan 49720.

West from Charlevoix the coast is clear outside ¼ mile to South Point marked at the outer end with a bell buoy located 9,300 feet 283½° from the Charlevoix South Pierhead Light.

Outfall Pipeline.—A 24″ steel outfall pipeline of the city of Charlevoix commences at the shoreline about 4,900 feet 247° from Charlevoix South Pierhead Light and extends about 1,600 feet 337° to an outlet in about 27 feet of water. There is a clear depth of 26 feet over the outlet and it is not marked.

Port Medusa, Mich.—The Medusa Cement Co. has constructed cement shipping and coal-receiving facilities along the east side of South Point and about 1¼ miles westerly of Charlevoix Harbor. A breakwater formed by two sunken barges extends about 1,600 feet lakeward from the shore and affords protection for ships using the loading slip and for the dredged channel lying parallel to and just south of the structure. The slip is about 100 feet wide and has a depth of 23 feet reported in June 1978. The north side is 645 feet long and is used to ship cement. The south side is 556 feet long and is used to receive coal for plant consumption.

Aids to Navigation.—A light, 6,520 feet 266° from Charlevoix North Pierhead Light, marks the outer end of the breakwater. Loading silos and a lighted stack are excellent landmarks.

West of South Point, the shore tends to the southwest about 4 miles to **Fisherman Island**, at the northeasterly entrance to Grand Traverse Bay. This island, about ⅜ mile offshore, is a small island situated on a rocky bank reaching over 1 mile northwesterly from the mainland, with only 6 to 9 feet of water on its outer edge; a can buoy marks the northwesterly end of the shoal, about 3¾ miles southwest from the end of South Point at Charlevoix.

Chart 14913.—Grand Traverse Bay, Mich., extends southerly from Lake Michigan about 32 miles, is about 10 miles wide, and is separated from the lake to the west by the Leelanau Peninsula. Its head is divided into the East and West Arms by a narrow peninsula extending northerly about 17 miles and terminating in Old Mission Point. The shores of the bay are generally hilly and wooded.

The east shore of Grand Traverse Bay from Fisherman Island to the south end of the East Arm is rendered unsafe to approach within 1 mile by many rocky spots and ledges and numerous spits extending from the shore. A boulder shoal about ½ mile long north and south and ¼ mile wide within the 21-foot contour, with least depth of 15 feet, lies about 4 miles northwesterly of Eastport at the north end of Torch Lake; a buoy marks the northwesterly end of the shoal.

Elk Rapids, Mich.—The village of Elk Rapids is situated on the east shore about 12 miles from the head of the East Arm. The Village of Elk Rapids and Michigan State Waterways Commission have completed a breakwater, groin, and public dock adjacent to the Village which is serviced by an entrance channel dredged to a depth 5.5 feet. The dock provides water, electricity, lights, sewage pump-out facilities, gasoline, restrooms and showers. A launching ramp is also available. Deepening the entrance channel and mooring basin to a depth of 8 feet and constructing a breakwater on the westerly side of the channel were completed in 1969.

Aids to Navigation.—The channel is marked by lights on the breakwaters, a leading light on the point inside the breakwaters, and seasonal buoys; all are private aids.

At **Deepwater Point,** on the east shore about 3 miles from the head of the East Arm and about 1 mile north of the town of **Acme,** there are piles (but no dock) to which vessels formerly tied up to deliver coal by use of their self-unloaders. At **Cuttysark Harbor,** about 1⅜ miles south of Deepwater Point, is a marina with limited transient berthage, gasoline, diesel fuel, water, electricity, and pump-out station. The head of the East Arm at the south end of the Bay is filled by a shallow flat reaching 1¼ miles from shore.

Elk Lake, Lake Skegemog (Round Lake), Torch Lake, Clam Lake, Bellaire Lake, and connecting waters are an intercommunicating group lying adjacent and generally parallel to the east shore of the East Arm of Grand Traverse Bay, and are held to be navigable waters of the United States. However, the Corps of Engineers does not exercise jurisdiction over these waters. There are no navigable outlets from any one of these lakes into Grand Traverse Bay.

Elk Lake, at the south end of the group, is about 9 miles long and from 1 to 1½ miles wide. At about 3 miles from its north end, a narrow arm in the west shore extends nearly to the shore of Grand Traverse Bay, terminating in a short stream which forms the outlet, where the town of Elk Rapids is situated. There is a fall of about 11 feet from the lake to the bay and this head is utilized for power development. The stream below the powerhouse is not suitable for navigation and personal portage is necessary to transfer vessels between the lake and bay.

Lake Skegemog (Round Lake), opening from the southeasterly side of Elk Lake, is about 3½ miles long and 1¼ miles wide. From it the Torch River extends about 2 miles north to Torch Lake, which has a length of about 18 miles north and south, with width of from 1 to 2 miles; the town of Alden being situated on the east shore near the southerly end and the town of Torch Lake on the west shore at the northerly end. From the east side of Torch Lake at Clam River (Helena), about 6 miles from its south end, there is passage easterly through Clam Lake, about 4 miles long and ¼ mile wide, and thence north into Bellaire Lake, which is about 4 miles long and from ¼ to 1½ miles wide. From the easterly side of Bellaire Lake, a channel extends north about 2½ miles to Intermediate Lake; but at the town of Bellaire, on this channel about 1½ miles from Bellaire Lake, there is a dam across the stream barring passage through to Intermediate Lake.

This lake system is presently used by small craft but previously was navigated by larger powerboats and by a few steam and gasoline vessels measuring up to about 22 gross tons.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The city of Traverse City has an unmarked water intake located on the west side of the East Arm. The 36 inch intake commences from a point on shore 9,250 feet 017° from the Aero Beacon at the Municipal Airport and extends 4,200 feet 079° to a crib with 31 feet over.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 5, Antrim county. R 281.705.1. Rivers and channels.

1. On the following rivers and channels, county of Antrim, state of Michigan, no operator of any motorboat shall exceed a "slow—no wake" speed:

(a) Clam river from Torch lake to Clam lake.
(b) Grass river from Clam lake to lake Bellaire.
(c) Intermediate river from lake Bellaire to Intermediate lake.
(d) Channel connecting Intermediate lake to Hanley lake.
(e) Channel connecting Hanley lake to Benway lake.
(f) Channel connecting Benway lake to Wilson lake.
(g) Channel connecting Wilson lake to Ellsworth lake.
(h) Channel connecting Ellsworth lake to St. Clair lake.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 5, Antrim and Kalkasa county.

R 281705.2 and R 281.740.8. Torch river and Torch lake adjacent to its mouth; slow—no wake speed.

2 and 8. On the waters of the Torch river, sections 6, 7, and 18, town 28 north, range 8 west, from the south line of section 18, town 28 north, range west, to the north end of the river and for a distance of 300 feet in any direction in Torch lake, * * *

The west shore of the East Arm has shoals out to ½ mile for a distance of about 2¼ miles and from there to Old Mission Harbor. The shore may be approached within ¼ mile. **Old Mission Harbor affords good shelter** from all winds from east through north to southwest; its northeasterly shore is deep-to, and shallow water extends from 1,000 to 1,500 feet off the opposite shore. A shoal extends about ⅜ mile off the point on the north side of Old Mission Harbor. From there northward to **Old Mission Point,** marked by an old lighthouse, the shoal extends only ¼ mile offshore. Generally, the offshore area within 1½ miles to the north and west of Old Mission Point has shoals of less then 12 feet near the outer edge and should not be traveled even by small craft.

Mission Point Light, located on a detached shoal about 1⅞ miles northwest from the northeast end of Old Mission Point, is a guide into the East and West Arms of Grand Traverse Bay. A small rock shoal with 22 feet depth lies 1⅝ miles northeasterly from the light and is not marked.

To the southwest of Old Mission Point, the east shore of the West Arm carries to Merril Point and down to **Tucker Point** forming the west side of Bowers Harbor.

Between Merril Point and Tucker Point the offshore bank makes it unsafe to approach within ⅝ mile of the shore. A shoal with only 3 feet over it extends ½ mile southerly from Tucker Point; its outer limit is marked

by a black buoy. **Bowers Harbor,** enclosed by Tucker Point, is sheltered from all but southwesterly winds with secure anchorage. A marina at Bowers Harbor provides limited transient berthage, gasoline, water, electricity, launching ramp, and limited hull and engine repairs to trailerable craft. **Marion Island,** about 1 mile long and half as wide, lies off the mouth of Bowers Harbor about 1¼ miles southwest of Tucker Point; shallow spits extend nearly ¾ mile from its southwesterly end, with a buoy at the outer edge, and nearly ½ mile from its northeasterly end, where a buoy marks the shoal limit.

Wreck.—In March 1974, a 62-foot wood hull tug was sunk 400 feet northeast of Marion Island Shoal Buoy 7. In 1974, a depth of 32 feet was reported over the highest part of the wreck and it is not marked.

The east shore from Bowers Harbor to Traverse City at the head of the West Arm at the south end of Grand Traverse Bay is clear to within ¼ mile.

Traverse City Harbor, Mich.—This is the principal harbor on Grand Traverse Bay. The stack and chimneys of the city powerplant and the Park Place cupola, about 2,400 feet southeast of the powerplant are conspicuous. The principal cargoes are receipt of petroleum products and coal. There is good anchorage available off the city.

The Great Lakes Maritime Academy of Northwestern **Michigan College is located in Traverse City, Mich. Maritime oriented courses, including seamanship, navigation, communication, and maritime law, prepare cadets for positions aboard Great Lakes ships. Further information may be obtained from The Dean of Admissions, Northwestern Michigan College, 1701 East Front St., Traverse City, Michigan 49684.**

Channels.—A dredged basin is on the west side of Grand Traverse Bay about 1¼ miles north of the city limits. The harbor is formed by a breakwater extending southward from shore on the east side and a detached breakwater on the south side. In July 1978, the controlling depths were 14 feet in the south part of the basin except for shoaling to 13 feet in the southeast corner and 10 feet in the north part except for shoaling to 6 feet along the east edge and 3 feet in the northeast corner.

Aids to Navigation.—Traverse City Breakwater Light, 40 feet above the lake on a white skeleton steel tower, marks the west end of the harbor of refuge east breakwater extension. Traverse City West Breakwater Light, 24 feet above the water on a white pole, is on the eastern end of the west breakwater. The lighted buoy 3,200 feet northeast of Traverse City Breakwater Light is sometimes difficult to distinguish at night because of vehicle taillights on the near-shore highway.

Harbor Facilities.—A marina, 1,500 feet northwest of Traverse City Breakwater Light, provides transient berthage, gasoline diesel fuel, water, electricity, launching ramp, 30-ton mobile hoist, open and dry winter storage, marine supplies, and pump-out station. Complete hull and engine repairs are available. Depths of 7 to 15 feet were reported alongside in June 1978, with 10 feet reported available at the fuel pumps. Three docks were active south of the marina in 1978. The Traverse City coal dock, 1,000 feet southwest of Traverse City Breakwater Light, had 18 feet reported alongside in June 1978. Naph-Sol Refinery dock, 1,000 feet south of the city coal dock, extends about 600 feet from shore and had depths of 32 feet reported alongside in June 1978. The Total Petroleum, Inc. dock, about 400 feet south-southwest of the Naph-Sol dock, extends about 400 feet offshore and had depths of 23 feet reported alongside in June 1978. The two oil docks have fixed green lights at their outer ends which are lighted only when ships are expected.

The city, together with the Michigan Waterways Commission, has constructed a breakwater protecting the lakeward side of the basin between two piers about 1,000 feet northeast of the city powerplant. The basin, known as Duncan L. Clinch Yacht Harbor, forms a small craft harbor about 450 feet by 490 feet in size, with depths along the breakwater of 13 to 17 feet. The harbor entrance, located at the northwesterly corner, is about 95 feet wide. Slips to accommodate recreational craft, up **to 60 feet in length, water, electricity, lights, gasoline, launching facilities, restrooms, sewage pump-out facilities, and harbormaster services are available. The city maintains a light 18 feet above water on a pole to mark the** entrance to the harbor.

Boardman River, flowing out of Boardman Lake, passes through Traverse City by a circuitous route and empties into the south end of the West Arm of Grand Traverse Bay. The city has constructed parallel sheet-pile piers at the entrance and maintains a light on the west pier. The river is crossed by a dam owned by the city of Traverse City, about 6,500 feet above its mouth. **It has a controlling depth of about 2 feet for a distance of about 1,500 feet from the mouth and about 1 foot for the next 5,000 feet to the dam.** The current is swift.

A fixed highway bridge, with clear width of 60 feet and clear height of 11.4 feet, crosses the river 700 feet above its mouth. **Five other fixed bridges, having clear widths of 10.1 to 67 feet and clear heights of 5.4 to 16.4 feet,** cross the river below the dam. **There are other bridges** above the dam, thence to Boardman Lake.

Coast Guard Station.—U.S. Coast Guard Air Station, Traverse City, is about 2½ miles southeast of Duncan L. Clinch Yacht Harbor. The air station supports Coast Guard surface operations, carries out search and rescue missions, and renders airborne assistance. The air station can be contacted on VHF-FM channel 16 (156.80 MHz) or through the nearest Coast Guard station.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The city of Traverse City's two unmarked water intakes are located about 1,000 feet and 1,500 feet offshore westerly from the Hannah & Lay dock.

Intake and Outlet Pipelines.—The city of Traverse City, Mich., has installed two steel pipelines (intake and discharge) offshore the Municipal Bay Street Station powerhouse in Traverse City. The 42 inch water intake pipeline commences on the shoreline about 200 feet 003° from the chimney and extends about 250 feet 008½° to an intake crib in 17 feet of water. There is a depth of 5.8

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feet over the intake crib and it is not marked. The 36 inch discharge pipeline commences on the shoreline about 210 feet 338° from the chimney and extends about 190 feet 338° to an outlet structure in 6 feet of water. There is a depth of 2.7 feet over the outlet and it is not marked.

Local Harbor Regulations are established and enforced by the **harbormaster** who can be reached at the Traverse City Police Department, 520 W. Front Street, Traverse City, Michigan 49684. Copies of the regulations can be obtained from the harbormaster.

Proceeding north from Traverse City to Lee Point along the west shore of the West Arm of Grand Traverse Bay, the shoal-water contours follow within ⅜ mile of shore, except at a point about 2 miles north of Traverse City, where a shoal with only 5 feet marked by a buoy near its outer edge, reaches ⅝ mile to the east. Under Lee Point a shoal extends 2½ miles southerly from shore with 7 to 18 feet depths and marked with a buoy on the southeast edge. From Lee Point to **Suttons Point**, which is about 6 miles due west of Old Mission Point, a berth of ½ mile should be allowed. Lee Point buoy is moored ¾ mile 029° from Lee Point to mark the outer edge of the bank northeasterly from the point. Shallow water extends northerly from Suttons Point ½ mile, with 13 feet near the outer end, which is marked by a buoy.

Suttons Bay extends about 2¼ miles southwesterly into the west shore at the mid-point of the West Arm, being separated therefrom on the east by Suttons Point. It is protected except from northeasterly winds and affords good anchorage. The south and east shores may be approached within ¼ mile but, its west shore is shoal for ½ mile out. The village of Suttons Bay lies at the head of the bay. The Village and the Michigan Waterways Commission have constructed a recreational mooring facility, including a launching ramp as well as providing gasoline, oil, water, and electricity, just north of the coal dock. Limited repairs can be had in the village. The coast from Suttons Point northward to **Omena Point** has generally deep water within ⅜ mile of the shore. **Omena Bay** behind Omena Point has good water with secure anchorage and shelter from all winds from east through north to southwest. Gasoline is available at a small marina at **Omena** at the head of Omena Bay. In June 1978, a depth of 5 feet was reported alongside.

Northport Bay is an indentation between Omena Point and Northport Point and affords shelter from all except southeasterly winds. The shores of the bay are generally deep close-to, but there are two dangerous shoals lying about the middle of the bay between Northport Point and the town of Northport on the west shore; a buoy marks the southwesterly side of the westerly of the two shoals. The larger shoal, on which there are rocks awash, is ⅞ mile long, with its south end ⅝ mile west of Northport Point and marked by a buoy; the other spot, which has a least depth of 3 feet, is about ⅝ mile farther west. **Bellow Island**, lying 2⅜ miles southerly from Northport Point, is small and has shoal water for ¼ mile off its shores. Two detached 14-foot spots lie about 1 mile north of the island. A spit extends ½ mile north from the south point of Northport Bay.

Northport, Mich.—The village of Northport, and the Michigan State Waterways Commission, have constructed a small boat basin at the village waterfront. Work consists of a stone-filled timber structure extending perpendicular from shore about 350 feet, thence a steel sheet piling stone-filled structure extends northerly about 550 feet. This affords a sheltered area in which are located docking facilities to accommodate small craft with water, electricity, gasoline, diesel fuel, launching ramp, sewage pump-out facilities, and harbor attendant services. A marine railway capable of handling boats up to 65 feet in length and up to 30 tons and a mobile hoist capable of handling sailing craft up to 42 feet in length for hull and engine repairs are about 1 mile north of the village.

From Northport Point to Lighthouse Point, the shore can be safely approached to within half a mile, except for a rocky spit running ½ mile in a southeast direction from the point ¾ mile north of Northport Point. A buoy is moored in 30 feet of water 1,500 feet southeast from Northport Point, to mark the southerly end of the shoal extending therefrom. **Lighthouse Point**, the most northerly area of land between Lake Michigan and Grand Traverse Bay, is marked by Grand Traverse Light on the most northwesterly point. Shoal areas extend off the point with 13–18 feet on the most easterly side at 1 mile out, 8–19 feet rocky spit ¾ mile out on the north end, and 14–18 feet 1½ miles out on the westerly side through Cat Head Bay to Cat Head Point.

Section II.—Beaver Island Group, Mich., and Adjacent Shoals in the North End of Lake Michigan, Including the Fox Islands.

Charts 14902, 14911.—Shoals North and Northwest of Waugoshance Islands.—Waugoshance Point and off-lying islands are described in the preceding section. A group of detached reefs and spots, about 4 miles long east and west by 1½ miles in greatest width, lies with its outer or northerly limits about 3½ miles to the northward of Waugoshance Island, there being a depth of 22 feet between the shoals and the bank reaching nearly 2 miles northerly from the island, but no safe passage for large vessels. The inner one of these detached reefs is the old **Waugoshance** or **Rose Shoal** having depths of 11 to 20 feet.

New Shoals Nos. 1, 2, and 3, the outer shoals of the above-mentioned group, are situated along the south side of the vessel course, southeasterly from White Shoal Light, as follows: New Shoal No. 1, the most easterly and largest of the three, is composed of cobblestones and boulders, the least depth of about 15 feet lying 4¾ miles southeasterly from White Shoal Light. New Shoal No. 3, the most westerly, with least depth of about 16 feet, lies 2¼ miles southeasterly from White Shoal Light; it is marked at its northwesterly end, on the easterly side of the course through Grays Reef East Channel, by a buoy. New Shoal No. 2, with least depth of 17 feet, is about midway between the other two; a buoy marks its northerly edge.

White Shoal Light, 125 feet above water on a red and

white spirally banded conical tower, is located 6 miles northwesterly from the westerly end of Waugoshance Island. Riprap extends horizontally out from the tower base about 25 feet and should not be passed close aboard even by vessels of shallow draft. An air diaphragm-foghorn is operated at this light. **White Shoal** extends westerly from the lighthouse about 1¼ miles, and is awash at its westerly end, which is marked by a buoy. Several additional shoal areas having more than 20 feet also exist around White Shoal.

Simmons Reef is 5¼ miles northwesterly from White Shoal and 9½ miles northeast of Hog Island. The shoal with 21 feet or less depth has a length of about 2½ miles east and west and width of 1¼ miles north and south, with central depths of 1 to 3 feet and spots and patches of very shallow water scattered well over the entire area. A buoy is moored on the southerly edge of the shoal. This area is dangerous in that the shoal makes up quickly from deep water to a flat covered with large boulders, in the center of which is the reef proper.

Fagan Reef is about 2½ miles northwesterly of Simmons Reef and about 8 miles north of Hat Island. The reef is 4 miles long east and west by about 2 miles wide, with numerous shoals under 24 feet in depth, and least depth of 10 feet at its westerly end, about on longitude 85°20′.

St. Helena Island and Shoal, Manitou Paymen Shoal, and other shoals along the north shore, are described under the Lake Michigan North Shore section.

Chart 14911.—Grays Reef Passage and Southward.—This passage lies between Vienna Shoal and Grays Reef.

Vienna Shoal, with only 12 feet depth, lies 2⅝ miles northwesterly from the west end of Waugoshance Island.

Grays Reef is an extensive area of shallow water over rock, which reaches from Hog Island a distance of about 8½ miles eastward and has governing depths ranging from spots awash to 18 feet. The old West Channel at the outer end of Grays Reef, formerly used by large vessels, has a width of about 1,600 feet of deep water; but it is now unmarked and vessels use the improved East Channel.

Middle Shoal, with 16 feet depth, lies about 1¼ miles southeasterly from the outer end of Grays Reef. Other detached shoals lie to the north of Middle Shoal, along the west side of the East Channel.

Grays Reef Light is located about ¼ mile southeast of the east end of Middle Shoal, an air diaphragm foghorn and a radiobeacon are operated at this station. The base of the light structure is surrounded by riprap extending horizontally out about 16 feet and should not be passed close even by small craft. This light marks the angle on the west side of the East Channel now used for navigation through Grays Reef Passage. The light will be shown in the daytime during periods of fog or low visibility in the vicinity of Grays Reef.

East Shoal, with 16 feet depth, lies about ⅝ mile southeasterly from Grays Reef Light; on its west edge is Grays Reef Passage Channel buoy marking the angle on the east side of the East Channel.

East Channel through Grays Reef Passage.—This channel, passing between Grays Reef Light and the buoy on East Shoal is the present recommended passage for large vessels. The improvement by the United States has provided a channel 3,000 feet wide, on a course 186° from just south of White Shoal Light to Gray's Reef Light, thence 217° toward North Manitou Shoal Light. The length of dredge channel to the north of Grays Reef Light is 6,500 feet and to the southwest 3,000 feet.

In 1977, the controlling depth was 25 feet in Grays Reef Passage.

In addition to Grays Reef Light and the buoy on East Shoal, the channel is marked on its west side by a buoy moored 6,000 feet north of the light station and on the east side by two buoys moored 6,000 feet north and 2,000 feet southwesterly respectively, from the East Shoal buoy.

Ile Aux Galets Light is located on the island of that name (locally pronounced skill-a-gal-lee), 7⅝ miles southwesterly from Waugoshance Island and 5¾ miles from the main shore about 1½ miles southwest of Cross Village. The light is a guide to and from the Straits of Mackinac by way of Grays Reef Passage. Shallow water reaches about ¾ mile northwesterly from the light, with a bell buoy on the outer extremity. A narrow spit with 5 to 12 feet depth extends 1¾ miles northeasterly from the light, its outer end being marked by a buoy and a detached reef with 12 feet depth is just south of the spit and about 1¼ miles easterly from the light.

Dahlia Shoal is situated about 3¾ miles southwesterly from the Ile Aux Galets Light, has a least depth of 14 feet, and is marked on its southwesterly end by a buoy. The shoal extends about ½ mile northeasterly from the buoy. A detached spot with 21 feet depth lies 1 mile northeasterly from the buoy.

Vicinity of Hog Island—Garden Island, Mich. and Area to North and West.—Hat Island, the most easterly of the Beaver Group, is a small island 3 miles east of the north end of Hog Island and is surrounded by shoals, which extend ½ mile from its north side. The island and its shoals form part of the northerly limits of the foul ground extending eastward from Hog Island and terminating in Grays Reef.

Hog Island, 5½ miles in a northeasterly direction from the northeast end of Beaver Island, is 3½ miles long north and south, and of irregular width, varying from ½ to 1½ miles; it is low and wooded and entirely surrounded by very shallow flats which reach northwesterly about 1½ miles and southerly 2½ miles from it. **Hog Island Reef** is a detached shoal with 5 feet least water on it, located 3¼ miles southeasterly from the south end of Hog Island; a buoy marks the east side of the reef. The shoal water east of Hog Island terminates in Grays Reef. On the west side a bank connects the southerly ends of Hog and Garden Islands, 3 miles distant, with no vessel passage across it. This bank extends 2½ miles south of a line connecting the southerly ends of the two islands.

Garden Island, between its southeasterly and northwesterly extremities, has a length of 5 miles, and owing to irregular projections along its sides it varies in width from 1¼ to 2¾ miles, receding to a point at either end. This island is generally high and wooded, and is sur-

rounded by shoal water. About 2⅝ miles northeasterly from the northwesterly point is Garden Island Shoal, running about 1⅛ miles east and west, with depths of 15 to 20 feet, and marked at its easterly end by a buoy. About midway between the island and the shoal is another reef about a mile long in a southeast and northwest direction, with 16 to 18 feet of water over it.

Squaw Island, the most northerly of the Beaver Group, lies with its southerly end 3 miles westerly from the northwesterly extremity of Garden Island, and is about ½ mile long thence to its north end. A bank about ¾ mile wide skirts the east, south, and west shores of the island, the limits on the east side being marked by a buoy. From the north side a shoal with depths of 6 to 16 feet reaches northeasterly 2 miles from the island and is marked at its end by a buoy. A 14-foot shoal, detached from this bank, bears northeast 1¾ miles from Squaw Island old light tower. Rocky spots with 12 to 17 feet depth over them are found 1 mile northwest of the island.

Whiskey Island, about ⅜ mile square with its faces bearing diagonally, is 1¾ miles southwesterly of Squaw Island, and 2¾ miles west of the adjacent shore of Garden Island. Shallow water extends ¾ mile from its shores generally, and about ⅞ mile to the north and east of its east point. A buoy indicates the limit of shoal water extending east from the island. About ⅝ mile off the southwesterly face of the island is an extensive bank 2 miles northwest and southeast by 1 mile across, marked by a buoy on its southerly edge; the shoal is awash a short distance northward of the buoy.

Between Garden Island and Squaw and Whiskey Islands are numerous detached spots and patches with from 1 to 14 feet of water on them, which precludes safe passage even for shallow craft unless thoroughly familiar with the area.

Lansing Shoals embrace a number of boulder shoals with less than 24 feet in depth, whose westerly limits are due north of the old lighthouse on Squaw Island, and the most southerly of which, located 4½ miles northeasterly from Squaw Island, is marked by Lansing Shoal Light, an air fog diaphone and a radiobeacon are operated at this station. The light station is equipped with long-distance telephone connection. The shoalest spot, which is just northerly of the light, is a boulder with 13 feet of water on it. Rip-rap has been placed at the base of the light structure and extends horizontally out from the base about 50 feet. The structure should not be passed close aboard even by vessels of shallow draft. The other shoals are within 2¼ miles in a northwesterly direction from the light and have depths of 16 to 24 feet.

Beaver Island, Mich., and Area to Westward.—Beaver Island, the principal member of the Beaver Group, is about 13 miles long north and south, and its width is 3¼ miles at the north end, gradually increasing to a maximum of 6½ miles near the south end. The island is wooded and bordered by bluffs on the west side, and is lower on the east side. In general it is skirted by shallow water from ½ to 1 mile offshore, but deep water approaches close to in Sandy Bay, about the middle of the east side.

Several reefs lying 1½ miles east and ¾ mile northeast of the northeast point of the island, and having depths of 8 to 12 feet, limit the draft in the passage between the banks extending, respectively, from the northeast point of Beaver Island and from the south end of Garden Island. A buoy marks the north edge of the shoal making out ⅝ mile from the northeast point of Beaver Island, with depth of 3 feet close inside the buoy.

St. James Harbor is a bight near the northeast end of Beaver Island and is the harbor for the village of **St. James**, on the northwest side of the harbor. The harbor is protected on the east by **Sucker Point** and provides protection from all but southeasterly winds. Deep water extends from the lake across the center of the harbor, with the south end of the harbor shoal. Another shoal extends westerly across the harbor from Sucker Point to St. James, with deep water on the north side of the shoal near the head of the harbor. In August 1978, the dredged channel across the shoal had a controlling depth of 14 feet except for minor shoaling along the edges.

Aids to Navigation.—On the bluff at about the middle of the south side of the island is Beaver Island Light, being a guide through the channel 9½ miles wide between Beaver and North Fox Islands. The 300-foot skeletal steel tower on which Beaver Island Light is shown, also has aircraft warning lights at the 100, 200 and 300-foot levels.

St. James Light is on the north side of the entrance and a guide into Beaver Harbor.

Vessels must be careful to avoid the shoal on the north side of the entrance, extending out from the shore at and to eastward of the light; a buoy marks the edge of the bank 750 feet south of the light, and another buoy marks the lakeward limits 4,000 feet southeasterly from the light.

Shoal water extends nearly 1 mile southeasterly from **Looney Point**, at the south side of the entrance to St. James Harbor. A buoy marks the edge of the shoal area at a point 5,000 feet southeast from St. James Light, and a bell buoy marks the lakeward limits 2⅛ miles southeast from the light. A detached bank of gravel and boulders with 14 feet of water on it lies 2¾ miles southeasterly from St. James Light.

Ferry.—Ferry service is available between St. James Harbor, Beaver Island and Charlevoix, Mich. from April to December. Reservations are required for autos, but not for passengers or freight. The ferry terminal is 2,800 feet northwest of St. James Light.

Harbor Facilities.—The Township of St. James and the Michigan Waterways Commission have provided a public dock in the village proper with mooring facilities for recreational craft. Gasoline, diesel fuel, water, electricity, ice, launching ramp, hoists up to 30 tons, sewage pumpout facilities and harbormaster services are available at the public dock.

Beaver Island Coast Guard Station, located just west of St. James Light, was deactivated in 1973.

High Island, about 3¾ miles west of the north end of

Beaver Island, is 3½ miles long north and south and is 2¼ miles wide at the north end, decreasing to 1⅛ miles at the south end. The island is wooded and has a ridge of very high sand dunes extending the whole length of its west side. Shoals reach out 1 mile from the west shore and from ½ to ¾ mile around the south end and the east shore, except at the northerly end of the latter, where deep water sets in close to the land just under the narrow point extending to the eastward at the northeast end of the island. From this point shallow water extends northward a distance of 1¼ miles and ¾ mile farther eastward than the extremity of the point. The bay at the northeast corner affords good anchorage and shelter from all but east and southeast winds.

Trout Island is situated 1⅝ miles north of the northwest corner of High Island, on a bank which connects with the shallow water reaching northerly from High Island. The passage between the two islands is not safe for boats drawing over 6 feet. Trout Island has a greatest extent of about ⅝ mile, northwest and southeast, and width of about ⅜ mile. Shoal water extends off about ¼ mile on the north, increasing to ½ mile on the east and west sides. Southwesterly from the island ⅞ to 1 mile are detached spots with 15 feet least water. Trout Island Shoal, 1⅞ miles in a westerly direction from the island, is a hard shoal with 11 feet least depth, extending about ¾ mile north and south with 18 feet or less depth; it is marked by a black buoy on its northwesterly side.

Gull Island is 6½ miles west of the south end of High Island, is 1½ miles long north and south by about ½ mile greatest width, is somewhat wooded, and is entirely low and flat. Gull Island Light is located on the offshore bank to the westward of the north end of the island. The surrounding water is generally shallow for ½ mile out, and from the southerly end a bank extends to the southeast 1 mile, and from the northerly end northeasterly 1⅝ miles including a detached 21-foot spot 1 mile northerly of the light house. **Gull Island Reef** bears southeasterly 4 miles from the south end of Gull Island, and has least depth of 3 feet, hard and stony bottom. Within the 24-foot contour this shoal is about 2½ miles long north and south and about 1 mile in greatest width near its northerly end, narrowing considerably to the southward Soundings of 9 to 15 feet are found well over the entire area.

Richards Reef, located about 8 miles westerly from Beaver Island Light, has 22 feet least water on it, and this only on one spot, which is not marked.

Boulder Reef, having least depth of 15 feet and of small extent, is located about 20 miles west of Beaver Island Light and about 4 miles north of the 267° course from abreast of this light to Poverty Island Passage. A buoy is moored in 33 feet of water about ¼ mile south of the reef, 20 miles 272° from Beaver Island Light.

Chart 14912—Fox Islands, Mich.—North Fox Island is 11¼ miles southwest of Beaver Island Light, and about 4 miles northeasterly of South Fox Island. South Fox Island is 17 miles northeasterly from North Manitou Island and 18 miles northwest of Lighthouse Point. Currents with velocities up to 2 miles per hour are of frequent occurrence around these islands and vessels should be on the lookout for them.

North Fox Island is wooded, is 2 miles long north and south and 1 mile wide at its north end, tapering to a point at the south end, which is hilly. It can be approached to within ¼ mile on its north and east sides, but on its west side near the south end, shallow water with depths of 5 to 13 feet extends off ⅞ mile, and a spit extends ½ mile south from the south point.

South Fox Island, the larger of the two Fox Islands, running in a northwesterly and southeasterly direction, is 5 miles long by about 1½ miles greatest width, diminishing to a point at either end. It is hilly on the westerly side, but lower and wooded on the east side. Around its northwesterly end shoals extend off ½ mile, and from the extreme northwest point a spit with depth of 12 to 15 feet reaches to the northwest 1⅛ miles. Detached shoals with least depths of 19, 18, and 21 feet lie respectively 1⅝ miles, 2 miles, and 3¼ miles north of the northwest point of the island. A detached 13-foot shoal is located about ⅝ mile off the westerly shore and 1¾ miles northwest from the abandoned lighthouse on the south point of the island. Shoals make out ½ mile around the south point of the island.

South Fox Island Shoals form an extensive bank reaching over 9 miles south from South Fox Island, having general depths of 18 to 30 feet, but with least depths on shoal spots as follows: A 9-foot spot bears southerly from South Fox Island Light structure, distant 4¼ miles: the bottom in the vicinity is rocky, the soundings irregular, and deeply laden vessels should navigate carefully in thick or foggy weather. A 9-foot spot bears southerly 7¼ miles from the lighthouse; other shoals with 11 feet are found for 1 mile north of this spot, and 1½ miles south of it there are spots with 17 to 19 feet depth.

A buoy is moored off the southerly limit of the shoal group at a point 9 miles south of South Fox Island Light structure. A deep passageway through the shoals is marked on its north side by a buoy located 4½ miles southerly from South Fox Island Light structure, and on its south side by a buoy located 6⅓ miles southerly from the lighthouse.

Section III.—Easterly Shore From Grand Traverse Light to Point Betsie, Mich., Including the Manitou Islands.

Charts 14902, 14912, 14913.—Lighthouse Point, the most northerly area of land between Lake Michigan and Grand Traverse Bay, is marked by Grand Traverse Light on the most northwesterly point. The area southwest of Grand Traverse Light through **Cathead Bay** to **Cathead Point** is shoal with two rocky shoal spits reaching out about ¾ mile from shore. Cathead Point and Bay afford shelter in southerly winds. In approaching Cat Head Point from the southwest, a clump of trees on the extremity of the point gives it the appearance of an island.

Between Cathead Point and Carp River Point most of the shore is bluff and hilly. Leland Harbor is 1¼ miles northeast of Carp River Point. Detached shoals

with 7 to 8 feet least water over them bear 3¾ miles northeasterly from the piers at Leland and are from 1 to 1½ miles from the neighboring shore. Otherwise, the coast from Cathead Point to Carp River Point is clear of outlying dangers and may be approached to within ¾ mile.

Chart 14912—Leland Harbor, Mich.—This harbor is located at the mouth of the Leland River, about 40 miles northeasterly from Frankfort and about 35 miles southwesterly from Charlevoix. Local fish tugs ply in and out of the harbor throughout the year.

Channels.—The harbor is protected on the north and northwest by a detached breakwater and on the southwest by a pier extending lakeward from the south side of the mouth of Leland River. An anchorage area inside the breakwater is approached from the southwest through a dredged channel between the breakwater and pier. A dredged channel leads from the south end of the anchorage to the mouth of the river, and a marina basin, maintained by private interests, is on the east side of the anchorage.

In August 1978, the controlling depths were 12 feet in the entrance channel except for shoaling along the edges, thence 10 feet in the anchorage area except for shoaling along the northwest limit, thence 6 feet in the channel to the mouth of the river, and 4 feet in the marina basin except for shoaling to bare in the north end.

Aids to Navigation.—Leland Harbor Light 2, mounted 25 feet above the water on a white column, is located on the outer end of the south pier. Leland Breakwater Light 1 is mounted on a white column on the south end of the breakwater.

Ferry.—Mail and ferry service is available between Leland and North and South Manitou Islands from April through December with regular service. Irregular service is available from January through March depending on ice conditions. The terminal is at the eastern bank of the Leland River mouth.

Harbor Facilities.—Leland Township and the Michigan State Waterways Commission completed construction in 1968 of launching and docking facilities within the harbor. Slips for small craft are available with water, electricity, gasoline, diesel fuel, sewage pump-out facilities, and harbor attendant services provided. The dock is operated by the Township of Leland.

Leland River is a narrow and crooked stream about 4,000 feet long, connecting Lake Leelanau with Lake Michigan. Above the dam and about 250 feet east of it, the river is crossed by the fixed highway bridge, at Main Street, with headroom of about 4 feet. From this bridge to Lake Leelanau the river is navigable for vessels of shallow draft.

Lake Leelanau is about 16 miles long and its width varies from about 200 feet to 1¾ miles. The upper and lower portions have depths of from 30 to 60 feet, but in the narrows in the southeast section of the lake near the village of Lake Leelanau, only about 3 feet draft is available. A fixed bridge with headroom of about 15 feet crosses the lake at the village.

Good Harbor Bay, lying between Carp River Point and Pyramid River Point, has good water close in to the shore and affords protection in all winds except from the north and northeast. The northeasterly portion of this bay, however, is obstructed by an extensive rocky shoal area with detached spots, having depths varying from 2 to 18 feet and lying within an arc between the bearings 248° and 213° from Carp River Point, the nearest spot being 2 miles distant therefrom and the farthest 3¼ miles. The most northerly spot, with 3 feet of water on it, is close south of a line joining Carp River Point and Pyramid Point, distant 2¾ miles from the former; the shoal nearest the mainland is 1⅛ miles from the shore of Good Harbor Bay about 2¾ miles south of Carp River Point.

The **Pyramid Point Shoal** area, with limiting depths of 7 to 12 feet, lies north and northeasterly of Pyramid Point within a distance of 2 miles; a buoy marks the northwesterly side of the shoals.

Just north of **Sleeping Bear Bay** and about 3 miles southwesterly from **Pyramid Point**, a rocky spit with 4 feet of water runs ⅝ mile from shore, and a shoal reaches nearly ½ mile off the shore for a distance of 1 mile south of the spit. Very good holding ground is found under Pyramid Point which is bluff. Sleeping Bear Bay, an indentation east of Sleeping Bear Point and south of the Manitou Islands, affords good shelter from west through south to northeast winds. At **Glen Haven**, on the westerly shore of Sleeping Bear Bay, only ruins remain along the waterfront, and no services are available. Sleeping Bear Shoal, composed of boulders, with 17 feet depth, lies 1 mile offshore west of Sleeping Bear Point, and a buoy is moored about five miles west of the point. Vessels using Manitou Passage should keep to westward of the buoy.

Manitou Islands and Passage, Mich.—The two Manitou Islands, **North Manitou** and **South Manitou**, lie about 6¾ miles north-northwesterly from the main shore at Pyramid Points and Sleeping Bear. Between the mainland and the islands is Manitou Passage, used by large vessels proceeding to and from the south end of Lake Michigan. An ample width of deep water will be found by giving the shoals off Pyramid Point a good berth and passing to southward of the aids marking the shoal area south of North Manitou Island. The islands are about 3¾ miles apart northeast and southwest, with deep water between them.

Ferry.—Mail and ferry service is available between North and South Manitou Islands and Leland during most of the year, depending on ice conditions.

North Manitou Island is 7 miles in length north and south by about 4¼ miles in width east and west at the north end and about 2 miles at the south end; in general it is hilly and wooded. A lee can be found under North Manitou, with generally good holding ground. The bight on the east side affords good shelter from westerly winds. The north shore is deep-to, the east shore clear to within ⅜ mile, and the west shore to within ½ mile. Shoals with 4 to 15 feet depths extend off 1½ miles from the most southerly point of the island, and thence to the most easterly point of the south shore of the island, shoals with 11 to 15 feet are found 2 miles southerly from shore.

In addition to the shoals above mentioned off the south side of the island, an area of foul ground with limiting

depths of 16 to 30 feet extends southerly a distance of 3½ miles from the most southerly point and distance of 3 miles from the easterly point. The southwest end is marked by a buoy and the southeast end by North Manitou Shoal Light; an air diaphragm foghorn and a radiobeacon are operated at this station.

South Manitou Island, the smaller of the two Manitous, is a national lakeshore operated by the National Park Service. A public dock and camping facilities are available. The island is 3½ miles long north and south by 3¼ miles greatest width east and west, and is hilly and bluff on the west side and lower and wooded on the east side. All its shores are deep close-to except the southerly, from which shoals with 10 to 19 feet depths extend ¾ mile; a detached 18-foot spot lies 1½ miles southerly and a 19-foot spot lies 2¾ miles southwesterly from the most southerly point of the island, the latter is marked by a buoy.

South Manitou Harbor, in the east side of the island and semicircular in shape, is protected from all winds from northeast through west to southwest and has deep water with good holding ground.

Wreck.—The 283-foot freighter **Francisco Morazan** went aground on the southwest end of South Manitou Island in November 1960. In 1962 the wreckage was on level keel in 8 feet of water with the main part of the hull and superstructure exposed above the water. Examination in 1967 disclosed the wreck has listed 3° to starboard, with deck and hull plating cracked through below the water line at a location just forward of the superstructure. Examination in 1974 revealed separation of the bow section from the remaining superstructure.

Caution Area.—Ninth Naval District Naval Reserve training ships conduct surface and antiaircraft firing during maneuvers in a large area north and west of the Manitou and Fox Islands. Mariners are advised to consult U.S. Coast Guard Ninth District Notices to Mariners for limits of the maneuver area, schedule of operations and instructions.

Empire Bay is a bight of navigable water about 8 miles across and with but little indention, formed by shoals jutting out in a westerly direction from Sleeping Bear Point as a northern limit and by Empire Bluffs as a southern limit.

At Empire, a village near the northerly end of Empire Bluffs, two bridge piers, built by local enterprise, formerly extended into Lake Michigan, but in 1978, had nearly all disappeared into the sand. Sleeping Bear hill, a prominent landmark, is about 2½ miles south of Sleeping Bear Point and 5½ miles north of Empire Bluffs. South and west of Empire Bluffs to Platte River Point is **Platte Bay.** All this shore is bold, bordered by high bluffs, and may be approached to within ⅜ mile, except in the immediate vicinity of Sleeping Bear Point, as below mentioned.

At Platte River Point, the **Platte River** enters Lake Michigan, and a rocky shoal extends to the north nearly 1½ miles, with depth of 1 foot ¾ mile from shore and about 10 feet near the outer end. Tending southwesterly from **Platte River Point**, the coast is bold and hilly with no off-lying shoals to Point Betsie, about 5¾ miles distant.

Section IV.—East Shore From Point Betsie to Big Sable Point, Mich.

Charts 14902, 14907.—From **Point Betsie** (a rounding sandy point) southerly about 4½ miles to Frankfort, the coast consists of sand dunes and hills. There are no outlying obstructions.

At the outer end of Point Betsie, Point Betsie Light, marks the turning point for vessels bound to and from the south end of Lake Michigan through the channel to the eastward of the Manitous. A radiobeacon is operated at the light station.

Frankfort Harbor, Mich.—The shore near Frankfort is bluff, with a maximum elevation of about 325 feet above the lake. The harbor is located in Lake Betsie, or **Aux Becs Scies**, lying just within the shoreline of Lake Michigan and connected by an entrance **channel**, about 54 miles 101° across the lake from Sturgeon Bay Canal. The city of Frankfort is on the north side of Lake Betsie. A tank on a hill about 2,300 feet north-northeast of the Coast Guard station is prominent.

Car ferries ply throughout the year between this harbor and Kewaunee, Wis.

Channels.—The harbor is entered from Lake Michigan through a dredged entrance channel between converging breakwaters to an outer harbor basin which is not adapted for anchorage but reduces wave action in the inner harbor. From the outer basin, the channel continues eastward between parallel piers to an inner basin and anchorage area in Lake Betsie.

In April-May 1978, the controlling depths were 25 feet in the entrance channel except for shoaling to 24 feet along the edges, decreasing to 20 feet between the piers, thence 18 feet in the inner basin except for shoaling in the northwest, northeast, and southeast corners, thence 7 to 10 feet in the anchorage area.

Currents in the entrance channel attain velocities of up to 3 m.p.h. in either direction.

Mooring to the breakwaters, piers, or revetments is prohibited.

A private channel extends from the inner basin eastward through Lake Betsie to a private dock. In 1975, the controlling depth in the channel was 7 feet.

Submerged Crossings.—There are two submarine cables (1 power and 1 control) across the outer basin from the U.S. Coast Guard building approximately 300 feet north of the north pier to the north breakwater light.

Lake Betsie is about 1½ miles long and from 1,000 to 2,000 feet wide extending from the west into the southeast. It is generally shoal, with 8 feet or less, except in the vicinity of the car-ferry slips. Submerged piles are located in the southeasterly section and continuing into a swamp opposite the town of Elberta where the **Betsie River**, a small shallow stream flows into the head of Lake Betsie. There are no bridges. The anchorage is poor; mooring facilities exist at Frankfort.

Betsie River is crossed near its mouth by a highway bridge with fixed clear span of 55 feet between abutments and height of 4.7 feet, and by the Ann Arbor Railroad bridge with fixed clear span of 14 feet and headroom of 7.5 feet.

Aids to Navigation.—Frankfort South Breakwater Light is on the end of that breakwater on the south side of the harbor entrance.

North Breakwater Light is on the outer end of that breakwater, on the north side of the entrance; a fog signal is at the light.

North Pierhead Light is on the end of the inner north pier, with a fog signal. South Pier Light is on the end of the inner south pier. A marker radiobeacon is at the Coast Guard station, about 500 feet northeasterly of North Pierhead Light.

An aerobeacon, 470 feet above the lake, is 9,500 feet 052° from the radiobeacon station at Frankfort.

Ferry.—The Ann Arbor Railroad provides year-round ferry service between Frankfort and Kewaunee, Wis. The ferries transport railroad cars, autos, trucks, and passengers. Reservations are required for cars and trucks during the summer months. The terminal is on the south side of the entrance basin to Lake Basin.

Harbor Facilities.—Koch Fuels, Inc. receives petroleum products at a dock between the ferry slips. The City and Michigan Waterways Commission have provided a recreational docking facility on the north side of Lake Betsie which is available and maintained exclusively for transient craft. Water, electricity, sewage pump-out facilities, lights, gasoline, restrooms, showers, and harbormaster services are available. There is a marine railway capable of handling small craft.

Coast Guard Station.—Frankfort Coast Guard Station is located on the north side of the harbor entrance.

Navigation Regulations.—See 33 CFR § 162.120 in Rules and Regulations, preceding.

The lake shore from Frankfort to Portage Lake, Mich., 18½ miles southerly, is deep-to, bold, and wooded, and marked by many high hills ranging from 300 feet to 400 feet, the highest one being found about 7 miles south of Frankfort, between Lower Herring and Arcadia Lakes. **Lower Herring Lake** is about 5 miles south of Frankfort and Arcadia Lake, which is also Arcadia Harbor, is 4½ miles further or 8½ miles northerly of the Portage Lake piers.

Arcadia Lake is about 4,800 feet long north and south, with an extreme width of about 3,400 feet in the southern part. From the north end, about 2,800 feet of the length of the lake is from 250 to 750 feet wide and up to 26 feet deep, with the 6-foot contour following very close to the shore line. This part of the lake is parallel to the shore line of Lake Michigan and separated from it by a narrow strip of land from 325 to 750 feet wide. The larger, southern portion has depths of 7 feet and upwards in its western section adjacent to the entrance, and shoals off into heavy weeds and marsh at the east end, where it receives its only stream, Bar Creek.

Arcadia, Mich. is a village at the north end of Arcadia Lake about 14 miles south of Point Betsie.

Arcadia Lake is entered from the deep water in Lake Michigan through a dredged entrance channel between parallel piers and revetments to the deep water inside the lake. In August 1978, the controlling depth in the entrance channel was 8 feet except for shoaling to 2 feet along the north limit. The entrance channel is subject to extensive shoaling. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Aids to Navigation.—The south pier is marked by a lighted buoy located approximately 500 feet lakeward of the west end of the structure. The lighted buoy is placed about 1 May and removed about 1 November.

Harbor Facilities.—Docks and a ramp have been constructed along the east side of the north arm of the lake and water, electricity, and harbormaster services are available. Gasoline, launching ramp, 5-ton hoist, pump-out station, limited marine supplies, and repairs to hulls and motors are available at a marina north of the public facility.

About 23 miles due west of the entrance to Arcadia Lake is the deepest section in Lake Michigan with a recorded depth of 923 feet at low water datum.

Charts 14907, 14939—Portage Lake Harbor, Mich.—This harbor is in **Portage Lake,** which is about 3½ miles long and from ½ to 1½ miles wide. It has depths of from 14 to 60 feet. The westerly end is about 1,000 feet from Lake Michigan and connected therewith by a protected entrance channel, distant about 60 miles 124° across the lake from Sturgeon Bay Canal.

Channels.—The dredged entrance channel leads from Lake Michigan between parallel piers and revetments to the deep water inside Portage Lake. In 1977–May 1978, the controlling depth in the entrance channel was 9 feet. The channel is subject to shoaling from sand swept in by shore currents. The currents in the entrance channel attain velocities up to 3 m.p.h. in either direction.

Mooring to the piers and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Aids to Navigation.—Portage Lake North Pierhead Light, 44 feet above the water on a white skeleton tower set on a concrete base, is about 70 feet from the outer end of the north pier. Portage Lake South Pierhead Light, 27 feet above water on a white steel pole structure is on the outer end of the south pier. Portage Lake Inner Light, 17 feet above the water on a skeleton tower, is at the easterly end of the south pier in Portage Lake.

Harbor Facilities.—A marina on the south shore of the lake just east of Eagle Point offers limited transient berthage, gasoline, diesel fuel, water, electricity, a 14-ton mobile hoist, and a 50-ton marine railway. Open and covered winter storage, marine supplies, a pump-out station, and complete hull and engine repairs are available. Depths of 5 to 12 feet were reported alongside in June

1978 with depths of 10 feet reported alongside the fuel pumps in June 1978. The village of **Onekama** is on the north side of the easterly end of Portage Lake, about 3 miles from the entrance. Anchorage in the lake is good and mooring facilities in the eastern end of the lake can accommodate craft up to 50 feet in length.

Navigation Regulations.—See 33 CFR § 162.120 in Rules and Regulations preceding.

Chart 14907.—The land from Portage Lake 8½ miles southwesterly to Manistee continues somewhat bluff, generally 60 feet in height, with a few hills from 115 to 180 feet high. The shoal border is ½ mile or less in width.

Charts 14907, 14938—Manistee Harbor, Mich.—This harbor is located within **Manistee River,** which flows from the **north end of Manistee Lake about 1½ miles to Lake** Michigan, with a protected channel at the entrance, and **is about 117 miles 034° across the lake from Milwaukee Harbor. The city of Manistee has an extensive harbor front along both sides of the river and the westerly shore** of Manistee Lake. Local fish tugs ply in and out of the harbor throughout the year. Principal cargo of the port is coal receipts, and occasional shipments of salt and machinery from the docks along the western shore of Manistee Lake. North Pierhead Light and a lighted radio mast at the north end of the lake are prominent in the approach to Manistee.

Channels.—The entrance to Manistee River is protected on the southwest by a breakwater. A dredged entrance channel leads from deep water in Lake Michigan on the north side of the breakwater to an outer harbor basin, thence betweene parallel piers through the mouth of the river and upstream for 1.6 miles to Manistee Lake.

In May 1978, the controlling depths were 25 feet at midchannel in the entrance channel through the outer basin, thence 23 feet at midchannel between the piers, thence 18 feet on the channel centerline through Manistee River to Manistee Lake.

Currents in the river attain velocities up to 3 m.p.h. in either direction.

Numerous submerged pile clusters extend along the north channel limit from the outer end of the north pier to its inner end. Large pile clusters protect each end of the revetment upstream of the north pier.

The outer basin, enclosed by the south breakwater and north pier, is not adapted for anchorage, but reduces wave action in the inner harbor. Mooring to the breakwater, piers, or revetments is prohibited. Large riprap stone is present along both sides and across the ends of the breakwater and pier, and navigation should not be attempted close to these structures.

Aids to Navigation.—Manistee North Pierhead Light is near the outer end of the north pier and is shown 55 feet above the water from a white cylindrical tower. A foghorn at the light sounds as required. Manistee South Pierhead Light is on the outer end of the south pier. South Breakwater Light is on the outer end of the south breakwater and shows 45 feet above the water from a skeleton tower.

Harbor Facilities.—The city and Michigan State Waterways Comm. completed construction in 1968 of public docking facilities located on the southerly side of the Manistee River in downtown Manistee approximately 1,500 feet east of the harbor entrance. Slips for small boats are available with water, electricity, gasoline, oil, pump-out facilities, and harbor attendant facilities provided. Diesel fuel is available at a marina on the opposite bank about 700 feet downstream from the public facility. A marina at the north end of Manistee Lake with no transient berthing, has a 20-ton marine railway, and hull and engine repair facilities.

Coast Guard Station.—Manistee Coast Guard Station, seasonally operated, is on the north side of the entrance to Manistee Harbor.

Navigation Regulations.—See 33 CFR § 162.120 in Rules and Regulations, preceding.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding, and 33 CFR § 117.641, published in Rules and Regulations, preceding.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 51, Manistee county. R 281.751.1. Manistee harbor entrance channel; speed restriction.

1. On the waters of the Manistee harbor entrance channel eastward from a line connecting the south breakwater light and the north pierhead light to the easterly end of the channel at Manistee lake, city of Manistee, county of Manistee, state of Michigan, * * *

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 51, Manistee county. R 281.751.5. Manistee river; slow—no wake speed.

5. On the waters of the Manistee river, Manistee township, Manistee county, from 100 feet east of the highway bridge, section 31, town 22 north, range 16 west, downstream to 100 feet below the railroad bridge on section 36, town 22 north, range 17 west, * * *

Local Harbor Regulations.—Harbor regulations have been established by the city of Manistee, and are enforced by the **harbormaster.** Copies of regulations may be obtained from the Chief of Police at City Hall. A **slow-no wake speed** limit is enforced.

Manistee Lake is about 4 miles long, ¼ to ½ mile wide, and has a maximum depth of 50 feet, with deep water generally close to shore. Seven buoys mark the limits of shoals and submerged dock ruins along the lake toward Filer City.

In Manistee Lake, a buoy marks the southwesterly edge of the shoal on the east side of the channel opposite the old abandoned lumber docks.

Big Manistee River, entering Manistee Lake at its north end, flows through a flat valley with numerous cutoffs and sloughs, and is crossed by a number of fixed bridges. The channel is tortuous, with depths varying from 1½ to 11 feet to a dam which crosses the river about 30 miles above the mouth.

Continuing along the coast from Manistee to Big Sable Point, 16 miles southwesterly, the intervening coast is bluff with a few hills, and the water deep at ⅜ mile out.

Structures Across Manistee River from Mouth to Manistee Lake

No.	Location and name	Kind	Miles above mouth of river	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Submerged 12″ pipeline	Water	0. 65						Approx. depth 28 feet.
2	Maple Street bridge	Highway	1. 10			101. 0	23. 6		Bascule, See Note 1.
3	Submerged cable	Telephone	1. 27						Mich. Bell Tele. approx. depth 24 feet.
4	Submerged tunnel	do	1. 27						Mich. Bell Tele. depth unknown.
5	Submerged 6″ pipeline	Gas	1. 29						Mich. Cons. Gas approx. depth 30 feet.
6	Submerged cable	Telephone	1. 37						Mich. Bell Tele. on river bottom.
7	U.S. 31 (Memorial) bridge.	Highway	1. 40			120. 3	32. 5		Bascule, See Note 1.
8	C. & O. RR bridge	Railway	1. 50			100. 0	13. 5		Swing. See Note 2.
9	Submarine cable		1. 65						City of Manistee approx. depth 22 feet.
10	Submarine cables (3)	Electric	1. 66						Mich. St. Hyw. Dept. approx 28.5 feet.
11	do	do	1. 74						Manistee and Northeastern Rw. approx. depth 28 feet.
12	Aerial cable	Electric	1. 85				145. 0		Consumers Power Co.

Whistle Signal for Opening Draws: 2 long, 1 short (— — —). Bells on bridges are sounded before opening draws.

NOTE 1.—Two red lights on each abutment; 2 compound red-and-green lights, on each leaf at the opening, show red up and down stream when bridge is closed and green when open.

NOTE 2.—Red lights on each end and at center of right-fender protection; red light at center of left fender protection; two lights on each side on top of bridge show red when bridge is closed and green when open.

Section V.—East Shore From Big Sable Point to Little Sable Point, Mich.

Big Sable Point has hills rising inland, with a lower shoreline. Big Sable Light, 106 feet above the water, is shown from a conical tower with the middle third and top black and the remainder white with a dwelling attached.

Between Big Sable Point and Ludington is a stretch of 7½ miles bearing southeasterly, with no shoals beyond ⅝ mile offshore. One and one-half miles beyond Big Sable Point is the mouth of **Big Sable River**, the outlet of **Hamlin Lake**. A dam crosses the river at the west end of the lake. Four and one-half miles further to Epworth Heights on **Lincoln Lake** the entrance to the lake is nearly closed due to shoaling across the entrance piers. Bluffs increasing in height from the shore inland attain an elevation of 120 feet generally, and of 180 feet at a point ⅞ mile north of Epworth Heights. From Epworth Heights to Ludington, the land is low.

Charts 14907, 14937—Ludington Harbor, Mich.—This

harbor is located in Pere Marquette Lake, which lies just within the Lake Michigan shore line with a protected entrance at its north end, and is about 97 miles 045° across the lake from Milwaukee Harbor. Prominent in the vicinity of Ludington are North Breakwater Light, the lighted stack at Dow Chemical U.S.A., about 1½ miles southeast of the breakwater entrance, and Father Marquette Memorial Cross about ¾ mile south-southeast of the entrance.

Car-ferry steamers ply throughout the year between Ludington and Milwaukee, Manitowoc, and Kewaunee, Wis.

Channels.—A dredged entrance channel leads eastward from deep water in Lake Michigan between converging breakwaters to an outer harbor basin. From the basin, the channel leads between parallel piers and revetments to the north end of Pere Marquette Lake.

In April-June 1978, the controlling depths were 23 feet from deep water in the lake in the approach channel, 23 feet in the channel through the outer basin with 18 feet in the basin areas on the north and south sides except for shoaling to 5 feet along the south limit of the south basin, thence 22 feet through the channel between the piers to Pere Marquette Lake except for shoaling to 16 feet along the south channel edge.

The outer basin is not adapted for anchorage of vessels, but reduces wave action in the inner harbor. Mooring to the breakwaters, piers, and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Aids to Navigation.—North Breakwater Light is on the north side of the entrance on the west end of the breakwater and is shown 55 feet above the water from a white square pyramidal tower. A foghorn and a radiobeacon, synchronized with the fog signal for distance finding, are operated at this station. The radiobeacon antenna is located 2,260 feet 094° from Ludington North Breakwater Light. South Breakwater Light is on the south side of the entrance, on the west end of the breakwater. North Pierhead Light is located near the outer end of the pier; an electric fog siren sounds at this light. South Pierhead Light is located near the outer end of the south pier. The North Breakwater and North Pierhead Lights form a range, bearing 098° marking the approach to the harbor.

Pere Marquette Lake Light is located on the south pier at the angle near its east end.

Caution.—Northwest and southwest winds make entry between the breakwaters hazardous. Vessels usually increase their speed until just inside the breakwaters to compensate. Small-craft operators transiting from south to north have reported that South Breakwater Light is sometimes difficult to see because of the brilliance of North Breakwater Light.

Coast Guard Station.—Ludington Coast Guard Station is located on the north side of the harbor entrance. A Coast Guard Marine Inspection Office is at 218 West Ludington Avenue, Ludington, Mich. 49431.

National Weather Service Warning Display Station.—Signals are displayed from a steel tower at the Coast Guard station, and from a flagpole in Ludington Park at the end of Loomis Street.

Captain of the Port Areas.—See 33 CFR § 3.45-80 in Rules and Regulations preceding.

Navigation Regulations.—See 33 CFR § 162.120 in Rules and Regulations preceding.

Pere Marquette Lake is about 2 miles long, including a marsh at its head at the southerly end, has an average width of ½ mile, and is up to 43 feet deep. The anchorage is good; wharves are found along the easterly side of the lake. Pere Marquette River, which flows into Pere Marquette Lake, is not navigable above the lake, except for rowboats and small launches.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 53, Mason county.

R 281.753.8. Pere Marquette river, from Indian bridge downstream; slow—no wake speed.

8. On the waters of the Pere Marquette river, Mason county, from Indian bridge, section 23, town 18 north, range 16 west, downstream to the north line of section 26, town 18 north, range 18 west, * * *

Cable Area.—A cable crosses the navigation channel at the easterly end of the inner piers. The armored submarine cable of the General Telephone Co., Muskegon, Mich., was placed in 1972. It commences at the shoreline at the foot of Ferry Street and extends about 800 feet 167° to the south shore. It is buried at least 6 feet below the channel bottom.

There is a fixed highway bridge on the line of Washington Avenue across a small side channel or bayou, having four spans with a clear width of 51.0 feet in the channel span and clear height of 12.5 feet above Low-Water Datum. The commercial harbor is along the city front of Ludington, occupying the east side of Pere Marquette Lake.

Aids to Navigation.—A buoy is located in Pere Marquette Lake 4,210 feet 149½° from Pere Marquette Lake Light to mark the outer end of submerged piles and dock ruins.

Buoys mark the north side of the channel leading to small-craft facilities in the inlet on the northeast side of Pere Marquette Lake.

Ferry.—Ferry service is available from Ludington to Milwaukee, Manitowac, and Kewaunee, and return during the summer for autos and passengers. Reservations are advised for autos. Railroad cars are ferried throughout the year. The terminal is about ½ mile southeast of Pere Marquette Lake Light.

Harbor Facilities.—Western Concrete Products Co., about 2,000 feet east of the C & O car ferry docks, receives lime and limestone. Dow Chemical Co., about ½ mile south of Western Concrete Products Co., receives limestone and bunker C fuel for plant consumption and ships chemical products. Sand Products Corp., about 1,900 feet southwest of Dow Chemical Co., makes shipments of sand. A marina just east of the Washington Avenue bridge in the northeast arm of the lake has transient

berthing, gasoline, water, electricity, launching ramp, 20-ton hoist, and pump-out service available. Hull and engine repairs are available at the north end of the lake near the entrance.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake is located 2,800 feet north of the harbor entrance and extends 3,000 feet to a crib with 31 feet over. It is not marked.

Ludington Pumped Storage.—Consumers Power Company jointly with the Detroit Edison Company has constructed two cellular/rubblemound jetties extending 1,600 feet lakeward from shore and a 1,500-foot rubblemound breakwater with a north-south bearing located 2,700 feet off shore at the Ludington Pumped Storage Electric Plant located about 4 miles south of Ludington, Michigan. Navigation should not be attempted close to these structures.

Aids to Navigation.—The Ludington Pumped Storage Facility structures are marked with white flashing buoys located off both ends of the rubblemound breakwater and off the west end of both the north and south jetties. There is also a white flashing buoy located about midway between the west end of the jetties and the north and south ends of the breakwater. A series of buoys and floats supporting chain barriers extend between the ends of the jetties and breakwall preventing any navigation between them.

Chart 14907.—Between Ludington and Pentwater, Mich., 12 miles southerly, the land is bluff and hilly, with height of 150 to 250 feet, and the shoal-water contours are regular and close inshore. The outlet of Bass Lake, located about 8½ miles southeast of Ludington and 3½ miles north of Pentwater piers, is completely blocked by a dam and sand at the Lake Michigan shoreline, and its water level is about 3 feet above the plane of Low Water Datum for Lake Michigan.

Pentwater Harbor, Mich.—This harbor is located in Pentwater Lake, lying near the Lake Michigan shoreline and entered through a revetted channel, and is about 91 miles 056° across the lake from Milwaukee Harbor. The harbor facilities are at the village of Pentwater, on the northerly side of Pentwater Lake close to the entrance.

Channels.—The dredged entrance channel leads from deep water in Lake Michigan southeasterly between piers and revetments to the north end of Pentwater Lake. In July 1978, the controlling depth was 9 feet through the entrance channel to Pentwater Lake except for shoaling along the edges. The outer end of the channel is subject to extensive shoaling. Currents in the channel attain velocities up to 3 m.p.h. in either direction.

Mooring to the piers and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Aids to Navigation.—Pentwater North and South Pierhead Lights are near the outer ends of the north and south piers, respectively.

Harbor Facilities.—Pentwater Lake is about 2 miles long and ½ mile wide, and has depths of 25 to 50 feet. Anchorage in the lake is good; mooring facilities exist at Pentwater. Pentwater River, entering the head of the lake, has a depth of about 1 foot, and is crossed by a fixed highway bridge.

The Village of Pentwater and the Michigan Waterways Commission have jointly constructed a public docking facility on Pentwater Lake in the northwest section of the lake to the southeast of the lake entry between the piers. Water and electricity are available.

A marina just southeast of the public facility has transient berths, gasoline, diesel fuel, water, electricity, a 16-ton hoist, open and covered winter storage, limited marine supplies, pump-out station, and hull and engine repair facilities.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding.

R 281.764.3. Pentwater lake and entrance channel; slow—no wake speed.

3. On the waters of the Pentwater lake and the entrance channel to Pentwater lake, village of Pentwater and township of Pentwater, county of Oceana, state of Michigan, from the Pentwater entrance channel pierhead to a line drawn from Popp's point in the village of Pentwater westerly to the west shore of Pentwater lake, * * *

From Pentwater to Little Sable Point, a distance of about 10 miles, the shore has a general direction of southwest and is an almost continuous line of bluffs. The point is marked by Little Sable Point Light.

Wreck.—The steamer *Anna C. Minch* broke up in two pieces and sank during the storm of November 11, 1940. The wreckage generally is about 1⅝ miles 216° from Pentwater Pierhead Light. An examination in October 1968 showed a clear depth of 18 feet over the wreck.

Wreck.—The wreck of the *Novadoc* lies close to shore, about 3¼ miles 021° from Little Sable Point Light. Investigation in September 1965 showed a depth of less than one foot over a projecting steel portion of the wreck. It is a menace to small boat navigation, especially at high lake stages, when it is totally submerged. A buoy in 12 feet of water is located about 200 feet off the west corner of the wreck. It is recommended that all vessels avoid passing between the shore and the unlighted buoy marking the wreck.

Wreck.—A wreck, located 4,500 feet 190° from Little Sable Light, with ½ foot over, is located close to shore. It is unmarked.

Section VI.—East Shore From Little Sable Point to St. Joseph, Mich.

Chart 14907.—Little Sable Point is broad, rounding, and marked by Little Sable Light, 108 feet above the water, and shown from a red brick conical tower. From Little Sable Point to White Lake, the coast trends generally southeasterly about 20 miles and is quite rugged, with no shoals beyond ½ mile from shore.

Stony Lake, Mich.—The village and lake of the same name are about 6½ miles south of Little Sable Light.

Stony Lake empties into Lake Michigan through **Stony Creek**, which is not navigable. The only remainder of the former lumber loading facilities at the mouth of Stony Creek are some rows of old piles.

Chart 14906.—At a distance of 10¾ miles from Little Sable Point or about 9¼ miles from White Lake are Clay Banks, 245 feet high, and there are many other hills and bluffs rising from 125 feet to 225 feet.

Charts 14906, 14935.—Sewer Outfall.—A 24-inch-diameter sewer outfall pipeline of the E. I. DuPont Co., completed in 1956, commences at a point on the shoreline, 6,700 feet 351° from White River North Pierhead Light and extends 1,500 feet 270° to a crib with 14 feet over it. It is not marked.

Caution Area.—Ninth Naval District Naval Reserve training ships conduct surface to surface firing during maneuvers in Lake Michigan between Little Sable Point and Muskegon, Michigan. The firing area is bounded as follows: 43°20′00″ N., 86°38′00″ W.; 43°17′00″ N., 86°51′00″ W.; 43°29′00″ N., 86°56′00″ W.; 43°32′00″ N., 86°43′00″ W. Mariners are advised to consult U.S. Coast Guard Ninth District Notices to Mariners for schedule of operations and instructions.

White Lake Harbor, Mich.—This harbor is located in White Lake, the westerly end of which is close to the shore line of Lake Michigan and connected with the latter by a dredged cut, which is about 13¼ miles south-southeast of Stony Creek. The cities of **Whitehall** and **Montague** front the northeasterly head of White Lake about 4 miles from the entrance.

Channels.—The dredged entrance channel leads from deep water in Lake Michigan between parallel piers and revetments to the west end of White Lake. The outer end of the channel between the piers is subject to extensive shoaling. In May 1978, the channel had a controlling depth of 11 feet. Currents in the channel attain velocities of up to 3 m.p.h. in either direction.

Mooring to the piers and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Aids to Navigation.—White Lake North Pierhead Light 1 is on the outer end of the north pier at the harbor entrance. White Lake South Pierhead Light 2 is on the outer end of the south pier at the harbor entrance. White Lake Pierhead Inner Light 4 is located on the inner end of the south pier.

In White Lake immediately after leaving the entrance channel, the line of best water bends to the southeast around a shoal projecting southeasterly from Indian Point and marked by a buoy. A similar buoy marks the south edge of the shoal extending off Long Point, on the north shore about 1¼ miles easterly from the entrance channel. The lake is about 5 miles long, from ¼ to 1¼ miles wide, and has depths of 25 to 72 feet.

Harbor Facilities.—Anchorage is good; mooring facilities for small craft including two new marinas and docks with complete accommodations exist at Whitehall and Montague near the head of the lake. There are several docks with limited accommodations at the marina near Maple Grove and at the yacht club and marina on the south side of the lake near the westerly end. Practically all types of service are available including a marine railway and boat hoists. Gasoline is available from dockside pumps. The Hooker Chemical Corp. dock is located on the easterly side of Dowies Point. No bridges exist over the lake.

In the head of White Lake at the mouth of **White River** there is a sand bar on which the depth is only 2 feet.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

Chart 14906.—The shore line of Lake Michigan continues in a southeasterly direction from White Lake 11¼ miles to Muskegon, and consists of low sand bluffs and some wooded hills; it is clear of shallow water to within ⅝ mile. **Duck Lake**, about 1 mile long and situated near shore about 2½ miles southeast of the White Lake entrance piers, has no navigable connection to Lake Michigan.

Charts 14906, 14934.—Muskegon Harbor, Mich.—This harbor is formed by **Muskegon Lake** and an improved and protected entrance channel which connects it to Lake Michigan. It is located about 80 miles easterly, across the lake, from Milwaukee Harbor. Muskegon Lake, with its westerly end less than a mile from Lake Michigan, has a length of about 4 miles, ranges in width from 2 miles at its westerly end to ⅝ mile near its mid-length, and has depths in excess of 29 feet over most of its area reaching a maximum depth of 79 feet. A shoal extending south from the northerly shore, and a shoal border along the southerly shore of the lake, narrow the deep water to about 2,000 feet near mid-lake. There are many obstructions in the shallow parts of the lake including cribs, pipelines, submerged dock ruins and pilings. The anchorage is good. Facilities for a wide range of commerce are located along the south shore of the lake at Muskegon and at its easterly end. Car-ferry steamers ply between this port and Milwaukee Harbor throughout the year. A lighted stack of the Consumers Power Co. at the mouth of the Muskegon River is prominent from lakeward.

Channels.—The dredged entrance channel leads from deep water in Lake Michigan between converging breakwaters to an outer basin, thence between piers and revetments to Muskegon Lake. In June 1978, the controlling depths were 29 feet in the approach channel except for shoaling along the edges, thence 28 feet through the outer harbor, thence 27 feet between the piers and revetments to Muskegon Lake except for minor shoaling along the channel limits.

Currents in the channel attain velocities up to 3 m.p.h. in either direction.

The outer basin is not adapted for anchorage of vessels, but reduces wave action in the entrance channel.

Mooring to the breakwaters, piers, and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Aids to Navigation.—Muskegon South Breakwater

Light, 70 feet above the water on a red pyramidal tower, is on the outer end of the south breakwater and an air diaphragm horn is sounded when required. North Breakwater Light, 53 feet above the water on a white skeleton tower, is on the outer end of the north breakwater. Muskegon South Pierhead Light, 50 feet above the water on a red conical tower, is on the outer end of the south pier and forms a range with the Muskegon South Breakwater Light; which is 1,815 feet 060°. A diaphragm horn short range fog signal and radio beacon are operated at this light.

North Pier Outer Light, at the outer end of the north pier, and North Pier Inner Light, at the inner end of the north revetment, are 20 feet above the lake on white columns.

Muskegon Lake Light, 24 feet above the water on a red skeleton tower, is on the south revetment at the elbow near its easterly end; a diaphragm fog horn sounds at this light.

Bank Point Light, 24 feet above the water on a black skeleton tower which is mounted on a concrete pier, is at the south point of an extensive shoal area which reaches about ¾ mile from the north shore of Muskegon Lake at about its midpoint. Riprap extends out about 28 feet from the light structure and should not be passed close aboard even by vessels of shallow draft.

Hartshorn Light, marking the northerly point of a shoal along the south shore of Muskegon Lake, is located about ¾ mile northeast of Bank Point Light. It is 15 feet above the lake on a red column. Riprap extends out about 5 feet from the base of the light.

In addition to the above lights which are maintained by the U.S. Coast Guard, there are numerous other lights marking privately maintained docks and channels.

Harbor Facilities.—Public docking facilities are available at the Hartshorn Municipal Marina, jointly constructed by the city and the Michigan Waterways Commission. Gasoline, water, electricity, launching ramp, pump-out facilities, and harbormaster services are available. A marina on the north shore, at the outlet of Bear Lake, offers limited transient berthing, gasoline, water, electricity, 30-ton mobile hoist, open and covered dry winter storage, limited marine supplies, pump-out service, engine repairs, and limited hull and electronic repairs.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Muskegon, Mich., is contained in the Port Series No. 48 (Revised 1973), published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Coast Guard Station.—Muskegon Coast Guard Station is on the south side of the harbor entrance channel. Coast Guard Group, Muskegon, is 1,800 feet northeast of the station.

Water Intake.—The Teledyne Continental Motors Corp. intake crib, with 11 feet of water over it, is marked by a privately maintained buoy in 11 feet of water located approximately 2,950 feet 185° from the outer light of the Consumers Power Co.

Anchorage Regulations.—See 33 CFR § 110.1 and § 110.81 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

The Muskegon River, above Muskegon Lake, has a length of about 33 miles to the site of the former dam at Newaygo. This dam was removed in 1969. For a distance of about 24 miles below Newaygo the average width is about 230 feet, with depths varying from 3½ to 9 feet at a stage of about 2 feet above extreme low water. For the remaining 9 miles the main branch of the river varies in width from about 80 to 230 feet, averaging about 130 feet, and is from 2½ to 9 feet deep at a stage of about 2 feet above extreme low water. The Muskegon River above Muskegon Lake is navigable only for small boats which are able to pass under the bridges. The least clearance is 5 feet for both channels.

Wreck.—In 1970, the wreck of the Altahama in the northeast end of Muskegon Lake and just southwest of the mouth of the Muskegon River (North Channel) was removed to a minimum depth of 12 feet. Extending along the lake bottom from the hull remains in a northwesterly direction to the shore are the following abandoned items: a telephone cable, a power cable, a 4-inch pipeline, two 6-inch pipelines and a 10-inch pipeline. The pipelines were purged, water flooded, and capped and are evident only on the lake bottom. The submerged ruins of a former dock facility are also located about midway betweeen the hull remains and the shore to the northwest.

Bear Lake is about 2 miles long, about ½ mile wide, and parallels the northeast arm of Muskegon Lake on the northwest side. The community of North Muskegon is on the peninsula formed by these two bodies of water. The outflow from this lake into Muskegon Lake is through the west part of the shoal at mid-point in Muskegon Lake marked by Bank Point Light.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 61, Muskegon county. R 281.761.2. Channel from Bear lake to Muskegon lake.

2. On the waters of Bear lake channel from its head at Bear lake to its mouth at Muskegon lake, a distance of approximately 2,250 feet, * * *

Chart 14906.—From Muskegon, the coast runs in a southeasterly direction to Grand Haven, about 12 miles distant, with deep water ½ mile out. In the 4¾ miles between Muskegon and Mona Lake, a range of hills attains a maximum elevation of 205 feet; the remainder of the stretch to Grand Haven is lower.

Mona Lake, Mich., a small body of water 4¾ miles south of Muskegon piers, is the location of several summer resorts and cottages and is used by small recreational craft. It is 3⅝ miles long east and west, from 425 to 3,300 feet wide, and generally 18 to 40 feet deep. At the western end is an outlet into Lake Michigan through a slightly winding channel 2,200 feet long and from 60 to 130 feet wide; the entrance is at times entirely closed by sand bars. A controlling depth of 3 feet was found in the channel in August 1971. Two piers were formerly maintained by lumbering interests. The north pier is almost entirely

washed away, and the south pier is gone except for a double row of piles extending from a point 50 feet out in the lake to a point about 450 feet inside. The banks rise steeply from each shore.

A steel girder highway bridge crosses the upper end of the outlet, having a draw span 80 feet long over all; the north draw is over the channel, with clear width of 29.3 feet and clear height of 12.1 feet above Low Water Datum. In 1978, it was reported that the bridge was being maintained in the closed position. A fixed-span bridge crosses the lake 1½ miles farther east, with clear width between piers of 61.3 feet and clear height of 18.8 feet above Low Water Datum.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 61, Muskegon county. R 281.761.1. Mona lake.

1. On the waters of Mona lake, Norton township, county of Muskegon, state of Michigan:

(a) Boats shall be operated at a slow, no wake speed through the channel extending from the Lake Harbor Road bridge to Lake Michigan.

(b) No operator of any motorboat shall operate his craft in the area from the northeastern abutment of the Lake Harbor Road bridge due east 100 feet, thence northeastward at a distance of 100 feet from and parallel to the north shore of Mona lake for a distance of 1,025 feet, thence 000 degrees true to the northwestern shoreline of Mona Lake.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The city of Muskegon Heights water intake crib with 37 feet of water over it, is located 3¼ miles 161° from Muskegon South Breakwater Light and about 4,600 feet off the shore.

The city of Muskegon water intake crib located 6,100 feet 182° from the Muskegon South Breakwater Light and about 5,600 feet offshore has a least depth of 31 feet. A second crib located 4,900 feet 152° from the light and 2,600 feet from shore is used only in an emergency. An abandoned Muskegon City water intake crib, with 38 feet of water over it, is located 1⅜ miles 189° from the light and about 7,000 feet offshore.

Charts 14906, 14933.—Grand Haven Harbor and Grand River, Mich.—This harbor is comprised of the mouth and lower portion of the Grand River and is about 83 miles easterly across the lake from Milwaukee Harbor. The City of Grand Haven fronts on both sides of the lower mile of the Grand River and on the southerly side along the next four miles upstream. Ferrysburg fronts on the northerly shore about 3 miles above the river mouth. The Village of Spring Lake has frontage along the river for about 1½ miles above the outlet to Spring Lake. The improvement consists of piers and revetments at the entrance and a channel extending up the river to the mouth of Bass River. These communities are not visible from Lake Michigan because of sand dunes and hills immediately north and south of the entrance.

The Grand River above the mouth of Bass River is not maintained. Present conditions are not known, but controlling depths at extreme low water probably do not exceed from 2 to 3 feet up to Grand Rapids, a further distance beyond the Bass River, of approximately 23½ miles, the former head of government improvement. The natural width varies from 300 to 1,000 feet. Only small recreational craft operate on this section.

High-water periods on Grand River are generally in the spring and continue for about 2 months, with currents up to 3 to 5 miles per hour. The lower portion of the river has connecting shallow side channels separated from the main channel by low, marshy islands and several bays, called bayous, with deep water and generally shallow entrances.

The South Channel, the farthest downstream of the side channels, cuts across a bend in the main channel between points about 1½ and 3½ miles above the harbor entrance and has a controlling depth of 3 feet.

Spring Lake, connecting with Grand River at Ferrysburg, is about 4½ miles long and 700 to 2,000 feet wide, with general depths of from 20 to 42 feet, reducing at the head to about 6 feet at the dock at Fruitport.

The average season of navigation on the river above the harbor is from April 1 to December 1.

Channels.—The dredged entrance channel leads eastward from deep water in Lake Michigan between parallel piers at the mouth of Grand River and upstream for about 16 miles. There is a turning basin on the south side of the channel 2.3 miles above the mouth, and 2.7 miles above the mouth a side channel extends northward to the deep water in Spring Lake. In March 1978, the controlling depths were 22 feet through the approach channel to inside the piers except for shoaling to 18 feet along the north flared edge, thence 21 feet at midchannel to the railroad bridge at Ferrysburg, thence 15 feet in the turning basin, thence 15 feet from the railroad bridge into Spring Lake, thence in 1977, 5 feet from the Spring Lake channel to the C-Way Construction Co. gravel pits at Bass River except for shoaling to 4 feet from 600 feet below the gravel pit entrance. The channels are subject to shoaling.

Currents in the river attain velocities up to 3 m.p.h.

Large riprap stones have been placed along the lakesides and ends of the piers, and navigation should not be attempted close to these structures.

Aids to Navigation.—Grand Haven South Pierhead Entrance Light is located 42 feet above the lake on the gable end of the fog-signal building about 45 feet from the outer end of the south pier; an air fog diaphragm and a marker radiobeacon are operated at this station. The South Pierhead Inner Light, 52 feet above the lake on a red cylindrical tower, is located 600 feet 081°08′ from the entrance light. North Pierhead Light 1, 36 feet above the water on a white skeleton tower, is located near the outer end of the north pier. The 6-foot contour in the river is buoyed from Ferrysburg to Mile 17 just below the mouth of the Bass River.

Harbor Facilities.—The harbor channel is not adapted for anchorage of vessels, and mooring to the piers or revetments is prohibited. The harbor affords only such mooring facilities as are available at public or private wharves. Several privately owned basins for small craft are in the

various water areas. A marina on Harbor Island, about 800 feet upstream of the Grand Haven-Ferrysburg bridge, has gasoline, launching ramp, 40-ton mobile hoist, limited marine supplies, pump-out services, and complete hull and engine repairs. Diesel fuel can be obtained from the boatel 1,300 feet northeast of the marina.

In 1969, the city of Grand Haven and the Michigan Waterways Commission completed construction of marina facilities along the easterly shore of the Grand River, immediately downstream from the mouth of the South Channel and public launching ramps along the southerly shore of the river about 1,800 feet downstream from the turning basin. These facilities include water, electricity, lights, gasoline and oil, restrooms, showers, sewage pump-out facilities, and harbor attendant services.

Disposal Area.—Harbor Island. An irregularly shaped dredging disposal area has been constructed on Harbor Island parallel to and west of the Grand Trunk Western RR. The area extends south from the turning basin for approximately 1,600 feet. The width varies from 1,300 feet on the north edge to 500 feet on the south edge.

Coast Guard Station.—Grand Haven Coast Guard Station is located on the north side of the harbor entrance channel.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. Three potable water intake structures, offshore of Grand Haven State Park, are located at 300 feet, 900 feet and 1,400 feet, respectively, from the south pier. They are above water and not marked.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding, and 33 CFR § 117.685 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

Local Harbor Regulations are under the control of the city manager and enforced by the harbormaster. Copies of the regulations can be obtained from the City Manager, City Hall, 519 Washington Street, Grand Haven, Michigan 49417.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 70, Ottawa county.

Sec. 2-702A Speed; regulation thereof.—(1) On the waters of the Grand River and entrance channel, sections 19, 20, 29, 30, Town 8 North, Range 16 West, city of Grand Haven, Ottawa County from the entrance channel pierhead upstream to a line drawn from the north shore of South channel, at its confluence with the Grand River, it is unlawful for the operator of a motor vessel to exceed a slow-no wake speed.

(2) On the waters of South channel, sections 20 and 21, Town 8 North, Range 16 West, City of Grand Haven, Ottawa County, it is unlawful for the operator of a vessel to exceed a slow-no wake speed.

(3) On the waters of the Grand River, Sections 16, 17, 20, and 21, Town 8 North, Range 16 West, City of Grand Haven, Ottawa County, from the Grand Trunk railway bridge downstream for 3,200 feet and upstream for 1,000 feet, it is unlawful for the operator of a vessel to exceed a slow-no wake speed.

(4) On the waters of the Grand River, Sections 16 and 21, Town 8 North, Range 16 West, City of Grand Haven, Ottawa County, from buoy No. 14, which lies 600 feet more or less upstream from U.S. 31 highway bridge, westerly to the west shore, and along the westerly shore to the entrance of South channel and when within 300 feet of the shoreline, it is unlawful for the operator of a vessel to exceed a slow-no wake speed.

THE VILLAGE COUNCIL FOR THE VILLAGE OF SPRING LAKE, COUNTY OF OTTAWA AND STATE OF MICHIGAN, ORDAINS:

Section 2. On the waters of Spring Lake adjacent to the Village of Spring Lake, it is unlawful for:

(a) The operator of a vessel less than twenty-six (26) feet in length to exceed a slow-no wake speed when within two hundred (200) feet of any shore, dock, or pierhead.

(b) The operator of a vessel twenty-six (26) feet or more in length to exceed a slow-no wake speed.

R 281.770.9. Spring Lake; slow—no wake speed.

Rule 9. On the waters of Spring Lake adjacent to the City of Ferrysburg, Village of Spring Lake, Spring Lake Township, Ottawa County, it is unlawful for:

(a) The operator of a vessel less than 26 feet in length to exceed a slow-no wake speed when within 200 feet of any shore, dock, or pierhead.

(b) The operator of a vessel 26 feet or more in length to exceed a slow-no wake speed.

R 281.770.10. Spring lake and connected waters; slow—no wake speed.

10. (1) It is unlawful for the operator of a vessel to exceed a slow—no wake speed on the following described waters in the city of Ferrysburg, village of Spring lake and township of Spring lake, county of Ottawa.

(a) *Smith bayou.*—On the waters of Smith bayou, sections 9, 15 and 16, town 8 north, range 16 west, city of Ferrysburg, county of Ottawa, northwesterly of a line beginning where the centerline of Reenders street as extended intersects the water's edge and thence southwesterly to the nearest opposite shore.

(b) *Hammond bayou.*—On the waters of Hammond bayou, sections 11 and 14, town 8 north, range 16 west, township of Spring lake, county of Ottawa, easterly of a line beginning where the east line of lot 20, plat of longview, intersects the water's edge and thence southerly to the nearest opposite shore.

(c) *Cornelius bayou.*—On the waters of Cornelius bayou, sections 2 and 3, town 8 north, range 16 west, township of Spring lake, county of Ottawa, west of a line beginning where the west line of lot 24, Belle Point subdivision intersects the water's edge and thence southwesterly to the nearest opposite shore.

(d) *Stahl bayou.*—On the waters of Stahl bayou, section 2, town 8 north, range 16 west, township of Spring lake, county of Ottawa, north of a line from the eastern-

Structures Across the Grand River From Mouth to Grand Rapids

No.	Location and name	Kind	Miles above South Pierhead Entrance Light	Draw or span openings—clear width in feet Proceeding Upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Main Channel								
0	Submerged cable	Telephone	0.25						On channel bottom.
1	do	Telephone	0.48						Approx. depth 32 ft.
1A	Submerged cable (15,000 volt).	Electric	1.00						City of Gd. Haven. Approx. depth 32 feet.
1B	Submerged pipeline (20 inch)	Water	1.00						Do.
	Main and South Channels	Junction	1.38						
2	Submerged pipelines (2)	Petroleum	2.78						8-inch lines. About 5 ft. apart. Approx. depth 31 ft.
3	GTW RR. bridge	Railway	2.80	60.8	61.1		9.8	5.6	Swing. See Note 1.**
4	Submerged cable	Electric	2.80						Approx. depth 23 ft.
5	Submerged cables	do	2.81						4 cables. Approx. depth 31 ft. Wolverine Elect. Coop.
6	Grand Haven - Ferrysburg (Route No. 31) bridge.	Highway	2.87			155	25.0	21.2	Bascule.**
6A	Submerged cable	Telephone	2.88						Michigan Bell Telephone. Approx. depth 28 feet.
7	Submerged pipeline	Gas	2.96						Approx. depth 25 ft.
8	Aerial cable	Electric	2.96				127.8	121.6	Board of Light and Power, Grand Haven.
9	do	do	2.98				133.2	127.0	City of Grand Haven.
10	Submerged cable	Telephone	2.98						Approx. depth 25 ft.
	Main Channel and mouth of Spring Lake	Junction	3.04						
11	Submerged 6-inch pipeline	Gas	4.00						Mich. Gas Utilities. Approx. depth unknown.
11A	Submerged pipeline	Intake	4.07						
11B	do	do	4.20						
12	Aerial cable	Electric	6.45				88.0	80.9	
12A	Submerged pipeline	Gas	12.40						Mich. Gas Utilities. 4" line. Approx. depth 17 ft.
13	Submerged pipeline	Oil	12.50						Approx. depth 14 ft.
14	Aerial cable	Electric	12.60				90.0	81.0	
	Main Channel and mouth of Bass River	Junction	17.38						
15	Aerial cable	Electric	17.40				53.0	35.8	O & A Electric Cooperative.
16	do	do	19.39				74.0	61.0	Southern Michigan Light & Power Co.
17	68th Avenue bridge	Highway	19.40	76.5	76.5	76.5	22.1		Fixed. Compl. 1969.
18	Submerged cable	Telephone	23.50						Approx. depth 7.1 ft.

See footnote at end of table.

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Structures Across the Grand River From Mouth to Grand Rapids—Continued

No.	Location and name	Kind	Miles above South Pierhead Entrance Light	Draw or span openings—clear width in feet Proceeding Upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Junction of Main Channel and Mouth of Bass River—Con.								
19	Bridge Street Road bridge	Highway	25.20	85.0	85.0	------	19.5	1.11	Fixed. No lights.
20	Aerial cable	Electric	25.21	------	------	------	39.4	21.0	Consumers Power Co.
21	Grandville bridge	Highway	33.90	69.6	69.6	------	24.2	9.5	Fixed. No lights.
23	Aerial cable	Electric	37.20	------	------	------	43.0	22.5	Consumers Power Co.
24	Penn Cent. (N YC RR) bridge	Railway	37.20	------	54.0	------	17.0	−3.5	Swing. No lights.**
25	Aerial cable	Electric	39.22	------	------	------	40.0	19.5	Consumers Power Co.
26	do	do	39.26	------	------	------	50.0	29.5	Do.
27	do	do	39.31	------	------	------	80.0	59.5	Do.
28	do	do	39.33	------	------	------	40.0	19.5	Do.
29	do	do	39.36	------	------	------	80.0	59.5	Do.
30	do	do	39.48	------	------	------	80.0	59.5	Do.
31	do	do	39.50	------	------	------	70.0	49.5	Michigan Railway Co.
32	Mich. Ry. (Electric) bridge	Railway	39.50	70.0	†70.0	------	27.0	7.5	Swing. No lights.**
33	Aerial cable	Electric	39.52	------	------	------	70.0	49.5	Consumers Power Co.
34	do	do	39.79	------	------	------	59.0	38.5	Do.
35	Submerged cable	Telephone	39.80	------	------	------	------	------	Approx. depth 8 ft.
36	Wealthy Street bridge	Highway	39.80	------	70.0	------	19.3	−3.2	Swing. No lights.**
37	Ches. & Ohio Ry bridge	Railway	39.90	------	70.0	------	19.2	−3.3	Do.
38	Fulton St. bridge	Highway	40.00	------	------	------	------	------	Head of Navigation.
	South Channel Junction—Main Channel	------	1.38						
39	Third Street bridge	Highway	1.80	------	------	------	9.6	0.9	Fixed. No lights.
41	GTW RR bridge	do	1.99	------	------	------	9.8	5.8	
42	Aerial cable	Electric	2.23	------	------	------	47.1	42.0	Bd. of Public Works, Grand Haven.
43	Grand Haven-Ferrysburg (Route No. 31) bridge.	Highway	2.24	------	------	------	17.4	13.4	Fixed.
44	Submerged cable	Telephone	2.25	------	------	------	------	------	Approx. depth 3 ft.
	Junction—Main Channel	------	2.90						
	Spring Lake Junction—Main Channel	------	3.04						
45	Spring Lake-Ferrysburg Route No. 104 bridge.	Highway	3.12	------	------	111.0	35.0	31.0	Fixed.
47	Submerged cable	Telephone	3.17	------	------	------	------	------	Approx. depth 18 ft.
48	Aerial cable	Electric	3.18	------	------	------	109.1	------	Consumers Power Co.
49	Submerged cable	do	3.20	------	------	------	------	------	Approx. depth 18 ft.
50	GTW RR bridge	Railway	3.21	59.0	------	------	7.7	------	Swing. See Note 2.**

†Opening not available for use.

**Whistle Signals for Opening Draws: No. 3, 1 blast (–); No. 6, 1 long blast followed by 1 short blast (— –); Nos. 17, 24, 32, 36, 37, 3 blasts(– – –); No. 50, 2 blasts (– –).

NOTE 1.—Red light on each end of center pier and on each end of draw pier; 2 compound red-and-green lights on drawspan (at each end) show red up and down stream when bridge is closed and green when open.

NOTE 2.—Red light on piling on each side of opening; red light shows in center when open; 3 red-and-green lights on draw (at center and each end) show red up and down stream when bridge is closed and green when open.

most point of lot 7, Belle Point subdivision northeasterly to the nearest opposite shore.

Chart 14906.—The land for the 11¼ miles from Grand Haven to Port Sheldon has a trend slightly east of south and is partially wooded over rolling terrain, with a number of hills having 140 to 200 feet elevation, principally in the area just to the south of Grand Haven. The shallows through this reach are less than ½ mile wide.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 CFR § 1250.93 of Rules and Regulations, preceding. The submerged water intake crib of the City of Grand Rapids is located about 6,000 feet from the shore at a point about 6 miles southerly from Grand Haven Harbor entrance. Depth of water over the crib is 41 feet and it is not marked.

Port Sheldon, Mich.—This harbor on Pigeon Lake which is 4,000 feet long with maximum width of 1,200 feet and depth of 25 feet, was made accessible by the improvement of the entrance channel and the construction of protective piers by the Consumers Power Co. The primary purpose of the channel is to provide cooling water for the nearby power plant. Mariners entering the harbor do so at their own risk and are requested not to dispose of waste in Pigeon Lake. Land along south shore of Pigeon Lake is privately owned and the north shore is Consumers Power Company property. There are no public facilities available to the boaters at Port Sheldon.

Aids to Navigation.—The outer end of each breakwater is marked with a light.

The white stack of Consumers Power Co. on the intake channel north of Pigeon Lake is a prominent landmark.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 70, Ottawa county. R 281.770.16. Pigeon lake; slow—no wake speed.

16. On the waters of Pigeon lake, section 15 and 16, town 6 north, range 16 west, Port Sheldon township, Ottawa county, * * *

Chart 14906.—From Port Sheldon to the Holland Harbor entrance, a distance of 8¾ miles, the shoreline trend is southerly with sand bluffs close along shore.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 CFR § 1250.93 of Rules and Regulations, preceding. A submerged pipeline and water intake cribs for the city of Wyoming are located about 3½ miles south of Port Sheldon entrance and 4,400 feet offshore in about 30 feet of water with a clear depth of 29 feet.

A submerged water intake crib of the city of Holland is connected to shore by an intake pipe and is located 1.8 miles north of Holland entrance piers. The crib is 4,750 feet from shore in about 40 feet of water, and has a clear depth of 31 feet over it.

Charts 14906, 14932.—**Holland Harbor, Mich.**—This harbor is formed by **Lake Macatawa**, a protected and improved entrance channel which connects its westerly end to Lake Michigan, and the mouth of the **Macatawa River** which flows into its easterly end. The harbor entrance is 88 miles 101° from Milwaukee Harbor and about 95 miles northeasterly of Chicago Harbor. Lake Macatawa has a roughly east-west length of 5 miles and widths ranging from 1,000 feet off Superior Point near its mid-length to over a mile in Big Bay and Pine Creek Bay which are indentations in the north shore to the east and west of the point. The city of Holland, Michigan, fronts on much of the southerly side and the east end of the lake. The resort community of Macatawa fronts the southwestern part of the lake near the outlet to Lake Michigan. The dredged channel in the Macatawa River has been revetted along its easterly side for a length of about 1,700 feet for the mooring of vessels.

Channels.—The dredged entrance channel leads from deep water in Lake Michigan between converging breakwaters and through a revetted channel to Lake Macatawa. The channel, well marked by buoys, continues across the lake to a turning basin off Holland at the east end of the lake. From the northeast side of the basin, the channel leads into the mouth of Macatawa River.

In 1977, the controlling depths were 23 feet in the approach channel, thence 21 feet at midchannel through the outer basin, thence 21 feet to Lake Macatawa, thence 20 feet on the centerline through the lake to the turning basin, thence 18 feet through the turning basin except for shoaling along the edges, thence 14 feet to the upstream limit of the project inside the mouth of Macatawa River.

A dredged settling basin extends 700 feet upstream from the upper limit of the project in Macatawa River. In 1977, the basin had depths of 9 to 14 feet in the lower half and 2 to 12 feet in the upper half.

The currents in the entrance channel attain velocities up to 3 m.p.h. in either direction. Mooring to the breakwaters and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Disposal areas.—Dredging disposal areas are in the Macatawa River from about 0.5 mile above the settling basin to Windmill Island.

Aids to Navigation.—Holland Harbor South Breakwater Light is near the outer end of the south breakwater, 45 feet above the lake on a skeleton tower. The South Pierhead Light is located near the outer end of the south pier, 52 feet above the lake on a red square tower about 885 feet 086½° from the South Breakwater Light. North Breakwater Light is near the outer end of the north breakwater, 45 feet above the lake on a white skeleton tower; diaphragm foghorn sounds. The North Pierhead Light is located near the outer end of the north pier, 25 feet above the water on a white column. Lake Macatawa Light marks the inner end of the south pier at the entrance to Lake Macatawa and is 24 feet above the water on a white column.

Three lights, each 23 feet above the water on a white column, mark the extremities of shoals in Lake Macatawa as follows: Middle Ground Light 3 marks the south edge of the bank extending to within ¼ mile of the south shore. Drake Point Light 4 marks the north point of the shoal extending from the south shore about 1,500 feet easterly

Structures Across Lake Macatawa From Mouth to Black River

No.	Location and name	Kind	Miles above South Breakwater Light	Draw or span openings—clear width in feet			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Lake Macatawa								
1	Submerged pipeline	Water	0.50						Approx. depth 36 feet.
2	Submerged cable	Telephone	2.75						Approx. depth 32 feet.
3	do	do	2.80						Do.
4	Submerged pipeline	Petroleum	4.30						Depth 30 feet.
	Junction of Lake Macatawa and Black River.		5.55						

from the Middle Ground Light, the deep channel passing between the two lights. Point Superior Light 7 marks the south edge of the shoal extending from Superior Point. Riprap extends horizontally out from these lights to the following extents and they should not be passed extremely close aboard, even by vessels of shallow draft: Middle Ground Light, surrounded to 24 feet; Drake Point Light, surrounded to 40 feet; Point Superior Light, surrounded to 15 feet.

Harbor Facilities.—The commercial harbor is along the city front of Holland, at the easterly end of the lake about 5½ miles from the entrance. Mooring facilities also exist along the southerly side of the turning basin and at a few pierheads on the south side of the lake. There are many yacht clubs, parks, public ramps, and marinas throughout the entire lake area. There are repair facilities with gasoline and diesel fuel available at several places. The largest available hoist is on the west shore of Big Bay, and is capable of handling vessels up to 60 tons. The anchorage in the lake is relatively good. There are no bridges in the harbor.

Coast Guard Station.—Holland Coast Guard Station is located on the north side of Lake Macatawa near the harbor entrance.

Anchorage Regulations.—See 33 CFR § 110.1 and § 110.-80a of Rules and Regulations, preceding.

Marina located on the northwest shore of Big Bay.

Anchorage Regulations.—See 33 CFR § 110.1 and § 110.-80a of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceeding. Regulation No. 70, Ottawa county.

R 281.770.13. Lake Macatawa, Central park; slow—no wake speed.

13. On the waters of lake Macatawa, city of Holland and township of Park, county of Ottawa, east of a line beginning where Grove avenue as extended intersects the water's edge and thence north to the nearest opposite shore, to a line beginning where Myrtle avenue as extended intersects the water's edge, and thence north to the nearest opposite shore, it is unlawful for:

(a) The operator of a vessel less than 26 feet in length to exceed a slow—no wake speed when within 200 feet of any shore, dock or pierhead.

(b) The operator of a vessel 26 feet or more in length to exceed a slow—no wake speed when within 600 feet of any shore, dock or pierhead.

R 281.770.14. Lake Macatawa, Kollen park; slow—no wake speed.

14. On the waters of lake Macatawa, city of Holland and township of Park, county of Ottawa, east of a line beginning where Cleveland avenue as extended meets the water's edge, and thence north to the nearest opposite shore, to a line beginning where Washington boulevard as extended intersects the water's edge and thence north to the nearest opposite shore, it is unlawful for:

(a) The operator of a vessel less than 26 feet in length to exceed a slow—no wake speed when within 200 feet of any shore, dock or pierhead.

(b) The operator of a vessel 26 feet or more in length to exceed a slow—no wake speed when within 600 feet of any shore, dock or pierhead.

R 281.770.15. Macatawa river, city of Holland; slow—no wake speed.

15. On the waters of the Macatawa river, city of Holland, county of Ottawa, from a line from where Fourth street as extended west intersects the water's edge and thence northeasterly to the nearest north shore, upstream to a point 1500 feet upstream from the North River Avenue bridge, * * *

NOTE.—The regulations noted are also published as a park Township ordinance under effective date of 18 November 1966, and are the only regulations now in force pertaining to Lake Macatawa, Ottawa County, Holland, Michigan. Under the provisions of the park Township Ordinance, the following is a part of their ordinance:

"Violations of the provisions of this Ordinance shall be

punishable by fine of not more than $100.00 for such offense or imprisonment in the County Jail for a period not to exceed ninety (90) days, or both said fine and imprisonment."

Coast Chart 14906.—The Lake Michigan coast from the Lake Macatawa entrance to the **Kalamazoo River** entrance, a distance of about 7 miles, is bordered by low bluffs and occasional hills from 100 to 250 feet in height, and has deep water to within ½ mile.

Sunken Barge.—In 1972, a 20 by 40-foot barge was sunk about 0.6 mile offshore in 35 feet of water approximately 3.8 miles south of Holland, Michigan. The barge has a 20-foot crane mounted on board. Clearance over the barge and crane are not known.

Saugatuck Harbor, Mich.—This harbor, about 90 miles northeasterly of Chicago Harbor and 89 miles southeasterly of Milwaukee Harbor, is formed by the lower portion of the Kalamazoo River and a dredged and protected entrance channel. The present entrance is located about 3,700 feet north of the natural mouth and by-passes a mile of the natural river leaving an t-shaped pond not connected with the lake or river and known locally as Ox Bow Lake.

Submerged pilings of the old piers at the former entrance of the river extend into the lake about 200 feet and are marked by a buoy. Navigation should not be attempted close to these structures.

A radar dome on Bald Head Peak, about a mile south of the entrance, is a very prominent landmark.

For the first 2 miles above the present entrance, the width of Kalamazoo River varies from 200 to 500 feet. In the next ¾ mile, the river expands to a width of about 2,000 feet and again narrows to 500 feet. This wire portion of the river is known as **Kalamazoo Lake**. The village of Saugatuck is located along the easterly shore of Kalamazoo Lake and along the east and west sides of the river below the lake. The village of **Douglas** is on the opposite side of the lake. A channel, 70 feet wide and 8 feet deep was dredged through the upper part of Kalamazoo Lake in 1965, but in 1978, only a meandering channel remained. The channel extends 2,710 feet northwesterly from the downstream side of the old U.S. 31 Highway bridge. A highway bridge crossing the river just above the lake connects the towns and is the first structure across the river above its mouth.

Channels.—The dredged entrance channel leads from deep water in Lake Michigan between parallel piers and revetments through the mouth of Kalamazoo River and thence upstream for about 2.1 miles to Saugatuck at the north end of Kalamazoo Lake.

In August 1978, the midchannel controlling depth was 9 feet through the approach channel and between the piers and revetments, thence 11 feet at midchannel upstream to Saugatuck. The channel between the piers and revetments must be dredged frequently, as it tends to shoal after storms. Currents in the channel attain velocities up to 3 m.p.h. in either direction.

Aids to Navigation.—Saugatuck South Pierhead Light, 31 feet above the water on a white square column, is located near the outer end of the south pier; a diaphragm fog horn operates continuously at the light. **Saugatuck** North Pierhead Light, 25 feet above the water on a white column, is located near the outer end of the north pier. The channel in the Kalamazoo River from the entrance to Kalamazoo Lake and the channel through the shallows of Kalamazoo Lake are marked by unlighted buoys.

Ferry Operations.—A ferry boat crossing the Kalamazoo River at Mary Street in Saugatuck, Michigan, is propelled by hauling on a submerged chain (reestablished in 1965). Watercraft, to prevent fouling the chain working around a hand capstan on the ferry, when meeting the ferry boat, should avoid operating within 30 feet of the bow or stern of the ferry. Passage on its stern is preferred.

Harbor Facilities.—No anchorage space is available and mooring to the piers and revetments is prohibited. The inner harbor affords only such mooring facilities as are available at private wharves.

Kalamazoo River above Saugatuck.—From Saugatuck to Calkins, about 24 miles above, the river is from 100 to 150 feet wide and affords, at low water, a narrow and crooked channel for boats drawing not more than 2½ feet. The Allegan Dam at Calkins, does not have a lock and boats must be portaged around it. The pool above the dam extends to Allegan and has a controlling depth of about 5 feet.

Gasoline, food, dockage, winter storage, and major repair facilities are available for craft up to 60 feet in length at Saugatuck, in Kalamazoo Lake and at Douglas.

Navigation Regulations.—See CFR § 162.120 in Rules and Regulations, preceding.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 3. Allegan county.

R 281.703.1. Kalamazoo river, Saugatuck township.

1. On the waters of the Kalamazoo river, located in Saugatuck township, Allegan county, state of Michigan, extending from the entrance piers of Lake Michigan, southerly to a line extending westward from the south side of Mason Street, village of Saugatuck, across the Kalamazoo river, * * *

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding. Regulation No. 3. Allegan county.

R 281.703.2. Saugatuck harbor.

2. All watercraft, other than vessels whose lighting requirements are presently covered by existing state or federal laws or regulations, used on the waters of Saugatuck harbor shall, during hours of darkness or low visibility, display 1 white light visible through an arc of 360° and of such intensity as to be visible on a dark night with a clear atmosphere at a distance of at least 1 mile.

Chart 14906.—From Saugatuck Harbor to South Haven Harbor is about 19 miles along shore in a southerly direction. A shoal with large boulders is located from 1½ to 3½ miles south of Saugatuck Entrance. It extends about a mile off shore with depths of 24 to 28 feet near its outer limit. Since scattered boulders are found on the bottom throughout this area, operators of small craft are cautioned to stay clear of the shoreline. South of this area, the shoal border narrows to less than ¾ mile. The shoreline is generally bluff with some steep clay banks.

South Haven Harbor, Mich.—This harbor is located at

Structures Across Kalamazoo River From Mouth to Allegan

No.	Location and name	Kind	Miles above mouth of river	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Submerged cable (Spear)	Power	1. 89	------	------	------	------	------	Approximate depth 16 feet.
2	Submerged cable (Mary)	Telephone	1. 99	------	------	------	------	------	Approximate depth 18 feet.
3	Submerged cable (Main)	do	2. 06	------	------	------	------	------	Approximate depth 21 feet.
4	Aerial cables	Electric	2. 78	------	------	------	25. 0	21. 0	Consumers Power Co.
5	Saugatuck-Douglas	Highway	2. 80	58. 0	58. 0	------	17. 1	13. 1	Fixed bridge. No lights.
6A	I-196 bridge	Highway	3. 35	------	------	72. 0	18. 8	14. 8	Twin-Fixed. Mich. State Hy. Dept.
7	New Richmond—Chesapeake & Ohio RR.	Railway	10. 80	41. 5	------	------	13. 1	------	Swing bridge. No lights.
8	New Richmond	Highway	10. 90	31. 0	31. 0	------	13. 6	------	Do.
9	Muskegon Corp	Pipeline	12. 90	------	------	------	------	------	Oil—at depth of 10.2 feet.
10	Michigan-Wisconsin	do	20. 00	------	------	------	------	------	Gas—at depth of 13.5 feet.
11	Allegan Dam	Highway	26. 10	------	------	------	------	------	Fixed bridge. Crosses dam.*
12	Huggins	do	33. 90	42. 0	42. 0	42. 0	8. 1	2. 5	Fixed bridge. No lights.
13	Allegan—Chesapeake & Ohio RR.	Railway	37. 50	32. 5	35. 0	------	8. 1	------	Swing bridge. No lights.
14	Allegan	Highway	37. 80	------	------	126. 0	19. 3	------	Fixed bridge. No lights.

*Boats must portage around dam.

the mouth of the Black River, about 77 miles northeasterly of Chicago Harbor and 93 miles southeasterly of Milwaukee Harbor. The entrance is protected by piers and the channel in the lower ¾ mile below the Dyckman Ave. bridge has been improved. The city of South Haven fronts on the Harbor. Black River is navigable for small craft to the fixed railroad bridge 2½ miles above the mouth and at the nominal head of navigation. Two lighted radio masts 1¼ miles northeast of the pierhead lights are prominent.

Local fish tugs ply in and out of the harbor throughout the year.

Channels.—The dredged entrance channel leads from deep water in Lake Michigan between parallel piers through the mouth of Black River upstream to a turning basin with its upper end about 0.7 mile above the mouth. In April 1978, the controlling depths were 14 feet through the approach channel and between the piers, thence 12 feet to the upper end of the turning basin except for minor shoaling along the channel limits and at the north end of the basin.

Currents in the river attain velocities up to 3 m.p.h.

Aids to Navigation.—South Haven South Pierhead Light, 37 feet above the water on a red conical tower, is located near the outer end of the south pier. South Haven North Pier Light, 28 feet above the water on a white skeleton tower, is located near the outer end of the north pier.

Harbor Facilities.—The basin is not adapted for anchorage of vessels, and mooring to the piers and revetments is prohibited. The inner harbor provides only such mooring facilities as are available at private wharves.

In 1969, the City and Michigan State Waterways Commission jointly completed docking facilities to accommodate small craft with water, electricity, sewage pump-out facilities and harbor attendant services.

A marina adjacent to the municipal facility provides gasoline, diesel fuel, a 25-ton hoist, open and covered dry winter storage, some marine supplies, pump-out station and engine repairs. Similar services are available above the Dyckman Avenue bridge.

Coast Guard Station.—South Haven Coast Guard Station, seasonally operated, is on the south side of the entrance to Black River. A radio guard is usually maintained during daylight hours on holidays and weekends.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

Slow—No Wake Speed.—See Regulations—State of Michigan, preceding.

Local Harbor Regulations.—On the waters of the Black River and the entrance channel, city of South Haven, Van Buren County, from the east corporation limits of South

Structures Across the Black River at South Haven, Mich.

No.	Location and name	Kind	Miles above North Pierhead Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Submerged cables	Electric	0.40						Approx. depth 30 feet. So. Haven Bd. of Pub. Wks. (2 cables).
2	Submerged pipeline	Water	.40						Approx. depth 30 feet. So. Haven Bd. of Pub. Wks. (1-12-inch main).
4	Dyckman Ave. bridge M-43.	Highway	.88			60.0	10.7	6.7	Bascule. New in 1968.*
5	Submerged cable		.89						Approx. depth unknown.
5A	Submerged pipeline		.89						Do.
6	Submerged pipeline		.93						Do.
6A	Submerged pipelines(2)		1.70						Do.
7	Aerial cable		1.87						

*Whistle for opening 3 long (— — —); a bell on the bridge sounds return signal.

Haven downstream to the westerly end of the entrance channel, it is and shall be unlawful for the operator of a vessel to exceed a slow-no wake speed.

Charts 14906, 14905.—Between South Haven and St. Joseph, about 22 miles southwesterly, the offlying water is clear of shoals outside a distance of ⅜ mile, and the shore is generally skirted by low bluffs for about the first 5 miles south of South Haven. South of this point, the bluffs are higher.

Water Intake.—A submerged water intake pipeline, starting from a point on the shore line 850 feet 092° from the South Haven South Pierhead Light, extends 2,210 feet 262° to a crib with 25 feet of water over it. This pipeline is sand plugged and has been abandoned since about 1952.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A submerged potable water intake pipeline of the City of South Haven, starting from a point on the shore line 1,020 feet 117° from the South Haven South Pierhead Light, extends about 5,700 feet 247° to a crib with 33 feet of water over it.

A submerged potable water intake pipeline, starting from a point on the shore line 5,830 feet 058° from the St. Joseph North Pierhead Light, extends 3,150 feet 316° to a crib with 27 feet of water over it.

Water Intake.—A submerged 10-foot diameter cooling water intake pipeline of the Consumers Power Co. starts from a point on the shore line about 5⅝ miles 194½° from South Haven South Pierhead Light and extends 3,375 feet 067¼° to a crib with 22 feet of water over it. The crib is not marked.

Charts 14905, 14930.—St. Joseph Harbor, Mich.—This harbor is located at the mouth of **St. Joseph River**, about 60 miles northeasterly across the lake from Chicago Harbor. A silver cupola about ¾ mile east-southeast of the South Haven South Pierhead Light and a lighted white tank about 1,100 feet northeast of the cupola are prominent when approaching the harbor. Local fish tugs and oil tankers ply in and out of the harbor throughout the year.

Channels.—A dredged entrance channel leads from deep water in Lake Michigan between parallel piers through the mouth of St. Joseph River upstream for about 1 mile to the junction with **Paw Paw River.** A turning basin is on the north side of the channel just below the junction. A canal extends from the turning basin through the mouth of Paw Paw River, thence continues eastward to Riverview Drive.

In June 1978, the controlling depths were 24 feet in the approach channel, thence 21 feet at midchannel to the canal with 18 feet in the turning basin except for shoaling to 14 feet in the north part, thence 18 feet in the canal except for shoaling to 12 feet in the north half of the channel upstream to the Paw Paw River, thence 15 feet in the upper 400 feet of the canal. The canal and the area of the junction of St. Joseph and Paw Paw Rivers are subject to shoaling.

Currents in the river attain velocities up to 3 m.p.h.

Navigation should not be attempted close to the piers due to stone riprap.

Above the Federal project, the St. Joseph River turns southward and flows between St. Joseph on the west bank

and the city of **Benton Harbor** on the east bank. In 1971, this reach had depths of 6 to 20 feet in the best channel, generally near the east bank.

Morrison Channel cuts across the southward turn in the St. Joseph River leaving the river about 1 mile above the pierheads and rejoining it about 2.5 miles above the pierheads. The channel is separated from the river channel by **Radio Island.** In 1971, Morrison Channel had a centerline controlling depth of 6 feet.

Above the dredged channel in the Paw Paw River, the crooked channel is navigable by small craft for about 2 miles to the Paw Paw Avenue bridge. In 1968, the centerline controlling depth was 1 foot.

Aids to Navigation.—St. Joseph North Pierhead Light, shown 31 feet above the water on a white cylindrical tower, is at the outer end of the north pier; a diaphragm foghorn sounds as required. St. Joseph North Pier Inner Light, shown 53 feet above the water on a white octagonal tower, is on the north pier about 315 feet 108° from the North Pierhead Light. South Pierhead Light on a red skeleton tower is near the outer end of the south pier.

Harbor Facilities.—Mooring to the piers and revetments is prohibited.

A public docking facility has been jointly constructed by the city and The Michigan Waterways Commission immediately upstream from the Coast Guard lifeboat station. Transient facilities are available, providing water, electricity, sewage pump-out facilities, gasoline, rest rooms, lights, a boat hoist and harbormaster services. Other private facilities are available along the river.

Coast Guard Station.—St. Joseph Coast Guard Station is located near the inner end of the north pier.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

Local Harbor Regulations.—Harbor regulations are enforced by the harbormaster and copies may be obtained from City Manager, City Hall, City of St. Joseph, St. Joseph, Michigan 49085.

Local Harbor Regulations.—Harbor regulations for the city of Benton Harbor are enforced by the harbormaster, who is the chief of police. Copies of the regulations may be obtained from the chief of police.

St. Joseph River, Mich.—This is a crooked stream obstructed by numerous shoals with depths in channel crossings of from 2 to 2½ feet. The part from St. Joseph Harbor to Berrien Springs, a distance of about 22 miles, was formerly under improvement by the Government to make a low-water channel 2 or 3 feet deep by removing snags and logs and closing secondary channels, or concentrating the flow by the construction of dams. No work has been done since 1915. Navigation for a draft of about 2 feet is limited to 7 or 8 miles upstream from the harbor. Power dams obstruct navigation in the river above Berrien Springs.

Section VII.—East, South, and West Shore From St. Joseph, Mich., to Wilmette, Ill.

Chart 14905.—From St. Joseph to Michigan City, the coast is clear to within ⅜ mile from shore for the entire distance of about 35 miles, except for an area southwesterly of St. Joseph entrance piers where a shifting shoal reaches out about ½ mile from shore.

The coast of Lake Michigan for about 7 miles south of St. Joseph is a moderate bluff; thence for a distance of about 8 miles to Bald Tom Hill, there is a range of hills from 200 to 400 feet in elevation; then for about 20 miles to Michigan City, the shore is composed of low hills. Donald C. Cook Nuclear Plant, about 10 miles south-southeast of St. Joseph, is conspicuous.

Abandoned Pipeline.—An abandoned potable water intake pipeline is located at the waterworks about one mile south of the pier at St. Joseph. The pipeline starts at a point on shore 6,530 feet 180° from St. Joseph North Pierhead Light and extends 1,480 feet 285½° into Lake Michigan to a crib in about 16 feet of water with 13 feet of water over the crib. It is not marked.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 CFR § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline is located at the waterworks about 1 mile south of the pier at St. Joseph starting from a point on shore 6,320 feet 179½° from St. Joseph North Pierhead Light and extending 1,430 feet 293½° into Lake Michigan to a crib with 13 feet of water over it. It is not marked.

Water Intakes.—A cluster of three water intake cribs for the Donald C. Cook Nuclear Plant are located in about 25 feet of water 2,000 feet offshore at a Point about 9.4 miles south of the St. Joseph breakwater. There is a clear depth of 12 feet over the cribs and they are not marked.

Outfall Pipelines.—Two outfall pipelines of the Donald C. Cook Nuclear Plant are located in about 15 feet of water 900 feet offshore at a point about 9.4 miles south of the St. Joseph breakwater. The depth over the outfalls is 10 feet and they are not marked.

New Buffalo, Mich. is about 25 miles southwesterly of St. Joseph or about 10 miles northeasterly of Michigan City.

Aids to Navigation.—The north and south breakwaters have lights at the outer ends, mounted on white steel columns 25 feet above the water.

Harbor Facilities.—A marina 2,600 feet south-southwest of the breakwater entrance provides transient berthing, gasoline, water, electricity, surfaced launching ramp, hoists handling vessels up to 30 tons, open and covered dry storage, marine supplies, pump-out service and complete marine repair.

Channels.—A dredged entrance channel leads eastward from deep water in Lake Michigan between converging breakwaters, thence southeast to the mouth of the Galien River and upstream for about 0.2 mile. In 1977, the controlling depth in the channel was 2½ feet (5 feet on the centerline).

The outer basin enclosed by the breakwaters has an area of about 6 acres; it is not adapted for anchorage of vessels, but reduces wave action in the lower section of the river. Mooring to the breakwaters is prohibited. Navigators are cautioned against navigating outside channel limits in the vicinity of structures protected by rock riprap along their sides.

Bridges, etc. Across St. Joseph Harbor, Morrison Channel, and Paw Paw River*

No.	Location and name	Kind	Miles above mouth of river	Draw or span openings clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	St. Joseph Harbor								
1	Chesapeake & Ohio Ry.	Railway	0.7	91	100	------	12.5	------	Swing. See Note 1.
1a	Submarine cable	Electric	0.8	------	------	------	------	------	Ind. & Mich. Electric Co. Approx. depth unknown.
2	Blossomland (US 33)	Highway	0.9	------	------	150	37.0	------	Bascule. See Note 2.
	Morrison Channel								
3X	Wayne Street I-94	Highway	1.3	------	------	90	36.0	------	Fixed, see Note 3.
3a	Aerial cable	Electric	1.5	------	------	------	56.2	52.2	Ind. & Mich. Electriic Co.
3b	Aerial cable	Electric	1.8	------	------	------	57.9	52.8	Ind. & Mch. Electric Co.
4	Aerial cable	Electric	1.95	------	------	------	63.5	58.4	Ind. & Mich. Electric Co.
	Paw Paw River								
5	ConRail bridge	Railway	1.3	------	------	12	3.5	------	Pile trestle. Fixed. No lights.
6	Chesapeake & Ohio Ry.	do	1.5	------	------	45	6.5	------	Do.
6a	Aerial cable	Electric	1.6	------	------	------	31.7	28.5	Ind. & Mich. Electric Co.
7	Klock Street bridge	Highway	2.0	------	------	53.0	9.4	5.4	Fixed. No lights.
8	North Shore Road	do	2.5	------	------	39.1	9.3	------	Do.
9	Paw Paw Avenue	do	3.1	------	------	45.8	9.5	------	Fixed.
10	Chesapeake & Ohio Ry. bridge.	Railway	3.15	------	------	------	8.0	------	Do.

***NOTE: See table following for St. Joseph River upstream of this data.**

Signals for Opening Draws of bridges 1 and 2: Steamer whistles sound 2 short, 1 long (— — —); sailing vessels, 3 long blasts of horn (— — —). Answered by bell on highway bridge.

NOTE 1.—Red light on each end of each abutment pier, on each end of guard pier, and on each side of center pier; 3 compound red-and-green lights on top of draw (in center and at each end) show red up and down stream when bridge is closed and green when open.

NOTE 2.—Red light on each end of each roller pier; light on each side of free end of each leaf shows red when bridge is closed and green when open.

NOTE 3.—A red light is on each of both piers in the main stream. A green channel light marks the under-clearance of the bridge while proceeding upstream.

Bridges, etc., Across St. Joseph River, St. Joseph Harbor to Berrien Springs

No.	Location and name	Kind	Miles above St. Joseph Harbor	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Twin Cities Bicentennial bridge (Main Street).	Highway	0.11			100	19.0		Bascule. See Note 2.
2	Aerial cable	Electric	.1				67.7		Ind. & Mich. Power Comm.
3	do	do	.4				76.2	72.2	Ind. & Mich. Elect. Co.
5	Napier bridge	Highway	2.0	200	200		28.0		Fixed. New const. in 1966.
6	Aerial cables	Electric	4.0				57.2	50.2	Ind. & Mich. Elect. Co. (2 cables).
7	do	do	4.6				54.2	46.4	Do.
8	I-94 bridge	Highway	4.8	78.7	78.7		20.9		Fixed. 7 spans.
9	Aerial cables	Electric	5.2				54.6	45.9	Ind. & Mich. Elect. Co. (2 cables).
10	Somerleyton bridge	Highway	5.5	124	†94		18.2		Fixed truss; 2 spans. No lights.

†Opening not available for use.

NOTE 1.—Two red lights on each abutment and 4 on center pier, 3 compound red-and-green lights on draw span (at center and on each end) show red up and down stream when bridge is closed and green when open.

NOTE 2.—Each fender pile cluster marking port and starboard sides of the main channel shows 3 red lights mounted 3 feet above the water which can be seen when proceeding upstream. A red light is on top of the port backup pier near the shore. Two lights on the movable center span show red when the bridge is closed and green when open.

Potable Water Intakes. See **42 U.S.C. 264**, published in Certain Laws, preceding, and **21 CFR § 1250.93** of Rules and Regulations, preceding. A potable water intake crib, with its top submerged to a depth of 25 feet, is located about 5,000 feet 265° from the entrance to New Buffalo harbor. Two potable water intake pipelines are located about 35,200 feet 063° and 17,300 feet 070°, respectively, from Michigan City Breakwater Light. Three intake cribs, with their tops submerged to depths of 22, 29 and 35 feet, are located about 4,200 feet 058°, 3,300 feet 056° and 3,850 feet 058°, respectively, from Michigan City Breakwater Light.

The **State boundary** between Michigan and Indiana is about 4½ miles southwest of New Buffalo Harbor entrance. **Central Standard Time** is observed on the lake shore areas of Indiana and in the States of Illinois and Wisconsin.

Michigan City Harbor, Ind.—This harbor is at the mouth of Trail Creek, about 33 miles east of Calumet Harbor or South Chicago, and about 38 miles from the mouth of the Chicago River.

Local fish tugs ply in and out of the harbor throughout the year.

Channels.—The entrance to Trail Creek is protected on the west by a detached breakwater. A dredged entrance channel leads southward from deep water in Lake Michigan past the east end of the breakwater, turns southeastward, then southward again between two piers at the mouth of the creek. Inside the creek, the channel leads upstream for about 1.3 miles to the E Street bridge. Turning basins are on the south side of the channel just inside the mouth and on the southwest side about 0.9 mile above the mouth. A small-craft basin, on the northeast side of the entrance channel, is entered through a cut in the east pier and is protected on the north side by a breakwater.

In August 1978, the controlling depth was 11 feet in the approach channel, thence in 1977, 17 feet at midchannel through the first turning basin, thence 16 feet to Franklin Street bridge, thence 8 feet to the Naval Armory slip, thence 4 feet to the second turning basin, thence 4 feet to Sixth Street bridge, thence 1 foot to E Street bridge. In

Bridges, etc., Across Trail Creek

No.	Location and name	Kind	Miles from outer end of west pier	Draw or span openings-clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Turning Basin No. 1		0.35						
1	Franklin Street bridge	Highway	.51			120.2	17.7		Bascule.
2	Submarine pipeline	Water	.62						18″ pipe. Approx. depth 25 feet.‡
3	Submarine pipeline	Water	.63						24″ pipe. Approx. depth 29 feet.‡
4	Submarine pipeline	Water	.68						20″ pipe. Approx. depth 29.7 feet.‡
5	ConRail bridge	Railway	.88	41.6	44.6		7.6		Swing.
5A	Submerged cable		.87						
6	Second Street bridge	Highway	.94			79.9	12.5		Bascule.
	Turning Basin No. 2		1.04						
7	Sixth Street bridge	Highway	1.20			69.6	10.3		Bascule.
7A	Aerial cable		1.34						
8	"E" Street bridge	do	1.48						Fixed. Head of navigation.
9	Submarine pipeline		1.49				0.0		24″ pipe. Top of pipe 2.0 feet above L.W.D.

‡Signs on both banks marking crossing locations.

Whistle Signals for Opening Draws: Highway bridges, 3 blasts (— — —); ConRail bridge, 5 blasts (— — — — —).

Lights.—The bridges are all provided with red lights on abutments, protection piers, and the movable structures, those on the last-named parts being so arranged as to show red when the bridge is closed and green when open.

1971, the second turning basin had a controlling depth of 1 foot in the north part with the south part bare, and the small-craft basin had depths of 12 feet in the north part and 8 feet in the south part.

The piers and breakwaters are riprapped with large stones on all water sides. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Aids to Navigation.—East Pierhead Light is on the outer end of the east breakwater pier; an air diaphragm foghorn sounds when required. Breakwater Light is on the northeast end of the westerly breakwater. Breakwater South Light is on the southwest end of the westerly breakwater.

West Pierhead Light is on the north end of the west pier. Outer Basin Light is on the east pier at the south side of the entrance to the yacht harbor.

Small-craft Facilities.—Boat slips and a fueling dock are available in the basin on the northeast side of the entrance channel.

Coast Guard Lifeboat Station is located on the east side of the harbor entrance.

Bridge Regulations.—See 33 U.S.C. 499 published in Certain Laws, preceding, and 33 CFR § 117.680 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

Local Harbor Regulations.—Local regulations have been established by the city of Michigan City and are enforced by a harbormaster. Copies of regulations may be obtained from the harbormaster's office at Washington Park Marina, just east of the Coast Guard Station.

From Michigan City to Gary, Ind., about 22 miles southwesterly, the coast may be approached to within ⅜ mile. A submerged concrete slab, covered 0.5 foot, is about 8,175 feet 226° from Michigan City East Pierhead Light. The coast is bordered by hills from 100 to 200 feet in elevation. The east coast of Lake Michigan is generally composed of fine sand which is set in motion in large quantities by severe onshore winds and storms, and in

consequence this coast is marked by many odd and hilly formations of sand, frequently bare. The southerly end of the lake is fully exposed to storms from a northerly direction, the maximum unimpeded sweep from a little east of north being about 300 miles; all severe storms from the arc included between northeasterly and northwesterly directions create hazardous conditions, including powerful and dangerous seas, and strong currents running from east to west or from west to east, dependent upon the direction of prevailing winds. An added unfavorable condition is found in the sandy nature and gentle slope of the lake bottom, depths of 70 feet occurring 8 to 10 miles from shore. About 7 miles southwest of Michigan City, the State of Indiana has developed the Indiana Dunes State Park.

National Park Service.—Public Law 80-761, 89th Congress, November 5, 1966, authorized the establishment of the Indiana Dunes National Lakeshore. For the purposes of said Act, the Lakeshore was established 8 September 1972. Rules and Regulations governing the Lakeshore area are contained in Title 36, Part 31, Code of Federal Regulations. Copies of this publication are generally available in major libraries.

The land acquisition program, generally between Michigan City and Gary, Ind., is well underway. However, the National Park Service does not provide facilities for boaters at this time. Only certain sections of land to be included in the Park have actually been acquired to date. All mariners are advised that portions of the shore area remain as private property and occupancy in any manner may constitute trespassing on private property.

Water Intake.—A cooling water intake well of the Northern Indiana Public Service Co., Hammond, Ind., is 110 feet in diameter, at an elevation of +8 feet, and is located in about 21 feet of water about 1,550 feet offshore from the sea wall at Baileytown, Indiana. The intake is marked with a light about 2,250 feet 090° from Burns Waterway Harbor East Pier Light.

Burns Waterway Harbor, Ind. is an artificial harbor formed by a breakwater extending lakeward from the shore and turning eastward to enclose a harbor basin and two dredged arms which extend southward from the basin into the shoreline. The harbor is entered southwesterly from deep water in Lake Michigan on the south side of the breakwater.

In April 1978, the controlling depths were 30 feet in the entrance channel, 26 feet in the harbor basin, 26 feet in the east harbor arm, and 25 feet in the west harbor arm.

The Indiana Port Commission, Port of Indiana-Burns Waterway Harbor, P.O. Box 189, Portage, Ind. 46368, has constructed a bulkhead and fill in the area between the east harbor arm and the west harbor arm and a public terminal and transfer facility in the West Harbor Arm.

Along with this harbor development, Bethlehem Steel Corporation has constructed a bulkhead and fill that extends to the east about 5,000 feet.

These bulkheads are riprapped with stone. Mariners are advised to exercise caution when navigating in this area.

Aids to Navigation.—Burns Harbor North Light 2 is on the easterly end of the north breakwater. Burns Harbor Entrance South Light 3 is on the end of a small breakwater arm on the south side of the entrance channel. Burns Harbor West Light 4 marks the northwest corner of the junction of the west and north breakwaters.

The Indiana Port Commission operates a 35 watt VHF-FM radio station utilizing channels 16, 10, 12, and 68. Two-way communications with commercial and pleasure craft provides improved traffic control and in conjunction with State Police patrol boat, improved harbor security. The call letters are KVF 866.

Obstruction.—A submerged pipe, covered 1.5 feet, has been reported about 125 feet north of Burns Harbor North Light 2.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Burns Waterway Harbor, Ind., is contained in the Port Series No. 48 (Revised 1973) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Water Intake.—A Midwest Steel Corp. intake, with its top submerged to a depth of 28 feet is located in about 34 feet of water 2,900 feet offshore at a point about 100 feet east of Burns Waterway.

Burns Ditch, located about 15 miles southwest of Michigan City or about 7 miles east of Gary Harbor, is a drainage canal with a main channel about 1½ miles long, extending southward from the lake to two branches in the marshes of the Little Calumet River; it is not navigable except by boats of shallow draft.

Soundings completed in Aug. 1971 indicated controlling depths as follows: 5 feet in the approach to Burns Ditch: 3 feet inside the entrance for a distance of 6,000 feet south of the entrance.

Aids to Navigation.—Midwest Steel Co., located on the east side of Burns Waterway, maintains the following lights: Burns Waterway West Pier Light located 39,200 feet 089.5° from Gary Breakwater Light; Burns Waterway East Pier Light located 77 feet 125° from Burns Waterway West Pier Light; Burns Waterway West Pier Inner Light located approximately 200 feet 180° from Burns Waterway West Pier Light.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 CFR § 1250.93 of Rules and Regulations, preceding. A 60-inch intake of the Gary-Hobart Water Corp., with its top submerged to a depth of 15.7 feet, is located in 25 feet of water 2,500 feet offshore at a point about 1.4 miles west of Burns Ditch. The intake pipeline is parallel to Burns Ditch entrance.

Dumping Grounds Regulations.—See 33 U.S.C. 407, 419 and 421, published in Certain Laws, preceding, and 33 CFR § 205.40 of Rules and Regulations, preceding.

Charts 14905, 14927.—Gary Harbor, Ind.—This is a private harbor located at the southerly extremity of Lake Michigan, about 22 miles southwesterly of Michigan City or 14 miles southeasterly from Calumet Harbor entrance. The entirely artificial harbor was developed and is owned by United States Steel Corp.

Channels.—The harbor comprises a channel extending

southward into the shoreline for about 1 mile between parallel piers to a turning basin. The entrance to the channel is protected by a breakwater extending generally northeastward from the west side of the entrance. A bulkhead, enclosing a fill area along the shore, extends 1.8 miles east from the east side of the channel entrance and is marked at its east end by a light.

Depths in the channel are maintained to at least 27 feet. Just inside the entrance, the channel is crossed by an overhead pipeline with a clearance of 125 feet and an overhead power cable with a clearance of 132 feet. About 0.65 mile above the entrance, the channel is crossed by an overhead conveyor with a clearance of 125 feet.

Aids to Navigation.—The United States Steel Corp. maintains the following lights: A light is on the breakwater, 50 feet from its outer end; a fog horn sounds at this light as required. In case of failure of the main breakwater light, a standby acetylene light located 10 feet above it, will be shown. Lights mark the east and west pierheads.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 CFR § 1250.93 of Rules and Regulations, preceding. The City of Gary's intake crib, about 60 feet in diameter, with its top submerged to a depth of 25 feet, is located in 40 feet of water about 7,100 feet 301° from the breakwater light.

An intake, with its top submerged to a depth of 27 feet, is located in 35 feet of water about 11,850 feet 278° from the breakwater light.

An intake of the United States Steel Corporation, with its top submerged to a depth of 28 feet is located in 36 feet of water about 14,300 feet 283° from the breakwater light.

Charts 14905, 14926, 14927, 14929.—Buffington Harbor, Ind.—This is a private harbor owned by the Universal Atlas Cement Division of the U.S. Steel Corp., and located about 2½ miles southeast of Indiana Harbor and 4½ miles northwest of Gary Harbor. The harbor is built in the lake in front of the company's plant, extending out to a bulkhead line about 2,400 to 2,900 feet beyond the shore line, west of the harbor.

Channels.—The habor basin is protected on the west and north sides by a breakwater which extends from the shore westward of the wharf on the east side of the basin. The basin has been dredged to 26 feet, but the depths gradually decrease to about 12 feet along the breakwater on the west side of the harbor.

From the northeast end of the wharf, the entire shoreline for about 4½ miles southeastward to Gary Harbor has been bulkheaded and filled.

Aids to Navigation.—The company maintains a light on the easterly end of the breakwater; also a light with a fog diaphone attached, at the outer end of the easterly concrete dock.

A range of daymarks, with lights, marks the course for entrance on a line parallel to and 250 feet west of the line of the concrete dock. The front mark, at about the middle of the south-side bulkhead, is a black and red rectangular target, outlined by lights to show a circle at night. The rear mark, on a building 1,000 feet 236½° from the front, is a black and red rectangular target, outlined in part by lights to show V-shape at night.

From Gary, Ind., to Wilmette, Ill., the entire Lake Michigan shore line is occupied by extensive private commercial facilities, public utilities and facilities as well as boat clubs and yacht clubs.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 CFR § 1250.93 of Rules and Regulations, preceding. East Chicago's intake crib, with top submerged to depth of 27 feet, is located to the east of Indiana Harbor, at a point about 6,335 feet 014° from Buffington breakwater light.

Indiana Shoals.—The approach to Indiana Harbor is obstructed by a foul area which extends to the northeastward a distance of 5 miles, and having several ridges of 15 to 18 feet depth. A buoy is maintained in deep water off the outer, northeasterly limit of this shoal area. Bearings from the buoy are as follows: Michigan City east pierhead lighthouse, 089°30′; entrance to Gary Harbor, 167°30′; Calumet Harbor light, 276°.

Wreck.—An old wreck with 22 feet of water over it lies in deep water to the north of Indiana shoals, at a location 6 miles 070° from Calumet Harbor light. It is marked off its west side by a buoy.

A research tower, marked by a private seasonal light 30 feet above the water, is about 700 feet northwest of the wreck in 41°46′11″ N., 87°23′45″ W. The tower is supported by cables that may extend up to 50 feet from its base. Mariners are advised to exercise caution while navigating in the vicinity.

Indiana Harbor, Ind.—This is an artificial harbor located at **East Chicago, Ind.**, about 2½ miles northwest of Buffington Harbor or about 7 miles southeast of Calumet Harbor. It comprises breakwaters, an entrance channel, an outer harbor basin and a canal entrance channel between areas of made land inclosed by piers and bulkheads built into the lake from the original shore line and occupied by the Youngstown Sheet & Tube Co. on the northwest side and by the Inland Steel Co. on the southeast side. The development further includes Indiana Harbor Canal extending inland from the canal entrance channel on the easterly side of the five railroad bridges, with branches extending toward Lake George on the west and to the Grand Calumet River on the south.

Channels.—The dredged entrance channel leads southeastward from deep water in Lake Michigan between breakwaters to an outer harbor basin. From the outer harbor basin, a canal entrance channel extends southwest to **Indiana Harbor Canal**, which continues southwest for 1.4 miles to a turning basin at **The Forks**. The channel width in the canal is restricted by the clear width of the bridge span openings of 61.7 feet. From The Forks, **Calumet River Branch** extends south for about 0.4 mile to just below Columbus Drive bridge, and **Lake George Branch** extends west for about 0.6 mile.

In 1976–1977, the controlling depths were 28 feet at midchannel in the entrance channel, thence 23 feet in the outer harbor basin, thence 21 feet in the entrance channel to Indiana Harbor Canal, thence 19 feet at midchannel through the canal, thence 22 feet in the turning basin at

The Forks except for shoaling along the southwest and east edges, thence in the Calumet River Branch depths decreasing from 22 feet at the north end to 7 feet at the south end, and thence in Lake George Branch, 20 feet at midchannel to Indianapolis Boulevard bridge with depths decreasing to 13 feet at the west end.

Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Aids to Navigation.—East Breakwater Light is on the outer end of the east breakwater extension; a fog diaphragm horn and a radio beacon are operated at this station. Indiana Harbor Light 6 marks the east end of the northerly breakwater. Indiana Harbor Light 5 marks the south end of the east breakwater.

Revetment lights are maintained by the Inland Steel Co. to mark the outer corners of the extension-fill revetment in the lake to the east of the outer harbor.

Indiana Harbor Light 7 is located on the east side of the entrance to the inner harbor channel.

Indiana Harbor Light 8 is located on the west side of the entrance to the inner harbor channel leading into the Indiana Harbor Canal.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Indiana Harbor, Ind., is contained in the **Port Series No. 48** (Revised 1973) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Cables, Pipelines.—Various submarine cables, conduits, and pipelines cross the canal below the project depth of 22 feet at the following locations: About 30 and 80 feet lakeward and 40 feet landward of the Baltimore & Ohio Railroad bridge; about 30 feet landward of the Indiana Harbor Belt Railroad bridge; about 80 feet lakeward and 40 feet landward of the Penn Central (Penn. RR) bridge; about 60 feet landward of and in the draw of the Dickey Place Bridge; along both sides of the Canal Street Bridge; at the lakeward entrance to "The Forks"; and in the Lake George branch about 850 feet lakeward, 750 feet landward and along both sides of the Indianapolis Boulevard Bridge; and about 150 feet lakeward and 50 feet landward of the Baltimore & Ohio Chicago Terminal Railroad bridge.

Floating Oil Boom.—A floating oil boom which extends across the Lake George branch is permanently located at a point about 800 feet lakeward of the B & OCT RR bridge.

The low fixed bridges across the Calumet River branch of the canal preclude navigation above 141st Street for any but small craft.

Bridge Regulations.—See **33 U.S.C. 499**, published in Certain Laws preceding, and **33 CFR § 117.676** of Rules and Regulations, preceding.

The State boundary between Indiana and Illinois is just west of the powerplant about 4 miles west-northwest of Indiana Harbor entrance.

Water Intake.—The Union Carbide Corp., Chemical & Plastic Div., water intake with 12 feet of water over it and marked by a buoy, is located in 22 feet of water about 9,050 feet 289° from Indiana Harbor west breakwater light and 1,690 feet from shore.

Potable Water Intake.—See **42 U.S.C. 264**, published in Certain Laws, preceding, and **21 CFR § 1250.93** of Rules and Regulations, preceding. The Amoco (American) Oil Co. has a potable water intake with 15 feet of water over it located in 20 feet of water about 8,810 feet 269° from Indiana Harbor east breakwater light and about 1,390 feet from shore. It is not marked.

Water Intake.—The Amoco (American) Oil Co. has a water intake with 14 feet of water over it located 8,870 feet 271° from Indiana Harbor west breakwater light and about 1,670 feet from shore.

Potable Water Intakes.—See **42 U.S.C. 264**, published in Certain Laws, preceding, and **21 CFR § 1250.93** of Rules and Regulations, preceding. The Hammond intake crib, marked by a light on a white steel tower, is located in 22 feet of water about 2⅜ miles 166° from Calumet Harbor Light and about 4,500 feet from shore. A second crib is located in about 18 feet of water and about 1,500 feet from shore on the same intake pipeline.

Water Intakes.—A privately maintained buoy in 14 feet of water about 2,640 feet 250° from Hammond Intake Crib Light marks the American Maize Products intake head.

The riser in Lever Brothers' intake line is located in 16 feet of water about 2,750 feet southwesterly from Hammond Intake Crib Light.

From the northwest corner of the property at the shore line, a bulkhead inclosing the property of the Commonwealth Edison Co. of Indiana, Inc. extends 1,200 feet into Lake Michigan from immediately east of the Illinois-Indiana State line.

Shoals in Calumet Harbor Approach.—Sweeping operations in 1935 and 1936 showed limiting depths on shoal areas as follows: A rock and clay shoal about 1,000 feet across and with least depth of 21.3 feet, is located about 8,000 feet southeasterly of Calumet Harbor Light. It is marked to the southeast by Calumet East Shoal Buoy 4 located in 29 feet of water, 6,750 feet 068° from Calumet Harbor Breakwater South End Light. The buoy marks the north approach channel limit. Two rock shoals with least depth of 23.5 feet, about 1,015 feet apart on a northeast and southwest line, are located 11,500 feet northeasterly from Calumet Harbor Light. Another small shoal with least depth of 27 feet is located 13,435 feet 052° from Calumet Harbor Light. Calumet Northeast Buoy 2, located in 40 feet of water, 14,000 feet 053° from Calumet Harbor Light, marks the easterly side of the shoals.

Dumping Grounds Regulations.—See **33 U.S.C. 407, 419 and 421**, published in Certain Laws, preceding, and **33 CFR § 205.40** of Rules and Regulations, preceding.

Calumet Harbor (South Chicago Harbor), Ill. and Ind.—This harbor is located at the mouth of Calumet River, about 14 miles northwest of Gary Harbor, Ind. or about 12½ miles southerly from Chicago Harbor(see Calumet River, Ill. and Ind. following).

Channels.—A breakwater and breakwater extension extend east from the shore about 0.5 mile north of the mouth of Calumet River and turn southeast to protect

Bridges, etc. Across Indiana Harbor Canal

No.	Location and name	Kind	Miles from old harbor entrance	Draw opening—clear width, center	Maximum clear height above low-water datum	Remarks
	Main Channel					
				Feet	*Feet*	
1	Elgin, Joliet & Eastern Ry. bridge	Railway	0.62	61.7	8.5	Bascule.
	Overhead wire		.62		199	
2	Baltimore & Ohio RR. bridge	Railway	.64	66.0	8.9	Do.
3	Penn Central (NYC RR) bridge	do	.65	65.6	7.7	Do.
4	do	do	.66	65.6	7.8	Bascule. Used by Indiana Harbor Belt RR.
4A	Overhead pipeline		.67	65.8	125.0	
5	Indiana Harbor Belt RR. bridge	Railway	.67	65.8	7.8	Bascule. In permanent open position.
6	Penn Central (Penn. RR) bridge	do	.91	65.0	6.3	Bascule.
	Overhead wire—NIPS		1.12		110	
7	Dickey Pl. bridge	Highway	1.14	118.5	18.3	Do.
	Overhead wire		1.15		145.0	
	Turning Basin		1.64			
	Overhead wire—NIPS		1.78		140	
8	Canal St. bridge	Highway	1.79	65.6		See Note 1.
9	Elgin, Joliet & Eastern Ry. bridge	Railway	1.81	65	5.4	Bascule.
	The Forks (turning basin)		2.01			At junction with Lake George branch.
	Calumet River Branch					
10	141st St. (Columbus Dr.) bridge	Highway	2.50	41	8.1	Temporary trestle.
11	South Chicago & Southern and Baltimore & Ohio Chicago Terminal RR. bridge.	Railway	3.11	34.2	3.7	Fixed.
12	Chicago Ave. bridge	Highway	3.19	50	9.7	Fixed girder
13	151st St. bridge	do	3.76	66	11.4	Double-leaf bascule.
14	Indiana Harbor Belt RR. bridge	Railway	3.89	36	4.7	Trestle.
15	Elgin, Joliet & Eastern Ry. bridge	do	3.90	52	3.2	Do.
	Lake George Branch					
16	Indianapolis Blvd. bridge	Highway	2.51	64.4	12.3	Bascule.
	Overhead wire		2.51		111.1	
17	Baltimore & Ohio Chicago Terminal RR. bridge.	Railway	2.94	65.0	5.6	Fixed.
18	Aerial cable		2.99		35.5	
	Jones & Laughlin fill		3.31			Solid fill.

NOTE 1.—Bridge leaves removed.

the river entrance and provide an outer harbor of refuge 1 square mile in extent. A dredged approach channel from Lake Michigan leads southwest around the south end of the breakwater extension to the outer harbor. From the west end of the outer harbor, a channel leads through the mouth of the river upstream for about 0.6 mile to the Elgin, Joliet & Eastern Railway bridge.

In 1964–73, the controlling depth was 29 feet in the approach channel, thence in 1973–1978, 25 feet in the outer harbor except for lesser depths along the edges and depths

decreasing to 23 feet in the approach to the river mouth, thence in 1977, 24 feet at midchannel in the river channel upstream to the Elgin, Joliet & Eastern Railway bridge except for shoaling along the edges.

The gap between the breakwater and the extension provides an entrance to the harbor for small craft. However, small craft should exercise caution when using the entrance gap. Dangerous currents frequently exist in the entrance gap, especially during storms. Hazardous currents are also caused by surges resulting from a sudden rise or fall in the lake level. This frequently occurs during periods of calm. The Lake Carriers' Association recommends that cargo vessels use the south entrance exclusively.

Aids to Navigation.—Calumet Harbor Breakwater South End Light, 50 feet above the water, is shown from a white square skeleton tower on the southeast end of the detached breakwater and marks the ship channel to the harbor. A fog signal and marker radiobeacon are at the light. Calumet Harbor Light, 51 feet above the water, is shown from a white cylindrical tower with building attached and marks the northerly side of the small-craft entrance gap in the breakwater. The southerly side of the gap and the north and south side of the river entrance are marked by lights.

Harbor Facilities.—U.S. Steel Corp.'s private slips include the north slip which is 3.000 feet north of Calumet River entrance and is approached through deep water in the area sheltered by the breakwater. The approach is marked by a range of lights and daymarks; the front light is shown on a steel tower on the north side of the slip entrance; the rear light, 1,100 feet 288½° from the front light, is 119 feet above the water on the Plate Mill Building. A light, mounted on a steel tower, marks the south side of the entrance to the north slip. Two aerial cables with a clearance of 109 feet extend across the north slip in the vicinity of North Slip South Light-North Slip Range Front Light. The south slip opens off the north side of the Government entrance channel near its inner end which is just east of the original Calumet River mouth.

In 1974, the U.S. Steel Corp. installed a system of bubbler pipes across the bottom at the mouths of the North and South Slips in Calumet Harbor. Warning signs are located in the area to prevent damage to the pipelines. Vessel masters are cautioned not to drag or drop anchor in the vicinity.

Special Notice for Vessels Anchoring in Outer Harbor.—The breakwater affords protection to the river entrance and to an exterior harbor about 1 square mile in area. This is the most important harbor of refuge on the south end of Lake Michigan, and in times of severe storm, shelter is sought by a large number of vessels. It is therefore important that anchorage space within the harbor be utilized in an orderly manner. Accordingly, it is requested that vessels do not anchor closer than 1,000 feet to any part of the breakwaters unless no other anchorage space is available, and that, if it is necessary to anchor closer than 1,000 feet to the breakwater, vessels anchor in such manner as not to unreasonably obstruct the free passage and progress of other vessels through the harbor.

In general, the dredged areas of the outer harbor do not extend closer than 300 feet from the breakwaters. Mariners should exercise caution and not attempt to navigate in the undredged areas adjoining the breakwaters.

A submarine power cable, lying parallel to and along the harbor side of the breakwaters, extends from the shore end of the old breakwater and across the entrance gap to the southeasterly end of the breakwater extension. Mariners should not drag anchor in the vicinity of the cable.

Navigators are cautioned against navigating outside channel limits in the vicinity of structures protected by rock riprap along their sides.

Depths in the undredged portion of the harbor lying between the river entrance channel and the north slip and extending a maximum distance of 1,500 feet east of the U.S. Steel Corp.'s east bulkhead vary from 0 to 28 feet, with the maximum occurring only at the east edge and northerly part thereof leading into the north slip.

Coast Guard Station.—Calumet Harbor Coast Guard Station is on the lake front in the southerly part of Calumet Park, about 1.1 miles south of Calumet River entrance.

Calumet River, Ill. and Ind.—The Calumet River connect with Lake Michigan at Calumet (South Chicago) Harbor (previously described). Since the opening of the Calumet-Sag Channel, the river has a gentle flow away from the lake except at times of heavy rains, floods, or sudden fluctuations of the lake level. Turning Basin No. 5 is located about 6.14 miles up the river from the east end of the north pier at The Forks where there is a connection to the west with Lake Calumet. About 1.61 miles above The Forks, or about 7.75 miles from the end of the north pier, is the junction of Calumet River and Little Calumet River. From this junction northeasterly about 0.42 mile along Little Calumet River is the junction with Grand Calumet River.

Channels. A dredged channel leads from the west limit of Calumet (South Chicago) Harbor, at the Elgin, Joliet & Eastern Railway bridge, upstream in the Calumet River for about 5.5 miles to Turning Basin No. 5. Turning Basin Nos. 1 and 3 are on the east side of the channel 0.9 and 4.5 miles above the mouth of the river, respectively.

In 1977, the controlling depth was 23 feet from the mouth of the river upstream to Turning Basin No. 5 except for shoaling along the edges, thence 23 feet in Turning Basin No. 1, 25 feet in Turning Basin No. 3 except for shoaling along the edges, and 25 feet in Turning Basin No. 5. Several large pieces of concrete have fallen into the water along the south edge of Turning Basin No. 3 and pose a potential danger to navigation.

From Turning Basin No. 5, the Illinois Waterway project provides for a project depth of 9 feet through the Calumet and Little Calumet Rivers to the Calumet Sag Channel.

Dry Docks.—Two dry docks owned by the American

Ship Building Co. and located near 101st Street, about mile 1.95, have dimensions as follows:

	Dock No. 1	Dock No. 2
		Feet
Length of ship overall	Using as a wet slip	730
Width of entrance at top		88
Width of entrance at bottom		77½

Lake Calumet is about 2 miles long north and south and about 1¼ miles wide, has practically the same level as Lake Michigan, and has an average depth of about 2 feet. A temporary earth dike has been constructed at the southerly end of Lake Calumet by the Chicago Regional Port District.

In 1977–March 1978, the dredged channel, which leads northwestward from Turning Basin No. 5 in Calumet River to Lake Calumet, had a controlling depth of 25 feet except for shoaling to 11 feet in the northwest corner and shoaling along the edges.

T. J. O'Brien Lock and Dam.—The Thomas J. O'Brien Lock and Dam in the vicinity of 134th Street, were completed in 1960. The lock is on the west side of the Calumet River and is 110 feet wide and 1,000 feet long with guide walls 1,000 feet long on both the upstream and downstream ends. The depth over the sills is 15.6 feet. A dam with controlling works extends across the easterly section of the river from the lock wall to the east shore allowing passage through the lock only.

Navigation through the lock will be governed by the "Regulations Prescribed by the Secretary of the Army for Ohio River, Mississippi River above Cairo, Illinois and Their Tributaries; Use, Administration and Navigation." See **33 CFR § 207.300** of Rules and Regulations, preceding. Compliance with these regulations will be strictly enforced.

Dependent on river conditions, the lakeward, landward or both pairs of lock gates will be operated for the passage of all traffic. Particular reference is made to the red, amber or green flashing traffic signal lights which will govern the entrance into the lock. These lights are located on the land lock wall near the upper and lower lock gates.

If for any reason the lock is not being operated, the lock gates at both ends of the lock chamber will be fully opened. At such times navigation through the lock remains under the control of the lockmaster or his assistants and will be governed by the following:

b. *Commercial Navigation*

(1) Speed through lock chamber not to exceed 4 m.p.h.

(2) Passing in lock chamber in either direction prohibited.

(3) Stopping along or tying up to lock or guide walls prohibited.

c. *Recreational Navigation*

(1) Speed through lock chamber to be commensurate with safety but not more than 4 m.p.h.

(2) Not permitted to pass commercial craft in either direction.

(3) Lock to be used for through navigation only.

Rules of the Road.—The demarcation line between the "Rules of the Road—Great Lakes" and "Rules of the Road—Western Rivers" on the Calumet River is the Thomas J. O'Brien Lock and Controlling Works (Mile 6.90 on the Main River in the Table of Bridges, etc., Calumet River and its Branches) [**33 CFR § 95.02**]

Charts 14905, 14926, 14927.—Grand Calumet River formerly emptied into Lake Michigan within the present limits of Gary, Ind.; but its mouth is closed and it is now a dead river about 18 miles long, with only a small drainage area, with banks rising just above the water surface, and having no current except what is caused by floods and freshets, by water discharged by industrial plants, or by fluctuations in Lake Michigan. The city of **Hammond, Ind.**, is situated on the Grand Calumet about 3.18 miles above the junction of the Calumet and Little Calumet Rivers. About 2.93 miles east of Hammond there is a connection with Lake Michigan through the Indiana Harbor Canal (previously described). Except for the existence of several shoals, the river is navigable by light-draft launches, such as can pass under bridges in limited reaches. At Hohman Avenue, Sohl Avenue and Columbia Avenue in Hammond, bridges have been replaced by temporary earthfill causeways provided with culverts to carry the flow.

Little Calumet River is about 60 miles long, with a large drainage area having a large flood discharge but small low-water discharge. A channel 9 feet deep and 300 feet wide is available for boats, such as can pass under bridges, from its junction with the Calumet River cut-off channel (mile 7.69) to its junction with Calumet-Sag Channel, about 13.65 miles from the mouth of Calumet River. The river is not navigable above Blue Island except by rowboats, and rapids with rock bottom obstruct even these to some extent.

Bridge Regulations.—See **33 U.S.C. 499**, published in Certain Laws, preceding, **33 CFR § 117.641** and **33 CFR § 117.670** of Rules and Regulations, preceding.

Local Harbor Regulations.—Local harbor regulations for Calumet (South Chicago) Harbor have been established by the Chicago Regional Port District and are enforced by various local law enforcement agencies, who can be reached through the port district. Copies of the regulations can be obtained from the Chicago Regional Port District, 12800 Butler Drive, Lake Calumet Harbor, Chicago, Illinois 60633. A speed limit of 5 m.p.h. is enforced within the harbor.

Calumet-Sag Channel, Ill.—This channel, connecting the Little Calumet River at Riverdale with the Chicago Sanitary and Ship Canal at the Sag, a distance of 16.2 miles, was constructed by the Sanitary District and became a Federal waterway by act of Congress approved July 3, 1930.

Improvement work has consisted of widening the channel to 225 feet with a project depth of 9 feet. The widening, including the removal of the former Controlling

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Bridges, Etc., Calumet River and Its Branches

No.	Location and name	Kind	Miles from east end of north pier	Draw openings—clear width			Clear height above low-water datum†		Remarks
				Right*	Left*	Center	For 80 feet	Maximum	
	Main River			*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	
1	Overhead wire		0.60					145	
2A	Elgin, Joliet & Eastern Ry	Railway	0.61			200	[2] 7.3	[2] 7.3	Lift.
3	92d St	Highway	.78			180	18.4	19	Bascule.
	Turning Basin No. 1		.94						
4	95th St	Highway	1.12			204	23.7	24.0	Do.
5	Baltimore & Ohio RR bridge	Railway	1.31			135.7	19.0	19.0	Bascule. See Notes 2 and 6.
5A	ConRail	do	1.33			138.2		120.0	Lift. Permanently open.
5B	Overhead wire		1.33					148.0	
6	ConRail	Railway	1.34			138.2	24.1	24.4	Lift. See Note 3.
6A	ConRail	do	1.36			138.2	23.1	24.1	See Notes 2, 3, and 6.
7	Chicago Skyway toll bridge	Highway	1.50			200		125	Fixed truss.
7A	Aerial Cable	Power	1.70					155	
7B	Aerial Cable	do	1.71					155	
8	100th St	do	1.76			186	18.7	18.9	Bascule.
9	106th St	do	2.60			166	19	19.1	Do.
10	Suspension bridge		3.40			(**)		130	Fixed suspension. Pipe and conveyor.
10A	Aerial cable		3.80					144.0	
	Turning Basin No. 3		4.70						
12	Overhead wire		5.32					147.0	
12A	Chi. & West. Ind. RR-Calumet & West RR.	Railway	5.33			200.0	22.5	22.5	Lift. See Note 3.
13	Torrence Ave	Highway	5.34			200	24.3	25.2	Lift. See Note 3.
14A	Norfolk & Western Ry bridge	Railway	5.68			200.0	22.5	22.5	Lift. See Notes 3 and 6.
	Turning Basin No. 5 at "The Forks".		6.14						
	Entrance to Lake Calumet		6.25						
15	130th St	Highway	6.39			219	29.4	29.4	Fixed truss.
16	Overhead wire		6.40					49.4	
17	Overhead wire		6.42					121.1	
19	Chicago, South Shore & South Bend RR.	Railway	6.47			250	29.53	30.1	Fixed span.
20	Thomas J. O'Brien	Lock	6.90		110.0				See Note 5.
	Junction of Calumet River cut-off channel and Little Calumet River.		7.69						
	Little Calumet River—West								
21	Michigan Central	Railway	8.11			250		24.6	Fixed.
22	Calumet Expressway I-94	Highway	8.37			250	39.4		Fixed truss.
23	Overhead wire		10.45					64.4	
24	Chicago & Western Indiana RR.	Railway	10.75			250	24.4	23.4	Do.
25	Overhead wire		11.00					60.0	

See footnotes at end of table.

Bridges, Etc., Calumet River and Its Branches—Continued

No.	Location and name	Kind	Miles from east end of north pier	Draw openings—clear width			Clear height above low-water datum†		Remarks
				Right*	Left*	Center	For 80 feet	Maximum	
	Little Calumet River—West—Continued			*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	
26	Indiana Ave., Riverdale	Highway	11.01			250.0		25.0	Fixed.
27	Overhead wire		11.02					58.0	
28	Aerial cable		11.18					35.0	
29	Illinois Central Gulf RR	Railway	11.20	300	71.4	300		25.0	Fixed truss.
30	Do	do	11.21	300	71.4	300		34.8	Fixed truss. 3 double tracks.
31	Overhead wire		11.33					38.4	
32	Do		12.71					79.6	
34	Penn Central (Penn. RR)	do	12.73			250		24.4	Fixed.
35	Overhead wire		12.74					70.7	
36	Overhead wire		13.01					48.0	
37	South Halsted St	Highway	13.27			226.1		26.4	Fixed truss.
	Calumet-Sag Channel (See separate table for Calumet-Sag Channel).		13.65						Head of navigation on Little Calumet River.
38	Ashland Ave	Highway	14.38	50	50			13.4	Fixed.
38A	Dan Ryan Expressway bridge	do	14.40			145		42.7	Fixed.
39	Riverdale Rd. (Blue Island)	do	14.58			52			Fixed. Site of old stone dam.
	Little Calumet River—East								
40	Torrence Ave	do	7.98			200	29.4	29.4	Fixed truss.
	Junction of Little Calumet and Grand Calumet Rivers.		8.17						
	Grand Calumet [1]								
41	Overhead wire		8.38					61.1	
42	Penn Central (Penn. RR)	Railway	8.85	32.0	(‡)			9.4	Rebuilt as 4 span—Fixed girder.
43	Overhead wire		8.85					61.1	
45	Overhead wire		9.66					61.1	
45A	Burnham Ave., Burnham	Highway	9.67			40.0	25.2		Fixed.
46	Baltimore & Ohio Chicago Terminal RR.	Railway	9.97	53.5	63.1			10.4	Fixed.
47	Overhead wire		9.97					61.1	
48	Indiana Harbor Belt RR	Railway	10.48	(‡)	55			8.1	Do.
	State line, Illinois and Indiana		10.50						
49	Chicago, Indianapolis & Louisville Ry.	Railway	10.71			80		10.2	Bascule.
50	Norfolk & Western Ry	do	10.76	84.6	(‡)			10.6	Swing.
51	Hohman St., Hammond	Highway	10.93						Temporary causeway.

See footnotes at end of table.

Bridges, etc., Calumet River and Its Branches—Continued

No.	Location and name	Kind	Miles from east end of north pier	Draw openings—clear width			Clear height above low-water datum†		Remarks
				Right*	Left*	Center	For 80 feet	Maximum	
	Grand Calumet[1]—Continued			*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	
52	Indiana Harbor Belt RR	Railway	11.18	46	(‡)			8.4	Swing.
53	Sohl Ave	Highway	11.19						Temporary causeway.
54	Calumet Ave., Hammond	do	11.48			66		5.5	Bascule.
55	Columbia Ave	do	11.96						Temporary causeway.
56	Overhead wire	Power	12.17					49.4	
57	Chicago, South Shore & South Bend RR.	Railway	12.60			117		29.5	Fixed girder.
58	Indiana Toll Road Bridge	Highway	12.61			117		29.5	Do
59	Indianapolis Blvd., East Chicago.	do	13.24			41.4		11.1	Do.
	Entrance, Indiana Harbor Canal.		13.86						
60	Indiana Harbor Belt RR	Railway	14.53			14.3		8.5	Fixed trestle.
61	Kennedy Ave	Highway	14.56			12		8.5	Trestle.
62	Do	Electric Ry	14.57			12			Trestle superstructure removed.
63	Chicago, South Shore & South Bend RR. bridge.	Railway	16.28	21	21			11.7	Pile trestle.
63A	Do	Electric Ry	16.29	14	14	14		9.4	Trestle.
64	Cline Ave., Gary	Highway	16.37	17	17	17		10.0	Do.
65	Do	do	16.40			74		22.0	Fixed girder.
66	Elgin, Joliet & Eastern Ry	Railway	16.89	13	13	13		10.0	Pile trestle.
67	Clark Rd	Highway	18.49	24.7	24.7	50		11.1	Fixed girder.
68	Overhead wire	Telephone	18.69					39.5	
69	Pittsburgh, Fort Wayne & Chicago RR.	Railway	18.87			70.3		10.6	Do.
70	Wabash Ry	do	18.91			14		10	Pile trestle.
71	Indiana Toll Road bridge	Highway	19.40						Fixed girder.
72	Ambridge St., Gary	do	20.13			96		10.4	Fixed steel arch.
73	Buchanan St	do	20.84			93		13.1	Do.
74	Indiana Toll Road bridge	do	21.34						Fixed girder.
75	Elgin, Joliet & Eastern Ry	Railway	21.37			31		17.6	Do.
76	Baltimore & Ohio RR	do	21.38	13		60		17.6	Do.
77	Penn Central (NYC RR) bridge.	do	21.40	13		60		17.6	Do.
78	Elgin, Joliet & Eastern (Chicago, Indiana & Southern) Ry.	do	21.42	13		60		17.6	Do.
79	Overhead wire		21.44					80	
80	Broadway, Gary	Highway	22.08			60		18.8	Concrete arch.
81	Virginia St	do	22.49			32		12	Fixed steel arch.
82	Elgin, Joliet & Eastern Ry	Railway	22.74			40		12.6	Fixed girder.
83	Tennessee St	Highway	22.78			41.5		14.8	Do.

See footnotes on next page.

*Right and left refer to sides when going toward Lake Michigan.

†The river surface during dry summers differs only a few inches from lake surface; but in spring and wet seasons the river surface may exceed the lake surface by 1.5 feet at 21 miles on the Grand Calumet, and by 1 foot at the Junction. "Maximum" column shows maximum height for arched or sloping bridges and clear height for full width of level clearances.

**All piers on shore.

‡Not available.

[1] The swing and bascule bridges across Grand Calumet River are not in operating condition.

[2] Vertical Clearance open, 125 feet.

Whistle Signal for Opening Draws (see Regulations below), 3 short (— — —).

NOTE 2.—See 33 CFR § 117.670, (g) Note 1, of Rules and Regulations, preceding.

NOTE 3.—Nos. 6 and 6A are vertical lift bridges. No. 6 is composed of two separate lifts, operated independently with the most lakeward lift in a permanently open position. Nos. 6 and 6A have vertical clearances of 120 feet when up. No. 13 is vertical lift with clearance of 126.4 feet when up. No 12A and 14A are vertical lifts with clearances of 125 feet when up. See § 117.641 as amended in Rules and Regulations, preceding.

NOTE 5.—Three green lights visible through an arc of 360 degrees arranged in a vertical line on the upstream end of the river (guard) wall.

Two green lights visible through an arc of 360 degrees arranged in a vertical line on the downstream end of the river (guard) wall.

A single red light visible through an arc of 360 degrees on each end (upstream and downstream) of the land (guide) wall.

NOTE 6.—Bridge kept in the open position except for the passage of a train.

Works Lock located at the junction with the Little Calumet River, is complete.

Current velocities average 0.2 to 0.4 mile per hour with a maximum of 1.3 miles per hour occurring during periods of heavy runoff.

Navigation Regulations.—See 33 U.S.C. 1, published in Certain Laws, preceding, and 33 CFR § 207.425 of Rules and Regulations, preceding.

Shoal Areas.—For deep draft navigation, the shoal areas between Calumet Harbor and Chicago Harbor extend out from shore 4 miles.

Calumet Bar (Rockefeller Shoal), of sand formation lies with its southerly end 2,400 feet northeast of Calumet Harbor Light. It is about 4,500 feet long north and south and about 1,200 feet in greatest width, with controlling depths of 21 to 24 feet. A buoy marks the easterly end of a 21-foot area on the bar.

Wreck.—The wreck of the Motorship *Material Service*, 240 feet by 40 feet in size and marked on the east by a buoy, lies in about 31 feet of water with least depth of 14 feet over it, almost 2,080 feet 012° from Calumet Harbor Light. Mariners should exercise due care in the vicinity.

Clarke Point Shoal extends ⅞ mile northeasterly from shore about 1 mile northerly of Calumet breakwater, has limiting depths of 5 to 9 feet, and is marked at its outer end by a buoy.

Wreck.—The wreck of the tug *Tacoma* lies 1.1 miles 152° from Sixty-eighth Street crib, 0.7 mile northeasterly from Clarke Point Shoal buoy, and 2.66 miles 343° from Calumet Harbor Light, in about 30 feet of water and with a least depth of 20 feet over it.

Chicago South District Filtration Plant and Rainbow Park Beach.—The city of Chicago has completed a bathing beach and a filtration plant on land made by bulkheading and filling an area of about 149 acres extending north from Seventy-ninth Street to Seventy-fifth Street. The filtration-plant area proper and the breakwater protecting it center on a line north of Cheltenham Place extended. The breakwater is of rubble mound rising 7.9 feet and consists of two arms diverging on an angle of 132°38′, with apex 935 feet lakeward of the east wall of the filtration-plant bulkhead or about 3,035 feet from the former shore line. From the apex the southerly arm extends approximately 1,180 feet 166° and the other arm 1,480 feet 298°33′. The east wall of the bulkhead, which incloses the filtration-plant area 1,050 feet and 1,600 feet long, is about 2,100 feet lakeward of the former shore line.

The waters between the northeasterly bulkhead of the Chicago South District Filtration Plant and the breakwater sheltering the plant, and the waters for a distance of 150 feet off the southeasterly side of the plant have been designated as a "No Mooring-Restricted Area", and all boat owners are requested to discontinue the practice of mooring in this area.

The filtration-plant breakwater is marked at its southerly end by a light and at its northerly end by a light, maintained by the city of Chicago during the navigation season.

From the filtration-plant area north to Seventy-fifth Street, the lake has been filled in behind a submerged dike to form a bathing beach. The dike, about 2,100 feet long and with top submerged to a depth of 6.6 feet, extends parallel to shore from a rubble-mound jetty located on the east line of the filtration-plant area to the extremity of a rubble-mound jetty extending 500 feet lakeward from the present shore line at Seventy-fifth Street.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 CFR § 1250.93 of Rules and Regulations, preceding. Sixty-eighth Street crib lies 1.94 miles 080° from the light on the angle of Casino Pier at Jackson Park and 3.6 miles 357° from Calumet Pier-

Bridges, etc., Calumet-Sag Channel

No.	Location and name	Kind	Miles from east end of north pier, Calumet Harbor	Channel spans—clear width	Clear height above low-water datum	Remarks
				Feet	*Feet*	
	Junction with Little Calumet River—West		13.65			
1	Ashland Avenue	Highway	14.4	*223.5	26.4	Fixed.
2	Dan Ryan Expressway I-57	do	14.7	225	41.3	Do.
4	Blue Island—Division Street	do	14.9	225	24.50	Do.
5	Blue Island—Chatham Street	do	15.2	*225	24.5	Do.
6	Blue Island—New Western Avenue	do	15.4	*228	44.7	Do.
7	Blue Island—Chi., Rock Is. & Pacific Ry	Railway	15.4	225	24.7	Do.
8	Chi., Rock Isl. & Pacific Ry	do		225	26.1	Do.
10	B. & O.—C.T. RR	do	15.8	225	24.38	Do.
11	G.T.W. Ry	do	15.8	225	24.4	Do.
12	G.T.W. Ry	do	15.8	225	24.6	Do.
13	Blue Island—Baltimore & Ohio RR-C.T. RR-I.H.B. RR.	do	15.8	225	24.38	Do.
14	C.R.I. & P.—G.T.W. RR	do	15.8	225	24.38	Do.
15	Francisco Avenue bridge	Highway	16.0	225	24.38	Do.
16	Kedzie Avenue	do	16.4	225	24.38	Do.
17	Crawford Avenue	do	17.4	*198	26.4	Do.
18	Northern Illinois Toll—Twin Bridges	do	17.8	225	39.8	Do.
19	Cicero Avenue	do	18.5	198	24.5	Do.
20	One Hundred and Twenty-seventh Street	do	19.2	225	24.38	Do.
21	Ridgeland Avenue	do	20.9	225	24.4	Do.
22	Harlem Avenue	do	21.9	225	24.4	Do.
23	Norfolk & Western Ry. (near Worth)	Railway	22.6	225	43.1	Do.
24	Southwest Highway	Highway	22.7	188.5	26.4	Do.
25	Ninety-sixth Avenue	do	25.0	225	24.63	Do.
26	104th Avenue	do	26.0	225	24.38	Do.
27	Sag Highway	do	29.2	*250	39.4	Do.
28	G.M. & O. RR	Railway	29.5	*225	24.38	Do.
	Chicago Sanitary and Ship Canal		29.9			

*Usable width is restricted to that of channel as described above.

head Light; it has a light and an automatic fog bell maintained by the city of Chicago.

Edward F. Dunne crib, about 109 feet in diameter and 30 feet high, is located about 11,000 feet from the shore in line with Seventy-third Street extended and with its center about 225 feet southerly of Sixty-eighth Street Crib Light. The two cribs are connected by a steel bridge about 27 feet above the water, with a clear width of about 45 feet between the Dunne crib and the breakwater surrounding the Sixty-eighth Street crib. White electric lights on the bridge between the two cribs are shown at night throughout the year.

Submarine Cables.—A submarine high voltage cable and a telephone cable extend from the Dunne crib westerly about on a straight line to shore at the foot of Sixty-seventh Street. Vessels dropping anchor should avoid the cables.

Jackson Park Harbors and Lagoons.—Jackson Park, about 6¾ miles south of the mouth of Chicago River, has two entrances into its lagoons. The northerly entrance, known as Fifty-ninth Street Harbor, about 1,900 feet south of the north boundary of the park, has two steel sheet pile piers about 100 feet apart. The northerly pier, marked at its outer end by a light, is about 525 feet long, the southerly pier about 550 feet, with a boat channel about 5 feet in depth between them. The harbor inside is dredged to accommodate small boats of not over 20 feet length and 2 feet draft. A highway bridge with a vertical clearance of about 10 feet is built across the channel at the inner end of the piers.

The southerly entrance, known as Jackson Park Yacht Harbor, about 3,200 feet farther south, is protected on its north side by the Casino Pier, which extends easterly a distance of 1,400 feet to an angle, and thence 1,100 feet

northerly. The angle and the outer end of the pier are each marked by a light on a skeleton tower. The shore end of the pier is also marked by a light. The lights are maintained by the Chicago Park District from March 31 to December 1 each year. On the north side of the pier, in the angle between it and the shore, there is a bathing beach, the Pier serving to retain the sand of the beach. The south bank of the entrance, which is short, is a granite wall, carrying a light. The entrance itself has a width of about 200 feet, a channel depth of about 6 feet, and leads directly into a lagoon which here forms a yacht harbor. Inside the harbor, the depths vary from 6 to 10 feet with shoaling to less than 6 feet within 150 feet of the shore line, the greater depth being maintained throughout the channel and in the central part of the harbor in which numerous anchorages for small craft are maintained by the Chicago Park District. An inner lagoon, with controlling depth of 7 feet and providing further dockage and mooring area, is connected to the outer lagoon by a narrow channel 6 feet deep, passing under a highway bridge with 14 feet vertical clearance. A rubble-mound sea wall, with top about 6 feet above the water extends along the park shore from the south side of the harbor entrance to Sixty-seventh Street.

Hyde Park, Madison Park, and South Park Shoals.—Hyde Park Inner Shoal lies ⅜ mile east of the outer end of Morgan Shoal and has least depth of 11 feet. Hyde Park Outer Shoal is 2¼ miles offshore, about in line with Morgan and Hyde Park Inner Shoals; it has least depth of 8 feet and is marked on its north side by a buoy. Madison Park Shoal, with 13 feet least depth, is 1¼ miles from shore and ¾ mile southeasterly from Hyde Park Inner Shoal. South Park Shoal lies 1¾ miles offshore and is ⅝ mile southeasterly from Madison Park Shoal and ⅝ mile southerly of Hyde Park Outer Shoal; it has 7 feet least depth, and a buoy is moored on its east side.

Clemson Shoal is an area of ledge rock about 8,000 square feet in size, located 2,300 feet easterly from Hyde Park Shoal buoy, having average depth of 20 feet and least depth of 18 feet. A buoy marks the easterly or lakeward edge of the shoal.

Oakland and Morgan Shoals.—Oakland Shoal is a spit with 7 feet least depth, extending ¾ mile from the shore 4½ miles south of the Chicago River entrance. About 1 mile southeasterly from Oakland Shoal, Morgan Shoal reaches ¾ mile offshore with depths of 2 to 6 feet; a buoy marks the east edge of this shoal. The water is also shallow west of Oakland and Morgan Shoals.

Wreck.—The remains of the small passenger steamer *Silver Spray* lie in about 5 feet of water on Morgan Shoal, about 500 feet northeast of 49th Street beach. There is a depth of 1.3 feet over the highest part of the wreck.

Burnham Park Yacht Harbor, sheltered by Northerly Island, and with an area of about 80 acres, extends from Thirteenth Street to the foot of Twenty-second Street. The north end of the harbor is closed by a causeway connecting the island with the mainland. The entrance is at the southerly end of the harbor and has a width of 200 feet and a depth of about 16 feet. A sandy shoal having about 9 feet of water over it is located 1,500 feet inside the harbor entrance and 300 feet off the east shore. The remainder of the harbor has controlling depths as follows: 15 feet through the middle of the harbor for almost its entire length; 7 feet along the west side from the harbor entrance to the finger docks south of Waldron Drive; and 10 feet along the finger docks on west side of harbor north of Waldron Drive with 13 feet diminishing rapidly towards shore on the east side. Moorings and stalls to accommodate yachts up to 100 feet in length are maintained by the Chicago Park District. Vessels should not moor along the bulkheads. The entrance to the harbor is marked by the Burnham Park Harbor Light maintained by the Chicago Park District on a white skeleton tower on the mainland at the foot of 23d Street. The light shows green and also a red sector (135° to 255°) to a vessel in Lake Michigan north of the south tangent of Northerly Island whose course to the harbor entrance is obstructed by the low land of Northerly Island.

Northerly Island.—The Chicago Park District has bulkheaded and filled an extensive area of the Lake Michigan frontage between Jackson Park and the Chicago Harbor Inner Basin, including the construction of Northerly Island located outside of the bulkhead from Roosevelt Road (1200 south) to Cermak Road (2200 south) and occupied by Merrill C. Meigs Field (airport) on the southerly part and the Adler Planetarium on the northeast part of the island. Access to the island is over a causeway from the mainland to the island north end. Vessels should not attempt to enter the bathing beach area on the east side of the island south of the Adler Planetarium because of submerged piling on line with bulkhead piling northward and southward of the beach area.

Danger Zone Regulations.—See 33 U.S.C. 1, published in Certain Laws, preceding, and 33 CFR § 204.180 of Rules and Regulations, preceding.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 CFR § 1250.93 of Rules and Regulations, preceding. Four-Mile Crib and Vicinity.—Four Mile crib, located 2.6 miles 115°30′ from Chicago Harbor Lighthouse, carries a light and a fog bell.

Submarine Cables.—A submarine power and telephone cable extends from Chicago Harbor Light southward across the harbor entrance and along the west side of the south arm of the outer breakwater to the South End Light, and thence lakeward on a direct line to Four-Mile crib. Also a submarine telephone cable extends northwesterly from Four-Mile crib to the Harrison crib. Mariners are cautioned to keep clear of the cables when necessary to drop anchor.

A rock pile with 19 feet over it lies 4,700 feet southeast of Chicago Outer Breakwater South End Light. In the area along the shore south of Chicago Harbor, westward of a line in southerly prolongation of the outer breakwater, the bottom is characterized by scattered lumps and shoals over which the controlling depths are from 10 to 15 feet.

Dumping Ground.—Chicago Harbor Outer Lighted Bell Buoy 1, black, showing a green flash, is equipped with radar reflectors and is moored in about 60 feet of water off Chicago Harbor to mark a point 7¼ miles 072° from

Chicago Harbor Light. An act of Congress prohibits the dumping of refuse within 8 miles from shore.

Dumping Grounds Regulations.—See 33 U.S.C. 407, 419 and 421, published in Certain Laws, preceding, and 33 CFR § 205.40 of Rules and Regulations, preceding.

Waterways From Lake Michigan to Mississippi River—(Illinois Waterway).—In the Chicago area, channels constructed by the Sanitary District, together with improvements made in the Chicago, the Calumet, and the Little Calumet Rivers, have provided connections for the navigable routes from Lake Michigan to the Mississippi River. From Chicago Harbor the Chicago River main channel and South Branch, and from Calumet Harbor the Calumet and Little Calumet Rivers and Calumet-Sag Channel, connect with the Chicago Sanitary and Ship Canal, which in turn connects at Lockport with the Des Plaines River. Thence the route follows the Des Plaines River to the head of the Illinois River, and via the latter to the Mississippi River at Grafton, Ill.

Federal Jurisdiction.—These waterways are under Federal jurisdiction and free to the use of the public as governed by the laws and regulations relating to navigation and the use of navigable waters in general.

Water Diversion From Lake Michigan.—The State of Illinois is authorized by a United States Supreme Court decree to divert 3,200 cubic feet per second of water from Lake Michigan through the above-mentioned channels.

As a result of this diversion, the flow is normally away from the lake.

Channels and Distances.—The principal channels and routes of this system of waterways and the distances from Lake Michigan are as follows:

General Channel Conditions.—The Chicago and Calumet Rivers are navigable for lake vessels to the extent described in the text under the applicable headings, and the Chicago Sanitary and Ship Canal for tugs and deep-draft barges, such as can pass under the bridges, throughout its length.

The controlling depths are as here stated in each of the following channels: About 9 feet in the Calumet River south of turning basin No. 5, the Little Calumet River, the Calumet-Sag Channel, and the Des Plaines and Illinois Rivers; and in 1971 about 6 feet in the North Shore Channel.

The minimum controlling horizontal clearance, normal to the channel, is 80 feet at the butterfly dam in the Chicago Sanitary and Ship Canal.

Minimum vertical clearances are 17.0 feet in the Chicago Sanitary and Ship Canal, 18.4 feet in the Little Calumet River; and 24.4 feet in the Calumet-Sag Channel (see bridge tables herein). These clearances may at times be reduced as much as 3 or 4 feet or more by high water.

The seven locks in the Des Plaines and Illinois Rivers are each 600 feet long and 110 feet wide in the clear, or for square-ended craft. The lock in the Calumet River is 1,000 feet long and 110 feet wide. The lock in the North Shore Channel, at Wilmette, is 140 feet long and 30 feet wide, but is inoperative and is closed to all navigation.

Special restrictions are in effect concerning all locks and dams of the Illinois Waterway and the lock of the Sanitary District at the mouth of the Chicago River. The restrictions are as follows: Boat crews, repair men, and company officials will be permitted to embark or disembark at the above locations only after identification has been established satisfactory to the lockmaster. Such identification can be established by the vessel master or pilot on duty personally signing a Necessity for Admission form which will be furnished by the lockmaster. The privilege of entering the lock premises is for the express purpose only of embarking or disembarking from a vessel, and shall not be construed as permission to use the reservation for waiting or any other purpose. Supplies, packages, and parcels, including laundry, will not be accepted by the lockmaster for delivery to or from vessels.

Navigation Charts.—Charts of the Illinois Waterway is a booklet of charts showing this maintained waterway from the Mississippi River at Grafton, Illinois to Lake Michigan at Chicago, Illinois. The booklet is published and may be obtained from the Corps of Engineers District, Chicago. (See appendix for address.) A strip map in two sheets showing the waterway, may be obtained free of charge.

Light List.—Aids to navigation for the Chicago Sanitary and Ship Canal, the Calumet-Sag Channel, the Des Plaines and Illinois Rivers, are contained in the publication "List of Lights and Other Marine Aids, Volume V, Mississippi River System, CG-161", which may be obtained from the Superintendent of Documents, Washington, D.C.; and the Commander, Second Coast Guard District, Old Customhouse, St. Louis, Mo.

Charts 14905, 14926, 14927, 14928.—Chicago Harbor, Ill.—This harbor is located at the mouth of Chicago River, about 22 miles from the southerly end of the lake.

Channels.—The harbor consists of an outer harbor of refuge protected by breakwaters on the northeast and east sides and an inner basin protected by breakwaters and bulkheads. The outer harbor is entered from Lake Michigan through a dredged entrance channel leading westward through the east breakwater. The outer harbor affords access to the municipal pier on the west side of the harbor and to the entrance channel to the inner basin. A small-craft basin, protected by two inner breakwaters, is entered about 1.1 miles southwest of the outer harbor basin. The inner basin, on the south side of the mouth of Chicago River, is entered from the west side of the outer harbor through a lock in the jettied channel. The inner basin and the river may only be entered through the lock, as a bulkhead extending from the shore to the inner breakwater separates the inner basin from the small-craft basin southwest of the outer harbor. The dredged river entrance channel extends from the lock across the north

Channels and Distances Table

No.	Name of channel	Length of connecting channel	From lake shore, Wilmette Harbor*	From east end of north pier, Chicago Harbor	From east end of north pier, Calumet Harbor
		Miles	*Miles*	*Miles*	*Miles*
1	North Shore Channel—From Wilmette Harbor	8. 1			
	To connection with North Branch of Chicago River		8. 1	9	59. 3
2	Chicago River, North Branch—From North Shore Channel	7. 3			
	To junction of branches and main channel		15. 5	1. 6	52
3	Chicago River, Main Channel—From junction of branches	1. 6			
	To east end of north pier, Chicago Harbor		17		53. 6
4	Chicago River, South Branch—From junction of branches	3. 9			
	West Fork of South Branch	. 6			
	To connection with Sanitary and Ship Canal (No. 8-1)		20	6. 1	47. 5
5	Calumet River—From east end of north pier, Calumet Harbor	7. 7	67. 5	53. 6	
6	Little Calumet River—West from Calumet River cutoff channel	6	59. 8	45. 9	7. 7
7	Calumet-Sag Channel—From Little Calumet River connection	16. 2	53. 8	39. 9	13. 7
	To connection with Sanitary and Ship Canal (No. 8-b)		37. 6	23. 7	29. 9
8	Chicago Sanitary and Ship Canal:				
	(a) From West Fork of South Branch, Chicago River (No. 4)	30			
	(b) From Calumet-Sag Channel connection (No. 7)	12. 4			
	To connection with Des Plaines River, Lockport Lock		50	36. 1	42. 3
9	Des Plaines River—From Lockport Lock	18. 1			
	To head of Illinois River		68. 1	54. 3	60. 5
10	Illinois River—From head of river	272. 9			
	To mouth at Mississippi River		341. 1	327. 2	333. 4
11	Illinois River—From head of river	62. 7			
	To connection of Illinois and Mississippi Canal (No. 12)		130. 9	117	123. 2
†12	Illinois and Mississippi Canal—From Illinois River	75			
	To Mississippi River at mouth of Rock River		205. 9	192	198. 1

*The Metropolitan Sanitary District of Greater Chicago lock at Wilmette Harbor is not operated for navigation.

†As of 1 July 1951, operation of the lock on the Illinois and Mississippi (Hennepin) Canal and maintenance of the Canal was discontinued.

side of the inner basin through the mouth of the river upstream to Rush Street.

Depths in the inner basin and river entrance shoreward of the Sanitary District lock are referred to normal pool level, which is 0.6 foot below Low Water Datum, the plane of reference used in the outer harbor and elsewhere on Lake Michigan.

In 1973, the controlling depths were 29 feet in the lake approach channel, thence 28 feet in the outer harbor basin except for minor scattered shoaling, thence 21 feet from the outer harbor to the lock, thence 21 feet at midchannel from the lock through the mouth of the river upstream to Rush Street. The inner basin has depths of 10 to 21 feet.

In 1961, the controlling depth in the slip extending from the outer harbor basin along the south side of Navy Pier was 27 feet.

Navigators are cautioned against navigating outside the channel limits in the vicinity of structures protected by stone riprap.

Anchorages.—General and small-craft anchorages are in Chicago outer harbor and in the small-craft basin at the southwest corner of the outer harbor. (See 33 CFR 110.1, 110.83, and 110.205 of Rules and Regulations, preceding.)

Municipal Piers.—Plans for the city's outer harbor contemplated the construction of five piers for the accommodation of freight and passenger traffic. The structures which have been built are described below.

Pier No. 1, a low rock filled pile pier, at present consists of the south wall of the proposed pier; is about 2,335 feet long, located 472 feet south of and parallel to Pier No. 2 and is detached from the shore, its west end being 350 feet east of the shore line. Its outer end is marked by a light.

Pier No. 2, or Navy Pier, extends 3,000 feet east of the shore at Grand Avenue and is the only one completed. A new concrete deck extension 96 feet wide and extending about 2,340 feet east of the shore line has been constructed along its south side. The outer end is marked

at the southeast corner by a light 2,350 feet 290° 30′ from Chicago Harbor Light.

Submarine Cable.—The city maintains a submarine cable to supply current for the light at the east end of Pier No. 1 from Pier No. 2. The cable extends to Pier No. 1 on the bed of the slip about 660 feet west of the east end of Pier No. 2. Vessels should not drop or drag anchor in the vicinity of the cable.

Central District Filtration Plant.—In an area extending from about 350 feet north to about 1,500 feet north of the north side of Pier No. 2, and extending about 2,800 feet west of a line lying about 875 feet west of the east end of Pier No. 2, the City of Chicago has completed construction of dike type, stone faced, retaining walls along the westerly, north, and east sides of the area and a cellular type retaining wall along the south side of the area. The inclosed area has been filled and the city's new filtration plant was constructed thereon. Chicago Harbor Filtration Plant Light B marks the southeast area of the retaining wall and Chicago Harbor Filtration Plant Light A marks the northeast corner of the retaining wall.

Outfall Pipeline.—An 84-inch outfall pipeline, completed in 1963, extends from the North Central Section of the Central District Filtration Plant, northeasterly under the bed of the harbor and through the exterior U.S. Government Breakwater into Lake Michigan.

Fish Nets.—In 1967, the Department of Public Works, city of Chicago, Ill., installed approximately 1,990 lineal feet of fish nets on the north side of the Central District Filtration Plant opposite the mid point of the main structures. The fish nets, enclosing a triangular area extending approximately 325 feet north of the wall, are held in place by thirteen anchors on cables extending a maximum of 200 feet beyond the nets. The nets are floodlighted and marked by private lighted buoys.

Randolph Street Slip, located in the southwest corner of the river entrance basin is about 850 feet long and 74 feet wide. In 1974, depths of 8 feet or more were reported in an area 40 feet wide on the south side of the slip adjoining the U.S. Naval Reserve Center.

Ogden Slip, is located north of the river entrance channel and approximately parallel thereto. The present length of the slip is about 2,400 feet, and the width varies from about 98 feet at the west end to about 140 feet at the east end, except in the draw of the Outer Drive Bridge where the width is reduced to 70 feet. Check soundings completed 1971 on the center line of the slip, showed depths of 14 feet or more to within about 400 feet of the west end of the slip; thence, depths gradually increased to about 18 feet at the west end.

Aids to Navigation.—Two buoys, located about one mile east of Chicago Harbor Light, mark the edges of the channel leading into Chicago Harbor.

Chicago Harbor Light is located at the south end of the north arm of the exterior breakwater extension, north side of the main harbor entrance; an air fog diaphragm horn and a radiobeacon are operated at this station, and the station has long-distance telephone connection.

Chicago Harbor Entrance South Side Light marks the north end of the south arm of the breakwater extension, on the south side of the main entrance opposite the harbor light. Outer Breakwater South End Light marks the south end of the south arm of the breakwater.

Chicago Breakwater South Light is located on the south end of the main inner breakwater, at the north side of the entrance to the inner basin.

Southeast Guide Wall Light is on the east end of the guide wall at the lock of the Sanitary District controlling works; a diaphragm fog horn sounds continuously.

Chicago Outer Breakwater Northwest End Light marks the inshore end of the old exterior breakwater and the east side of the 400-foot opening between the exterior breakwater and the shore-arm extension.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Chicago, Ill. is contained in the **Port Series No. 46** (Revised 1961) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Marine Weather Broadcasts.—The National Weather Service provides continuous weather broadcasts on a frequency of 162.55 mHz, with a power of 250 watts from Radio Station KWO-39. The station is located in the National Weather Service Forecast Office, 1819 West Pershing Road, Chicago, Ill. 60609, and has an approximate radius of 50 miles for reception. Information in the broadcast includes the Lake Michigan forecasts and warnings throughout the year, recreational boating forecasts and warnings along the Illinois-Indiana shoreline May through October, midwest and Chicago area forecasts, wind and weather from Meigs Field and Fort Sheridan, and wind, weather, and wave information from the 68th Street Crib, Chicago, from Michigan City, Ind., and from St. Joseph, Mich., also Chicago weather radar reports.

Coast Guard Station.—U.S. Coast Guard Air Station, Chicago, is at Glenview, Ill., about 17 miles northwest of the mouth of the Chicago River and about 7½ miles west of Wilmette Harbor. The air station supports Coast Guard surface operations, carries out search and rescue missions, and renders airborne assitance. The air station can be contacted through the nearest Coast Guard station.

Captain of the Port Areas.—See **33 CFR § 3.45-60** of Rules and Regulations, preceding.

Anchorage Regulations.—See **33 U.S.C. 471** of Certain Laws, preceding, and **33 CFR § 110.1, 110.83 and 110.205** of Rules and Regulations, preceding.

Navigation Regulations.—See **33 U.S.C. 1** of Certain Laws, preceding, and **33 CFR § 207.420** of Rules and Regulations, preceding.

Pilotage Regulations.—See **46 U.S.C. 216-2161** published in Certain Laws, preceding, and **46 C.F.R. § 401** (in part) of Rules and Regulations, preceding.

Pilot Dispatch Offices.—The Lakes Huron, Michigan,

and Superior, and St. Marys River, in Great Lakes Pilotage District No. 3 are serviced by the following dispatch offices:

Lakes Pilots Association
P.O. Box 902
Port Huron, Michigan
313-984-2541

Upper Great Lakes Pilots, Inc.
802 Garfield Avenue
Duluth, Minnesota 55802
218-722-1425

Upper Great Lakes Pilots, Inc.
De Tour, Michigan
906-297-5111

Upper Great Lakes Pilots, Inc.
Chicago, Illinois
312-734-6311

Upper Great Lakes Pilots, Inc.
Milwaukee, Wisconsin
414-383-5546

For vessels requiring pilotage service, the nearest pilot dispatch office is notified 12 hours ahead with a follow-up confirmation 4 hours in advance.

Chicago River, Ill.—The river constitutes the inner harbor of Chicago. The navigable portions are wholly within the limits of Cook County and of the city of Chicago. The main channel divides into the North and South Branches about 1.58 miles from the east end of the north pier, and South Fork branches from South Branch about 4 miles farther from the lake. The total length of the main river and branches is about 17 miles. Sanitary District improvements have reversed the natural flow of the river, except in the North Branch, and it is now away from the lake.

Sanitary District Controlling Works.—At the mouth of the Chicago River, the Sanitary District has constructed controlling works to prevent the flow of the river into the lake. These works comprise a navigation lock located about 40 feet south of the centerline of the river entrance channel and about 1,800 feet east of the Outer Drive Bridge, with a lock and guide wall parallel to the municipal piers; a wall extending across the river entrance from the west end of the north wall of the lock northerly to the east end of the north pier, thus closing the river entrance to navigation except through the lock; and a wall extending from the south line of Randolph Street easterly to the inner breakwater and separating the two basins above described.

Under 33 U.S.C. 1 of Certain Laws, preceding, and 33 CFR § 207.420 of Rules and Regulations, preceding, the water level landward of the lock is maintained at a normal pool level of 0.6 foot below the plane of reference used in the outer harbor and elsewhere on Lake Michigan and 2 feet below Chicago City Datum, except in times of excessive storm runoff into the river when the level may rise several feet.

The lock, which is operated under the same regulations as noted above, is 80 feet by 600 feet in the clear and has a depth of 23 feet over the sills. The south lock wall is extended 700 feet eastward to form the southeast guide wall, and 600 feet westward to the north end of the inner breakwater to form the southwest guide wall. The zero of gages set in the lock walls is at Chicago City Datum, which is 1.4 feet above the Federal improvement plane of Low Water Datum. A sound amplifier system controlled by the lock operators affords speaking communication between the operators and navigators.

Sanitary District Controlling Works—Special Signal for Mooring to North Lock Wall.—Shipmasters are informed that if they wish to use the north lock wall for mooring their vessels under adverse conditions such as strong southerly winds, they should so indicate by 2 long blasts of the whistle, following by about one-half minute after the regular lockage signal of 2 long and 2 short blasts (see par. 4 of 33 CFR § 207.420 of Rules and Regulations, preceding). Vessels are required to give the signal for lockage at a distance from the lock of not more than 4,000 feet when inbound and 2,000 feet when outbound. If the above special signal request is made, men will be placed on the north wall to take lines; otherwise it is to be understood that the lockmen will be on the south wall to take lines.

Submarine Tunnels.—There are tunnels under the river, with their tops submerged to depths as follows: At State Street, 26.9 feet; at LaSalle Street, 25 feet; at Lake Street, 41.3 feet; at Washington Street, 25.1 feet; at Van Buren Street, 25.6 feet; at Congress Street, 40.8 feet; on the North Branch at Kinzie Street, 49.0 feet; at Division Street, 45.8 feet; and at Blackhawk Street, 48.7 feet.

Channels.—The Federal project provides for dredged channels in the Chicago River from its mouth to the junction with the North and South Branches, thence in North Branch and North Branch Canal to the turning basin at North Avenue.

In 1973, the midchannel controlling depths were 21 feet in the Chicago River from Michigan Avenue bridge to North Branch, thence in 1976, 21 feet in North Branch to Ogden Avenue bridge, thence 18 feet to Division Street bridge, thence 17 feet to the turning basin at North Avenue bridge with 13 feet in the basin except for shoaling along the edges. In 1976, the midchannel controlling depths in North Branch Canal were 15 feet from the south end to Division Street bridge, thence depths decreasing from 10 to 7 feet to the turning basin.

The city of Chicago has improved the channel in North Branch north of the turning basin at North Avenue bridge. In 1966, the midchannel controlling depth was 9 feet from the turning basin upstream to Addison Street bridge. In 1957, the channel from Addison Street bridge to Foster Avenue, just inside the south end of North Shore Channel, was dredged to a depth of 8 feet.

The city of Chicago has also improved the channel in South Branch to the South Damen Avenue bridge, includ-

Bridges, etc., Across Chicago River and Its Branches

	Location and name	Kind	Miles from east end of north pier	Draw openings—clear width			Clear height above low-water datum		Remarks
				Right*	Left*	Center	For 80 feet width	Maximum†	
	Main River			*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	
	Ogden Slip‡		0.21						
1	Lake Shore Drive	Highway	.33			210.0	25.5	25.5	Bascule.
2	Lake Shore Drive (over Ogden Slip).	do	.46			70.0		23.6	Fixed.
3	Michigan Ave	do	.87			195.0	17.9	17.9	Double-deck bascule. See Note 5.
4	Wabash Ave	do	1.01			192.0	22.1	23.6	Bascule.
5	State St	do	1.07			200.0	21.4	21.4	Do.
5A	Do	Subway tunnels	1.07						At depth of 26.9 feet.
6	Dearborn St	Highway	1.16			200.0	22.4	22.4	Bascule.
7	Clark St	do	1.23			195.0	19.7	20.3	Bascule. See Note 5.
8	La Salle St	do	1.31			195.0	18.6	19.2	Do.
8A	Do	Tunnel	1.31						At depth of 25 feet.
9	Wells St	Highway and elevated railway.	1.38			219.5	18.6	18.6	Double-deck Bascule. See Note 5.
10	Franklin-Orleans St	Highway	1.46			190.0	18.9	19.4	Bascule. See Note 6.
	South Branch		1.58						
11	Lake St	Highway and elevated railway.	1.65			206.8	18.8	18.9	Double-deck bascule. See Note 5.
11A	Do	Subway tunnels	1.65						At depth of 41.3 feet or more.
12	Randolph St	Highway	1.74			134.0	17.3	18.7	Bascule.
13	Washington St	do	1.82			155.4	20.7	21.4	Bascule. See Note 6.
13A	Do	Tunnel	1.82						At depth of 25.1 feet.
13B	Madison St	do	1.90						At depth of 46.6 feet.
14	Do	Highway	1.91			172.7	18.9	19.1	Bascule. See Note 6.
15	Monroe St	do	2.00			156.0	18.8	19.4	Do.
16	Adams St	do	2.09			148.9	19.1	22.3	Do.
17	Jackson Blvd	do	2.18			143.1	20.5	23.6	Do.
18	Van Buren St	Tunnel	2.24						At depth of 25.6 feet.
19	Do	Highway	2.27			166.0	22.8	22.8	Bascule. See Note 6.
20	Eisenhower Expressway	do	2.36			168.0	22.4	22.4	Double-span bascule.
21	Harrison St	do	2.45			159.0	22.6	23.3	Bascule. See Note 6.
22	Polk St	do	2.61			130.0			See Note 4.
23	Roosevelt Rd	do	2.94			158.7	25.4	26.3	Bascule. See Note 6.
24	Baltimore & Ohio Chicago Terminal R.R.	Railway	3.36			171.0	21.5	23.0	Do.

See footnotes at end of table.

Bridges, etc., Across Chicago River and Its Branches—Continued

No.	Location and name	Kind	Miles from east end of north pier	Draw openings—clear width			Clear height above low-water datum		Remarks
				Right*	Left*	Center	For 80 feet width	Maximum†	
	South Branch—Con.			*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	
25	Northern and Illinois Central R.R. (St. Charles Air Line).	Railway	3. 37			200. 0	22. 9	24. 0	Bascule.
26	18th St	Highway	3. 59			125. 0	22. 3	22. 3	Bascule. See Note 6.
27	Penn Central (Pitt., Ft. Wayne & Chi.)	Railway	3. 77			156. 0		10. 5	See note 1. Leased to Penn Cent.
28	Canal St	Highway	3. 88			167. 0	22. 4	22. 4	Bascule. See Note 6.
29	Cermak Rd	do	4. 04			129. 6	14. 8	17. 1	Bascule.
29a	Dan Ryan Expressway	do	4. 35			170. 0	64. 4	64. 4	Fixed girder
30	South Halsted St	do	4. 47			163. 8	21. 5	22. 1	Bascule. See Note 6.
31	South Throop St	do	5. 08			131. 5			Bridge removed. Abutments remain.
32	South Loomis St	do	5. 29			144. 0	22. 4		Bascule. See Note 6.
	Turning basin		5. 51						
	West Fork of South Branch		5. 51						
33	South Ashland Ave	Highway	5. 59			183. 0	21. 6	22. 4	Bascule. See Note 6.
34	South Damen Ave	do	6. 14			140. 3	27. 2	27. 4	Do.
	Chicago Sanitary Canal		6. 14						
	Turning basin		6. 19						
	1,300 ft. east of center line of South Western Ave.		6. 39						Head of navigation.
	South Fork of South Branch		5. 51						
35	Illinois Central Gulf RR.	Railway	5. 79			92. 8	17. 8	17. 8	Bascule. Fixed girder.
35A	Adlai E. Stevenson Expressway.	Highway	5. 84			90. 0	31. 0	31. 0	Fixed girder.
36	Archer Ave	do	5. 88			90. 0	17. 4	17. 4	Fixed girder.
37	35th St	do	6. 55			121. 7	12. 1	12. 1	Fixed.
			6. 93						Head of navigation.
	North Branch		1. 58						
39	Chicago & North Western Ry.	Railway	1. 77			105. 0	6. 5	6. 6	Bascule. See Note 7.
40	Kinzie St	Highway	1. 82			100. 0	13. 7	14. 9	Do.
42	Grand Ave	Highway	2. 00			120. 8	18. 3	18. 9	Bascule. See Note 6.
43	John F. Kennedy Expressway Feeder.	do	2. 11			138. 5	31. 6	33. 4	Double-span bascule.
44	Erie St	Highway	2. 21			131. 6			See Note 4.
45	Chicago Ave	do	2. 40			148. 8	18. 5	19. 0	Bascule. See Note 5.
	North Branch Canal (south entrance).		2. 50						

See footnote at end of table.

Bridges, etc, Across Chicago River and Its Branches—Continued

No.	Location and name	Kind	Miles from east end of north pier	Draw openings—clear width			Clear height above low-water datum		Remarks
				Right*	Left*	Center	For 80 feet width	Maximum†	
	North Branch—Con.			*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	
46	North Halsted St	Highway	2. 64			140. 0	22. 4	23. 0	Bascule.
47	Ogden Ave	do	2. 87			138. 0	20. 1	20. 3	Bascule. See Note 5.
48	Division St	do	3. 32			91. 6	18. 1	18. 2	Bascule. See Note 6.
	Turning basin		3. 71						
	North Branch Canal (north entrance).		3. 83						
49	North Ave	Highway	3. 84			125. 0	18. 1	18. 4	Fixed.
50	Chicago, Milwaukee, St. Paul & Pacific RR.	Railway	4. 43			82. 7	9. 5	10. 3	Bobtail swing.
51	Cortland St	Highway	4. 53			101. 0	17. 6	18. 0	Bascule.
52	Webster Ave	do	4. 90			128. 0	17. 6	17. 6	Do.
53	North Ashland Ave	do	4. 96			140. 0	18. 6	19. 5	Do.
54	Chicago & North Western Ry.	Railway	5. 06			123. 8		19. 3	Bascule. See Note 2.
55	Fullerton Ave	Highway	5. 36			93. 0	22. 4	23. 4	Fixed girder.
56	North Damen Ave	do	5. 62			118. 0	20. 7	21. 6	Bascule.
57	Diversey Parkway	do	6. 07			95. 0		22. 3	Fixed girder.
58	Western Ave	do	6. 48			95. 0	18. 1		Fixed.
59	Belmot Ave	do	6. 84			75. 0		18. 1	Bascule.
60	Addison St	do	7. 29			73. 7		18. 7	Fixed girder.
61	Irving Park Rd	do	7. 80			62. 0		18. 4	Do.
62	Montrose Ave	do	8. 31			68. 0		17. 9	Do.
63	Wilson Ave	do	8. 57			73. 8		17. 9	Do.
64	Chicago Transit Authority (Ravenswood).	Railway	8. 74			40. 4		19. 2	Do.
65	Lawrence Ave	Highway	8. 90			54. 0		18. 7	Do.
	North Shore Channel		8. 91						
	North Branch Canal								
	South end and river		2. 54						
65a	Overhead wire		2. 80					72. 4	
65b	Do		2. 82					72. 4	
66	North Halsted St	Highway	2. 84			56. 9		15. 4	Bascule.
67	Ogden Ave	do	2. 88			132. 6	30. 1	30. 6	Bascule. See Note 6.
68	Division St	do	2. 98			74. 0		18. 4	Do.
69	Chicago, Milwaukee, St. Paul & Pacific RR. (Cherry Ave.).	Railway	3. 54			113. 9		8. 4	Bobtail swing. See Note 3.
	North end, river, and turning basin.		3. 58						

*Right and left refer to sides when going toward the lake.
†Maximum height for arched or sloping bridges, clear height for full width of level clearances.
‡Also known as Ogden Canal, Michigan Canal, and Michigan Slip.

NOTE 1.—Vertical lift, with clearance, when up, of 120 feet.

NOTE 2.—See 33 U.S.C. 499 of Certain Laws, preceding, and 33 C.F.R. § 117.663(h) of Rules and Regulations, preceding.

NOTE 3.—See 33 U.S.C. 499 of Certain Laws, preceding, and 33 C.F.R. § 117.663(e)(7) of Rules and Regulations, preceding.

NOTE 4.—Bridge leaves removed in 1972. Abutments remain.

NOTE 5.—Resident bridgetender assisted by roving tender. Advance notice is required for opening.

NOTE 6.—Operated by roving bridgetender. Advance notice is required for opening.

NOTE 7.—Bridge kept in the open position except for the passage of a train.

ing turning basins at the junction with South Fork and on the west side of the South Damen Avenue bridge. In 1971, the controlling depths were 21 feet at midchannel to the turning basin at the junction with South Fork, thence 3 to 17 feet in the basin with the best water on the east side, 15 thence 20 feet at midchannel to the South Damen Avenue bridge with 8 to 23 feet in the basin on the west side of the bridge. Obstructions not disclosed by the soundings may exist in these channels.

South Fork is badly fouled with oily waste, and a col-

Bridges Across North Shore Channel

No.	Location and name	Kind	Miles from lake shore	Channel spans—clear width	Clear height: Above probable maximum high water	Clear height: Above low-water datum	Remarks
				Feet	*Feet*	*Feet*	
1	Sheridan Rd. (crossing lock)	Highway	0.08	32	12.5	21.6	Fixed girder.
2	Linden Ave	do	.22	61.1	11.4	20.5	Do.
3	Maple Ave	do	.39	67	12.5	21.6	Do.
4	Isabella St	do	.56	67	11.8	20.9	Do.
5	Chicago Transit Authority (Central)	Railway	.77	45.6	25.9	35	Fixed truss.
6	Central St	Highway	.87	63.7	11.6	20.7	Fixed girder.
7	Lincoln St	do	1.04	60.8	11.1	20.2	Do.
8	Chicago & North Western Ry	Railway	1.39	59.5	17.8	26.9	Do.
9	Green Bay Rd	Highway	1.40	66.6	11.4	20.5	Do.
10	Brown Ave	do	1.79	67	11.1	20.2	Do.
11	Emerson St	do	2.27	67	11.4	20.5	Do.
12	Church St	do	2.55	67	10.5	19.6	Do.
13	Dempster St	do	3.05	67	10.5	19.6	Do.
14	Main St	do	3.55	67	10.9	19.9	Fixed truss.
15	Oakton St	do	4.05	81	10.7	19.6	Do.
16	Chicago & North Western Ry	Railway	4.17	60.3	10.3	19.3	Fixed girder.
17	Chicago Transit Authority (McCormick)	do	4.32	101.6	24.1	33	Fixed truss.
18	Howard St	Highway	4.56	81	10.3	19.4	Do.
19	Touhy Ave	do	5.06	67	10.3	19.1	Fixed girder.
20	Devon Ave	do	6.06	67	10.4	18.8	Do.
21	Lincoln Ave	do	6.45	60	11.0	19.3	Do.
22	Peterson Ave	do	6.55	60.5	10.7	18.9	Do.
23	Bryn Mawr Ave	do	7.06	62.6	11.0	18.8	Fixed truss.
24	Foster Ave	do	7.58	59.9	11.3	18.7	Fixed girder.
	Entrance of North Branch Chi. River		7.61				Closed by dam.
25	Water main	Pipeline	7.83	70	11.8	18.8	Fixed girder.
26	Argyle St	Highway	7.84	59.8	11.6	18.6	Fixed truss.
27	Lawrence Ave	do	8.15	54.0		18.7	Fixed girder.

lapsed grain elevator obstructs the east half of the channel about 0.6 mile above the junction with South Branch. In 1971, the controlling depth was 13 feet to the obstruction. Obstructions not disclosed by the soundings may exist.

Rules of the Road.—The demarcation line between the "Rules of the Road—Great Lakes" and "Rules of the Road—Western Rivers" on the Chicago River is at the east side of the Ashland Avenue Bridge (Mile 5.57 on West Fork of South Branch in the Table of Bridges Across Chicago River and its Branches). [33 CFR § 95.02]

Wrecks.—The wreck of the Steamer Columbia, 133 feet long by 30 feet beam, lies along the west dock of the North Branch Canal about 150 feet south of Blackhawk Street. An old hull 90 feet long lies partly submerged at about the same location. These wrecks are marked by a black can buoy. A navigable channel about 80 feet wide is available immediately east of the wrecks. Mariners should exercise due care in passing the site.

Whistle Signal for Opening Draws (see par. (*e*) of Bridge Regulations. See 33 U.S.C. 499 under Certain Laws, preceding, and 33 CFR § 117.663 of Rules and Regulations, preceding), 3 short (— — —), except that 4 short (— — — —) are sounded for the Chicago & N. W. Ry. bridge at Kinzie Street and for the C., M., St. P. & P. R.R., bridge at North Avenue when going either way, and 5 short (— — — — —) when approaching Lake Street Bridge from the north. A red flag or a red lantern is waved when bridge cannot be opened and is displayed until bridge can be opened. Bridges remain closed during hours as specified in paragraph (*a*) of Bridge Regulations. There are no closed hours for bridges on North Branch Canal.

Elimination of Unnecessary Noise.—The city of Chicago is attempting to minimize noises in that area bounded by the Michigan Avenue Bridge (No. 3) on the east, the Chicago Avenue Bridge (No. 45) on the north, and the Roosevelt Road Bridge (No. 23) on the south. Pilots of vessels should give the customary whistle signal for the first bridge approached within this area and, when in the draw of the bridge, should inform the bridgetender of their destination. The bridgetenders will then telephone ahead for the necessary bridge openings. Pilots are asked not to signal for other bridge openings in this area unless prompt service is not provided.

Roving Bridgetenders Along Chicago River.—The city has instituted a system of roving bridgetenders to operate or to assist the resident tender to operate certain bridges across the Chicago River, the North Branch, and the South Branch. The bridges affected are annotated in the table of Bridges, etc., Across Chicago River and Its Branches, following. At least 30 minutes advance notice is required for the first bridge through which a vessel intends to pass. Thence, telephone advice of vessel movements will be passed from bridge to bridge. Notice may be given to the Bridge Desk of the Chicago Department of Public Works, Phone 744-4200.

North Shore Channel.—The Sanitary District has constructed a channel between Lake Michigan at Wilmette Harbor in the village of Wilmette, Ill., and the North Branch of Chicago River at Lawrence Avenue in the City of Chicago. This channel is about 8 miles long, about 80 feet wide at the water line, and is crossed by 27 fixed bridges, described in the table following—Bridges Across North Shore Channel.

Dredging was completed in August 1958, to restore the channel to the original dredged depth of 9.6 feet from Foster Avenue to Wilmette Harbor. For description of north branch of Chicago River north of Addison Street, see index for page reference.

Lock.—The lock at Sheridan Road in Wilmette, Ill. has a lift of 3 feet, is 30 feet wide, 140 feet long, and has a depth of 9.8 feet over the miter sills. The lock is inoperative and is closed to all navigation.

Bridge Regulations.—See 33 U.S.C. 499 of Certain Laws, preceding, and 33 CFR § 117.641 and § 117.663 of Rules and Regulations, preceding.

Charts 14905, 14927—Chicago Sanitary and Ship Canal.—This canal connects the South Branch of the Chicago River with the Des Plaines River at the Lockport lock, a distance of 30 miles. The canal was constructed by the Sanitary District and became a Federal waterway by act of Congress approved July 3, 1930. The United States maintains a channel having a minimum depth of 9 feet through the Ship Canal. In August 1977, submerged pilings were reported in the southwest corner of the turning basin west of South Damen Avenue.

Channel Dimensions.—The canal from South Damen Avenue to Summit, 7.8 miles, is 162 feet wide at bottom and 224 feet at water line; from Summit to Willow Spring, 5.3 miles, 202 feet wide at bottom and 298 feet at water line; in the rock section from Willow Springs to the controlling works at Lockport, 14.9 miles, 160 feet wide at bottom and 162 feet at water line.

Lockport Controlling Works.—At the controlling works there is a fan-shaped basin with an extreme width of 470 feet. Two (2) red, oscillating, warning lights have been installed on the sluice gates at the Lockport controlling works located on the right bank just north of the Butterfly Dam in Lockport, Ill., to warn navigation whenever sluice gates are open.

These lights are mounted on the operator's house located above and at the midpoint of the sluice gate structure. One of these lights is directed in a northerly arc upstream and the other in a southerly arc downstream in such manner that they can be readily observed by approaching navigation. When the sluice gates are open, the red oscillating lights will turn on to warn navigators to stay clear of the sluice gates by passing on the east (left) side of the channel.

From these works to the Lockport lock, a distance of 2 miles, the channel is of irregular width, nowhere less than 160 feet.

Check soundings taken during November 1950 along the sailing line showed depths of 16.8 feet or more. The stage in the canal is controlled by the controlling works at the mouth of Chicago River, on the Calumet River cut-off

Bridges, etc. Across Chicago Sanitary and Ship Canal

No.	Location and name	Kind	Miles from east end of north pier, Chicago	Draw openings—clear width providing 15 feet depth normal to channel			Clear height above low-water datum	Remarks
				Right*	Left*	Center		
				Feet	*Feet*	*Feet*	*Feet*	
	South Damen Ave. (Canal entrance).		6. 1					
1	South Western Ave	Highway	6. 7			155.3	22. 3	Vertical lift. See note 1.
2	Baltimore & Ohio, Chicago Junction, and Pittsburgh, Cincinnati, Chicago & St. Louis Rys.	Railway	6. 8			120	17. 0	Bascule. See note 1.
3	South California Ave	Highway	7. 2			128	†17. 7	Bascule. See note 1.
4	Illinois Central Gulf RR	Railway	7. 6		85		19. 5	Swing. See note 1.
5	South Kedzie Ave	Highway	7. 7			130	22. 3	Fixed. Open.
6	GTW (Atchison, Topeka & Santa Fe) Ry.	Railway	8. 3	45	80		18. 9	Swing. See note 1.
7	South Pulaski Rd	Highway	8. 8			140	†22. 6	Bascule. See note 1.
8	Belt RR	Railway	9. 6	Shallow	97		17. 8	Swing. See note 1.
9	South Cicero Ave	Highway	9. 9			140	†18	Bascule. See note 1.
9A	South Central Ave	do	11. 0			170	42. 38	Fixed.
10	Atchison, Topeka & Santa Fe Ry.	Railway	12. 4	130	85		18. 9	Swing. See note 1.
11	South Harlem Ave. Bridge	Highway	13. 15			130	25. 5	Bascule. See note 1.
11A	Adlai E. Stevenson Expressway (Twin Bridges). I-55	do	13. 6			160	41. 84	Fixed.
12	New Lawndale Ave. (Twin Bridges).	do	14. 2			160	39. 82	Do.
12A	Submerged pipeline	Gas	14. 7					No. Ill. Gas Co. (24″ main).
13	Baltimore & Ohio Chicago Terminal RR.	Railway	14. 9	(**)	90	113	18. 9	Swing. See note 1.
14	Mannheim Rd. (Justice Highway.	Highway	17. 8			250	39. 6	Fixed.
15	Northern Illinois Toll—Twin Bridges.	do	17. 9			242	39. 6	Do.
16	Willow Springs Rd	do	19. 3			163	39. 6	Fixed. Being removed, 1978.
16A	Willow Springs Rd	do	19. 3			163	39. 6	Fixed. See Note 4.
17	Sag Highway	do	23. 1			160	39. 4	Fixed.
	Calumet-Sag Channel		23. 7					
18	Illinois Central Gulf, Lemont	Railway	26. 6			160	19. 1	Bobtail swing. See note 1.
19	Lemont Rd	Highway	26. 7			160	17. 5	Bobtail swing. See note 1.
19A	Aerial pipeline	Oil	30. 5			225	44. 0	Lakehead Pipe Line Co., Inc. (34″ dia.).
20	Romeo Rd	do	31			160	17	Bobtail swing. See note 2.
20A	Butterfly Dam		34. 1	80	80			
20B	Aerial cable	Electric	34. 4				62. 0	Comm. Ed. Co.

See footnotes at end of table.

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Bridges, etc. Across Chicago Sanitary and Ship Canal—Continued

No.	Location and name	Kind	Miles from east end of north pier Chicago	Draw openings—clear width providing 15 feet depth normal to channel			Clear height above Low-water datum	Remarks
				Right*	Left*	Center		
				Feet	*Feet*	*Feet*	*Feet*	
21A	Lockport—9th St	Highway	34. 5			225	47. 5	Fixed.
22	Lockport—16th St	do	35. 1	(‡)	160		4. 4	Bobtail swing.
23	Lockport Lock—Overhead bridge	Foot	36. 1			110	51. 3	Fixed.
	Des Plaines River	Junction	37. 0					See note 3.

*Going in a southwesterly direction (from the lake). †Height for channel width of 80 feet. ‡Not available.
**Span reinforced. Draw unavailable.
NOTE 1.—This bridge will not be opened for navigation.
NOTE 2.—Bridge operated by roving bridge tender who can be reached by telephone at Ruby Street bridge by calling 815/722-3120.
NOTE 3.—For continuation, see table of bridges across Des Plaines River.
NOTE 4.—Under construction 1978 on same alinement as bobtail swing bridge.

channel, at Wilmette Harbor, and at Lockport, but is affected for short periods after heavy rainfall in the Chicago area. Maximum variations of water surface up to 10 feet may be expected immediately above the Lockport lock, gradually decreasing to 4 feet at the head of the canal.

Butterfly Dam.—Just below the controlling works at Lockport is a butterfly dam, swinging on center pivots located in mid stream, and having a channel width of about 80 feet on each side of it when open. Navigators are cautioned to look out for this structure. The dam is normally open, and is solely a safety device, providing a method of stopping the flow of water in the event of an accident to the levee walls or water-power development works 2 miles below.

Overhead Wires.—A number of overhead wires cross the canal, but they do not obstruct any craft that can pass under the bridges.

Des Plaines River.—The improved section of this river is the lower 18.1 miles extending from the Sanitary and Ship Canal at Lockport lock to the confluence of the Des Plaines and Kankakee Rivers (head of Illinois River) at a point 15.4 miles downstream from Jackson Street Bridge, Joliet. Canalization of this section, begun by the State of Illinois, was taken over by the Federal Government under the Act of July 3, 1930, and it is now maintained and operated by the United States. The Act of August 30, 1935, provides for a channel at least 9 feet deep and 300 feet wide.

Channel and Lock Dimensions.—The present minimum channel dimensions are 250 feet in width and 9 feet in depth. There are two locks, located at Lockport and Brandon Road, each 600 feet long by 110 feet wide in the clear for square-ended vessels. The normal lifts are about 38 feet and 32 feet, respectively. Adjoining the main Lockport lock is a smaller auxiliary lock, built by the Sanitary District; it is 130.7 feet long (usable length for square-ended vessels 118.3 feet) and 22 feet wide. The auxiliary lock is not operated.

At Lockport the flow is governed by the operations at the adjoining powerhouse of the Metropolitan Sanitary District of Greater Chicago.

At Brandon Road the dam has movable tainter and sluice gates which control the flow and make it possible to maintain a pool level, with small fluctuation above the dam, under ordinary conditions. Immediately above Brandon Road lock there is a large fan-shaped basin, which is well suited for turning and rearranging tows. Below Brandon Road dam an 8.7-foot fluctuation in water surface may be expected.

Overhead Wires.—A number of overhead wires cross the waterway, but they do not obstruct any craft that can pass under the bridges.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding, and 33 CFR § 117.605 of Rules and Regulations, preceding.

Illinois River.—From its head at the confluence of the Des Plaines and Kankakee Rivers, the Illinois River is 272.9 miles long and enters the Mississippi River at Grafton, Ill., about 38 miles above the Eads Bridge at St. Louis. It is canalized and well suited to navigation. Improvement of the river from its headwaters to Starved Rock, 41.9 miles, was begun by the State of Illinois in 1920 and was taken over by the Federal Government under the act of July 3, 1930. Improvements below Starved Rock have been made from time to time since 1852 by the Federal and State Governments. The entire river is now being maintained and operated by the United States.

The existing project, authorized in the act of August 30, 1935, provides for a channel at least 9 feet deep and 300 feet wide.

Channel and Lock Dimensions.—The present minimum channel dimensions are 200 feet in width and 9 feet in depth at low water. There are five locks, located at points and distances above the mouth of the river, as follows: Dresden Island, 271.5 miles; Marseilles, 244.6 miles; Starved Rock, 231 miles; Peoria, 157.7 miles; and LaGrange, 80.2 miles. The locks are each 600 feet long by 110 feet wide in the clear for square-ended vessels, with lifts varying from about 24 feet to 10 feet, and minimum depth over miter sills of 12.3 feet at low water.

A fluctuation in the river surface of 22 feet may be expected at Dresden Island, and of 18 feet at Grafton.

The most important city on the Illinois River is Peoria, which is equipped with a modern river-rail terminal.

Overhead Wires.—A number of overhead wires cross the river. They provide a minimum vertical clearance of about 40 feet at high water and 60 feet at low water.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding, and 33 CFR 117.604 of Rules and Regulations, preceding.

Lake Michigan Coast.—The coast area north of Chicago Harbor as far as Wilmette is shoaled out to about 4 miles with regard to deep draft navigation. Passage on the recommended vessel courses shown on the standard charts, will clear all known obstructions.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 CFR § 1250.93 of Rules and Regulations, preceding. Carter H. Harrison crib, 2.1 miles 027° from Chicago Harbor Light at the north side of the harbor entrance, carries a light and a fog bell. A submarine high-voltage cable extends northwesterly to Wilson Avenue crib; and a submarine telephone cable extends southeasterly to Four Mile crib. Vessels should not drop anchor in the vicinity of the cables.

William E. Dever crib is located about 182 feet northeast of the Harrison crib. The two structures are connected by a steel bridge about 27 feet above the water, with a clear space between the cribs of about 89 feet. White electric lights, placed 20 feet apart on top of the bridge span, are shown at night throughout the year.

About 2½ miles north of the Chicago River entrance, or about ½ mile south of Diversey Harbor, a partly submerged steel sheet-pile bulkhead adjoins the sea wall off Fullerton Avenue, just east of the Fresh Air Sanitarium, and extends southerly and about 450 feet offshore to a pier off North Avenue, about 1½ miles northerly from the Chicago River. The top of the submerged part of the bulkhead is 2 feet below the water and is marked with piles projecting about 5 feet above datum at intervals of 18 feet in the north section and 28 feet in the south section. Small crafts should not attempt to cross this bulkhead.

Diversey Harbor is located about 3 miles north of the Chicago River entrance and about ⅝ mile southerly from the Belmont Yacht Harbor entrance and on the prolongation of Diversey Parkway. The entrance has a controlling depth of about 9 feet and is crossed by a concrete arch bridge with a vertical clearance of 14 feet. The Chicago Park District has installed traffic "stop & go" lights, one on the east side and one on the west side of the arch bridge to operate as follows: Red Light—3 minutes, Amber Light—1 minute, Green Light—3 minutes. These lights will operate 24 hours a day during good weather. During foul weather the amber light only will be used. Controlling depth in the harbor is about 8 feet decreasing near shore.

Caution Area.—Shotgun firing is conducted intermittently from the Lincoln Park Gun Club property just north of Diversey Harbor creating a danger zone 1,200 feet along the shore extending into the lake 600 feet. When firing is in progress, two red flags will be displayed from standards near the shore line and a red pennant from the flag pole. A spar buoy painted with alternate bands of orange and white is maintained by the Chicago Park District 600 feet offshore and 900 feet 036° from Diversey Yacht Harbor Range Front Light to mark the outer limit of the fall of pellets. A range officer will keep the area under observation during firing periods and will cause firing to cease when vessels find it necessary to enter the area, but all persons are cautioned to enter the area during these periods only when absolutely necessary.

Belmont Yacht Harbor, opposite the foot of Belmont Avenue and about 3¾ miles north of Chicago River piers, is formed by the Lincoln Park extension bulkheads constructed in the lake beyond the original shore line. The entrance is about 270 feet wide and 17 feet deep, and is marked on its north side by a range of two lights on red skeleton towers maintained by the Chicago Park District. The outer light is 47 feet above water. The inner light is 80 feet above water and is 720 feet 296° from the outer light. The harbor has an area of 53 acres, with depth of about 19 feet with a shoal of 17 feet in the center and shoaler water near the shore, and serves as a refuge for medium-sized craft in stress of weather. A rock pile with 11 feet depth lies 4,000 feet northeast of Belmont Harbor Light. A rock shoal area with 9 feet depth, marked by a buoy, is located 1,600 feet northeasterly from Belmont Harbor Light.

A partially submerged shore protection bulkhead is constructed parallel to and about 16 feet lakeward of the existing sea wall between Belmont Harbor and Montrose Harbor, a distance of about 7,300 feet. In 1968, the top of the submerged part of the bulkhead was about 4½ feet below datum and marked with steel piles projecting about 5½ feet above datum at intervals of 20 feet. Area between the submerged bulkhead and the sea wall contains wood piles and large rock varying in elevation from about 4½ feet below and one-half foot above datum. Small craft should not attempt to cross this bulkhead.

Montrose Harbor is located opposite Montrose Avenue, about 4¾ miles north of Chicago River piers and 2,900 feet southwest of Montrose Breakwater Light. The entrance has a width of 170 feet and depth of 18 feet or more. The harbor covers an area of 35 acres with controlling depths of 17 feet in 1968. The harbor entrance is protected by two jetties. The jetty on the east side of the entrance is marked by a light on a red skeleton tower lo-

Bridges Across Des Plaines River

No.	Location and name	Kind	Miles from east end of north pier, Chicago	Draw openings—clear width normal to channel			Clear height above pool level†	Clear height above high water	Remarks
				Right*	Left*	Center			
				Feet	*Feet*	*Feet*	*Feet*	*Feet*	
	End of Chicago Sanitary and Ship Canal.	----------	37. 0						
1	Lockport—Elgin, Joliet & Eastern Ry.	Railway----	37. 1	------	------	225	24. 6	20. 1	Vertical lift; span raises 26.8 feet above heights shown. See Note 3.
2	Joliet—Ruby St---------	Highway---	38. 5	200	------	-------	16. 6	13. 0	Bascule; clear heights are for 105-foot width. See note 1.
3	Joliet—Jackson St--------	-----do-----	38. 8	------	------	150	16. 6	13. 2	Bascule; clear hights are for 80-foot width.
4	Joliet—Cass St----------	-----do-----	39. 1	------	------	150	16. 6	13 4	Do.
5	Joliet—Jefferson St-------	-----do-----	39. 3	------	------	150	16. 6	13. 7	Do.
6	Joliet—Chicago, Rock Island & Pacific Ry.	Railway----	39. 6	------	------	150	9. 5	6. 8	Vertical lift; span raises 41.5 feet above heights shown. See note 2,
7	Joliet—McDonough St----	Highway---	39. 9	------	------	150	16. 5	14. 0	Bascule; clear heights are for 80-foot width.
7A	I-80 (Twin Bridges)------	-----do-----	40. 2	------	------	300	46. 9	43. 3	Fixed.
	Brandon Road Lock and junction with Illinois and Michigan Canal.	----------	41. 2						
8	Rockdale—Brandon Rd---	Highway---	41. 4	------	------	110	-------	8. 2	Bascule.
9	Rockdale----------	Overhead conveyor.	42. 3	------	------	480. 0	-------	48. 0	Suspension.
10	New Smith—Highway—Twin Bridges.	-----do-----	49. 3	------	------	420. 6	47. 2	41. 8	Fixed.
	Kankakee River—beginning of Illinois River.	----------	54. 3						
	Dresden Island Lock------ (For continuation, see table of Bridges Across Illinois River).	----------	55. 7						

*Going downstream. †Pool level with a flow of 8,000 cubic feet of water per second.

NOTE 1.—Bridge clearance gages have been installed on the Illinois Waterway through the City of Joliet as follows:

On right bank, above Ruby Street, near upstream end of retaining wall for the guidance of all downbound vessels; on left bridge pier downstream from McDonough Street for the guidance of all upbound vessels.

The gages are set to show the actual clearance between the water surface and the low steel of the bridges for the center 80 foot width of span. A sign over the gages reads as follows:

"Closed Vertical Clearance for Center 80 Feet of Span Joliet City Bridges."

The masters of all vessels which can safely pass under the bridges in closed position are requested to do so and refrain from opening the bridges whenever possible.

NOTE 2.—Several collisions have occurred in the past at the C.R.I. & P. Railroad Bridge across the Illinois Waterway at Joliet, Ill. Although the damage has been minor, all vessel masters are urged to reduce speed and use due caution in passing this location, as a serious accident would delay both water and rail traffic.

NOTE 3.—Bridge kept in the open position except for the passage of a train.

Bridges, etc., Across Illinois River

No.	Location and name	Kind	Miles from east end of north pier, Chicago	Draw openings—clear width normal to channel			Clear height above pool level†	Clear height above high water	Remarks
				Right*	Left*	Center			
				Feet	*Feet*	*Feet*	*Feet*	*Feet*	
	Des Plaines and Kankakee Rivers	Junction	54.3						
	Dresden Lock		55.7						
1	Divine—Elgin, Joliet & Eastern Ry	Railway	56.6			113.6	26.3	8.2	Vertical lift; span raises 30.3 feet above heights shown.
2	Morris	Highway	63.7			350	50.4	34.9	Fixed.
3	Seneca—Chicago, Rock Island & Pacific Ry.	Railway	73.1			141	19.9	7.8	Vertical lift; span raises 27.6 feet above heights shown.
4	Seneca	Highway	74.5			354	47.8	37.0	Fixed.
	Marseilles Canal (upper end)		80.2						
5	Marseilles	Highway	80.3			225	46.9	46.5	Over canal. Fixed.
	Marseilles Lock (lower end)		82.6						
6	Ottawa—Hilliard Bridge	Highway	87.5			484	47.0	37.8	Fixed; clear heights are for 300-foot width.
7	Ottawa—Burlington Northern RR	Railway	87.8			167	21.2	12.2	Vertical lift; span raises 26.4 feet above heights shown.
	Starved Rock Lock		96.2						
9	Utica	Highway	97.6			356	63.3	44.3	Fixed.
10	La Salle—Illinois Central RR	Railway	101.7			260	61.7	43.3	Do.
11	La Salle—Chicago, Burlington Northern RR.	do	101.8			225	18.8	0.5	Vertical lift; span raises 49.0 feet above heights shown.
12	La Salle	Highway	102.5			249.3	26.9	8.7	Vertical lift; span raises 55.2 feet above heights, shown. See note.
13	Peru	do	104.4			400	62.0	44.1	Fixed.
14	Spring Valley	do	108.8			350	60.5	43.3	Do.
15	Depue—ConRail	Railway	113.3	145.7	162		16.9	2.6	Swing.
	Illinois and Mississippi Canal		117						
15A	Hennepin I-180 bridge	Highway	119.4			350	59.2	42.2	Fixed.
16	Hennepin	Highway	119.6			350	59.2	42.2	Fixed.
	Henry Lock		131.2						Abandoned.
17	Henry	Highway	131.2			359	59.2	42.0	Fixed.
18	Lacon	do	138.1			350	59.0	41.9	Do.
19	Chillicothe—Atchison, Topeka & Santa Fe Ry.	Railway	145.3			360	58.6	41.7	Do.
20	Peoria—McCluggage	Highway	161.4	359	359	411	65.8	48.8	Do.
21	Peoria—Murray Baker	do	164.5			500	65.6	48.7	Do.
22	Peoria—Franklin Street	do	164.9			121	‡28.3	11.5	Bascule.
23	Peoria—Toledo, Peoria & Western RR	Railway	165		118		13.7	−3.1	Swing; right draw not available.
24	Peoria—Illinois Terminal RR	do	165			125			Superstructure removed. Channel piers remain.
25	Peoria—Cedar Street	Highway	165.6			280	78.5	62.0	Fixed arch, clear heights are for 210-foot width.
26	Peoria—Peoria & Pekin Union Ry	Railway	166.5			140	21.3	4.9	Bascule.
	Peoria Lock		169.5						
28	Pekin—Margaret Street	Highway	174.3			210	29.4	7.6	Vertical lift; span raises 55.8 feet above heights shown. See note.
29	Pekin—Chicago & North Western Ry.	Railway	176			153	30.9	9.3	Vertical lift; span raises 41.7 feet above heights shown.
	Copperas Creek Lock		190.4						Abandoned.
30	Havana	Highway	207.6			350	68.4	48.0	Fixed.
31	Beardstown—Chicago, Burlington & Quincy RR.	Railway	238.4	110.5	120		19.7	−0.5	Swing.
32	Beardstown	Highway	239.3			526	69.7	49.6	Fixed.
	New La Grange Lock		247						
	Old La Grange Lock		249.6						Abandoned.
33	Meredosia	Highway	255.9			554.7	72.0	47.3	Fixed.
34	Valley City—Wabash Ry	Railway	265.8			300.6	31.8	6.8	Vertical lift; span raises 46.1 feet above heights shown.
35	Florence	Highway	271.2			202	26.6	4.1	Vertical lift; span raises 56.8 feet above heights shown See note.
36	Pearl—Alton RR	Railway	284	123.7	120.6		20.2	0.5	Swing.
	Kampsville Lock		295.7						Abandoned.
37	Hardin	Highway	305.6			300	25.9	8.8	Vertical lift; span raises 56.9 feet above heights shown. See note.
	Mississippi River	Junction	27.23						

*Going downstream. †Pool level with a flow of 8,000 cubic feet of water per second. ‡For 80-foot width.

Note.—Bridges Nos. 1, 3, 11, 22, 26, 27, 28, 31, 35, and 37 are provided with signals as follows:
Alternately flashing upper and lower vertically arranged green lights—draw to be opened immediately.
Alternately flashing right and left horizontally arranged red lights—draw cannot be opened immediately or, if open, must be closed immediately.

cated 2,830 feet 238° from Montrose Breakwater Light. The jetty on the west side of the entrance is marked by a light on a white skeleton tower located 2,975 feet 240° from the breakwater light and 200 feet westerly from the east jetty light.

Montrose Breakwater Light is located on a red skeleton tower at the easterly limit of Lincoln Park extension, off Montrose Avenue, about 2⅛ miles 264° from Wilson Avenue crib and 1.3 miles north of Belmont Yacht Harbor. Wilson Avenue Breakwater Light is located on a white skeleton tower on the north end of the breakwater, off Wilson Avenue, 1,930 feet 003° from Montrose Breakwater Light. Foster Avenue Pierhead Light is located on a white skeleton tower on the lakeward end of a shore protection jetty which extends 200 feet northeasterly into Lake Michigan from the shore protection along Foster Avenue, 1 mile from Wilson Avenue Breakwater Light.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 CFR § 1250.93 of Rules and Regulations, preceding. Wilson Avenue intake crib is on the prolongation of Wilson Avenue, 2¾ miles northeasterly from the entrance of Belmont Yacht Harbor and 5⅝ miles north of Chicago Harbor entrance. The crib is a steel structure 70 feet in diameter, surmounted by a granite and brick superstructure rising 47 feet above water; it is marked by a light, and an automatic fog bell maintained by the City of Chicago.

Submarine Cable.—A submarine high-voltage cable extends southeasterly from Wilson Avenue crib to Carter H. Harrison crib; vessels should not drop or drag anchor in the vicinity of the cable.

Automatic Wave Recorder.—An automatic wave recorder consisting of an underwater tripod supporting a pressure-sensing element has been installed in 31 feet of water by the State of Illinois, Division of Waterways, about 400 feet northwest of Wilson Avenue crib. This installation was confirmed in 1968 and there is about 6½ feet least depth over the installation which is not marked.

At a distance of from 4 to 6 miles southerly of Wilmette Harbor, a shoal area of sand and gravel, with outcropping rock, on which there are outlying depths of 15 to 18 feet, extends 3½ miles easterly from the lake shore south of Evanston. The outer or easterly limit of this area is at a point about 3½ miles north from Wilson Avenue crib. Large vessels should keep at least 4 miles from shore at this locality.

Automatic Wave Recorder.—An automatic wave recorder has been installed by the State of Illinois, Division of Waterways, about 200 feet 110° from the southwest corner of the Evanston Waterworks' bulkhead. The instrument, which is a step resistance gauge, is mounted on a steel tripod extending 13 feet above the water. A submarine cable connects the tripod to the recorder in the Waterworks office.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 CFR § 1250.93 of Rules and Regulations, preceding. An Evanston, Ill., water intake on a 42-inch pipeline, with least depth of about 16 feet over the top of the intake, is located about 5,600 feet east from the shore about 1⅛ miles southerly from Wilmette Harbor. A second Evanston water intake, on a 30-inch pipeline, with least depth of about 12 feet over the top of the intake, is located about 2,600 feet east of the pumping station bulkhead. A buoy marks the easterly side of the intake crib. A third Evanston water intake, on a 48-inch pipeline, with least depth of about 12 feet over its top is located about 1,800 feet east of the pumping station bulkhead.

Wilmette Harbor, Ill.—This small-craft harbor is about 14 miles north-northwest of Chicago Harbor at the north terminus of North Shore Channel. It is used primarily by pleasure craft and has an area of about 8 acres.

Channels.—The harbor is entered northwesterly from deep water in Lake Michigan between two piers to an inner harbor basin. A breakwater extending easterly from the shore north of the entrance piers provides some protection from northerly winds. In July 1978, the controlling depth in the entrance channel was reportedly being maintained to 8 feet during the boating season. In 1971, the controlling depth in the basin was about 3 feet.

Caution.—When approaching the harbor during periods of reduced visibility, mariners are cautioned against mistaking the breakwater for the north pier.

Aids to Navigation.—Grossepoint Light, a private aid 119 feet above the water on a white conical tower, is about 0.9 mile south of Wilmette Harbor entrance. The outer ends of the Wilmette Harbor piers and breakwater are marked by private lights.

The white dome of the Baha'i Temple, about 1,400 feet southwest of the south pier light, is prominent from lakeward of Wilmette.

Harbor Facilities.—Limited transient mooring, gasoline, a hoist capable of hauling out 30-foot craft, limited supplies, a pump-out station, and minor repairs are available in the harbor.

Coast Guard Station.—Wilmette Coast Guard Station is on the north side of the harbor basin.

Sluice Gate.—To regulate the flow of water from Lake Michigan into the North Shore Channel, a sluice gate has been constructed at the southwest end of the harbor basin by the Metropolitan Sanitary District of Greater Chicago. This structure blocks access from the harbor to the channel. Since there may be considerable current through the harbor when the gate is open, a red, oscillating, warning light is operated near the gate.

Section VIII.—West Shore of Lake Michigan From Wilmette, Ill., to Wind Point, Wis.

Chart 14905.—The stretch of about 21 miles from Wilmette to Waukegan, Ill., is generally in a northwest direction. North of Wilmette, the coast is level with bluffs rising to about 70 feet at Glencoe and continuing thus to Waukegan. In the immediate vicinity of Wilmette, an offshore bank and detached shoals extend out over 2 miles; the outer limit of this foul area being a 21-foot spot lying 2¼ miles east of Wilmette Breakwater Light. Mariners are cautioned to keep well to eastward

of this location. The shore is bordered by shoals to an average distance of 1½ miles, with some outlying spots A rock shoal about 1,000 feet in diameter, with least depth of 21 feet, is located about 8 miles northerly from Wilmette Breakwater Light and 3⅜ miles from shore.

Wreck.—In November 1966, a mobile crane was washed from a barge into 40 feet of water at a point about 10,900 feet 058° from the Coast Guard Station tower at Wilmette, Ill. In September 1968, investigation indicated 15 feet over the wreckage. Wilmette Wreck Lighted Buoy WR2 marks the wreck area.

Dumping Grounds Regulations.—See 33 U.S.C. 407, 419 and 421, published in Certain Laws, preceding, and 33 CFR § 205 of Rules and Regulations, preceding.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 CFR § 1250.93 of Rules and Regulations, preceding. The village of Wilmette water intakes, with least depths of 19.5 feet are located about ⅝ mile north of Wilmette Harbor. The intake structures consist of two steel drums 14 feet in diameter, about 45 feet apart. About 1,500 feet inshore from these structures is an emergency intake with its top 14 feet below water surface.

A potable water intake off **Kenilworth**, about 1¾ miles northwest of Wilmette Harbor, has a depth of 14 feet over the intake crib.

At **Hubbard Woods**, 3½ miles northwest of Wilmette Harbor, are three intake cribs of the village of Winnetka. The southerly one has 15 feet over the crib, the most northerly is a potable water intake and has 20 feet over the crib and the most westerly has 10 feet over the crib. Each of the intake cribs is marked with a buoy.

Off Glencoe there is a ridge of ledge rock, known as **Glencoe Shoal**, about 1,000 feet long and 200 feet wide, with a depth of 8 feet on its northeast end, located 5½ miles northwesterly from Wilmette Breakwater Light and 1 mile offshore.

Grossepoint Outer Lighted Bell buoy marks a rock bank, with 22 feet least depth, located in deep water 6¼ miles northeasterly from Wilmette Breakwater Light.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. At Glencoe, a potable water intake crib has a depth of 16 feet of water over it.

A potable water intake crib, with 19 feet of water over it, for the village of Northbrook is located just northwest of Glencoe water intake.

At **Highland Park** are three intake pipelines extending northeastward close together and terminating at separate intake cribs. The outermost crib extends 3,500 feet offshore and has 29 feet of water over it.

The **Highwood** water intake, with least depth of about 17 feet over it, is located 2,500 feet offshore and about 7 miles southeasterly from the U.S. Naval Training Center East Breakwater Light. A second intake extends about 2,000 feet from the same location on the shore at Highwood.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. Just east of the tower at **Fort Sheridan**, an intake pipeline extends about 3,600 feet northeastward to about 17 feet of water.

Wreck.—In 1958, a crawler crane was lost overboard in 40 feet of water, approximately 4 miles 090° from the tower at Fort Sheridan, Illinois.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The **Lake Forest** water intake, with least depth of 21.9 feet over it, is located about 2½ miles southeasterly from the U.S. Naval Training Center East Breakwater Light and 2,975 feet offshore.

Great Lakes, Ill.—U.S. Naval Training Center Harbor.—This harbor, located 3¾ miles southerly from Waukegan Harbor Light, is a protected area of about 100 acres enclosed by breakwaters on the north, east, and south. The north breakwater extends east from the shore and joins the east breakwaters, which then leads south to the entrance channel. The south breakwater extends eastward from the shore to the entrance channel. In 1971, the depth of water in the center of the entrance was 15 feet. There is a hazardous sand bar at a depth of 12 feet which partially closes the south half of the entrance. Immediately inside of the entrance, a channel leading to the inner harbor has a depth of 14 feet. Beyond this area the depth gradually decreases to the shore line.

The Commander's authority to enter the harbor is required in each case, except that the harbor is available as a refuge during storm or other emergency.

Aids to Navigation.—The harbor entrance is defined by two lights. East Breakwater Light is on a white skeleton tower 47 feet above the water, about 60 feet from the south end of the east breakwater.

South Breakwater Light is on a white skeleton tower 45 feet above the water, about 60 feet from the east end of the south breakwater. East Pierhead Light is on a white tower 15 feet above the water, 1,600 feet 286° from the East Breakwater Light. West Pierhead Light is on a white tower 15 feet above the water, 2,000 feet 284.5° from the East Breakwater Light.

Two range lights, with white triangular daymarks, mark the center line of the approach to the inner harbor; the front light being located on the inner end of the north pier, and the rear light on the side of bluff about 200 feet 302°45′ from the front light.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The United States Naval Training Center at Great Lakes, Ill., has a water intake consisting of three submerged cribs in 33½ feet of water with 29 feet depth over them located about 7,550 feet offshore and 1¼ miles northeasterly from the East Breakwater Light.

A Danger Zone (Area E-2) for rifle firing practice extends 3 miles into Lake Michigan in the area of the U.S. Naval Training Center. The danger zone is bounded on the north by latitude 42°20′30″; on the east by longitude 87°47′30″; on the south by latitude 42°18′45″ and on the west by the shoreline. The Danger Zone is encompassed by a series of 11 white and orange plastic buoys. The north and south latitude buoys are at 1,000-yard intervals and

the east longitude buoys are at 900-yard intervals. When firing is in progress, red flags are displayed on shore near the rifle butts, readily discernible to vessels in the vicinity, and the area should not then be entered. Firing is normally conducted daily from about April 1 to November 1. Warnings are published in the Notices to Mariners and in the public press at the beginning of each firing season. The area may, however, be closed without advance notice other than display of the flags. The Commander has authority to stop vessels at the boundaries of the zone and to prohibit their crossing the area until convenient to the firing schedule.

Danger Zone Regulations.—See 33 U.S.C. 1, published in Certain Laws, preceding, and 33 CFR § 204.175 of Rules and Regulations, preceding.

Restricted Area (E-2).—See 33 CFR § 207.475 of Rules and Regulations, preceding. A restricted area for naval operations is located in Lake Michigan easterly of the U.S. Naval Training Center at Great Lakes, Ill.

Navigation Regulations.—See 33 U.S.C. 1, published in Certain Laws, preceding, and 33 CFR § 207.475 of Rules and Regulations, preceding.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 CFR § 1250.93 of Rules and Regulations, preceding. North Chicago has three water intakes; one about 1⅜ miles northeast from the East Breakwater Light at the United States Naval Training Center, extends about 6,500 feet lakeward from North Chicago Water Treatment Plant and has 24 feet of water over the intake; the second, North Chicago Waterworks Intake, rising about 6 feet above the lake bottom in about 16 feet of water, is located about 2,200 feet due east from shore and about 1⅛ miles north from the East Breakwater Light at the United States Naval Training Center; the third, North Chicago Waterworks Inner Intake, rising 6 feet above the lake bottom in about 14 feet of water, is located 1,150 feet offshore and 50 feet north of the preceding intake line.

Three submerged intake cribs of the American Steel & Wire Division, United States Steel Corp., with least depth over cribs of 16 feet and over intake pipes of 24.5 feet, are about 6,800 feet offshore and about 2⅛ miles northeast of the East Breakwater Light at the United States Naval Training Center.

The Waukegan water-intake crib, with top submerged to depth of 19.7 feet, is located 1,275 feet southeasterly from Waukegan Harbor Light.

A second water intake pipeline of the city of Waukegan, a 48-inch intake pipeline, commences just south of the south pier, and south of the Waukegan Waterworks, and extends about 6,250 feet southeasterly. The depth over the intake crib is 29.3 feet.

Navy Training Target.—An Anti-Submarine Warfare training target has been permanently moored in 120 feet of water at a depth of 55 feet below the surface in position 42°17′ N., 87°39′ W. Target is cylindrical in shape, 34 feet long and 8 feet in diameter, painted light grey and vivid orange.

Charts 14904, 14905—Waukegan Harbor, Ill.—This harbor is located about 38 miles northerly from Chicago Harbor and 51 miles southerly from Milwaukee Harbor. The control of Waukegan Harbor is vested in the Waukegan Port District, a municipal corporation of the State of Illinois. The Port District office is at the airport, about 4 miles northwest of the harbor, at 3500 N. McAree Road, Waukegan, Ill. 60085.

Channels.—The harbor is entered through a dredged entrance channel leading from deep water in Lake Michigan between parallel piers to an inner harbor basin. A breakwater extending from shore on the north side of the entrance channel protects the entrance from northeasterly seas. In June 1978, the controlling depths were 21 feet in the entrance channel except for minor scattered shoaling, thence 19 feet in the channel between the piers and the eastern part of the inner basin with 16 feet in the western part of the basin. The entrance channel is subject to shoaling caused by the drift of sand from the north.

The inner basin is not adapted for anchorage, but vessels may moor to the revetment on the west side or in the slips northward of the basin. During severe storms, vessels are sometimes required to moor in the middle of the slips and away from the docks to prevent damage to the vessels and revetments. Mariners are cautioned against navigating outside the channel limits in the vicinity of structures protected by stone riprap.

Dangers.—A foul area with a number of detached rock ledges is eastward of the harbor entrance. The area is marked by a buoy on the east side and a lighted buoy on the north side. Mariners should keep to the northward of the lighted buoy.

Aids to Navigation.—Waukegan Harbor Light, on the outer end of the south pier, is 36 feet above the water on a white cylindrical tower on top of a building; a fog signal is at the light. Waukegan Breakwater Light is on the southeasterly end of the breakwater. North Pierhead Light is 1,100 feet 251.5° from Waukegan Breakwater Light.

Harbor Facilities.—Small boat slips and some facilities are located in the southwesterly part of the basin. A private channel connects to the north end of the inner basin, extending about 1,500 feet northerly. Soundings taken in July 1968 showed a controlling depth of 14 feet in the westerly half for the southerly 1,400 feet shoaling to 8 feet at the north end. Off the dock which extends along the east side of the channel, controlling depth along the southerly 1,200 feet was 16 feet shoaling to 10 feet at its north end. Two slips branch off this channel in a northwesterly direction. The southerly slip, which joins the channel just north of the inner basin, is 160 feet wide and about 600 feet long. Commercial dockage is maintained along both sides of the slip. In March 1977, depths of 18 to 20 feet were reported at the outer end of the slip, shoaling to 16 feet near the inner end.

The other slip, which joins the channel at its northerly end, is 100 feet wide at the entrance narrowing to 30 feet at the inner end, and about 450 feet long and is revetted on both sides. Soundings in July 1968 showed depths of 3 to 7 feet.

A marina on the southwestern side of the harbor has berthing with 12 feet reported alongside. Gasoline and

diesel fuel, both available at dockside pumps, water, ice, electricity marine supplies, a 10-ton hoist, launching ramps, covered winter storage, sewage, sewage pump-out station, and hull and motor repairs are available at the marian. Similar services and a 25-ton hoist were reported available at the marina in the northerly slip at the north side of the harbor.

Navigation Regulations.—See 33 CFR § 162.120, 162.130, and § 207.473 of Rules and Regulations, preceding.

Local Harbor Regulations.—Local harbor regulations have been established by the Waukegan Port District and are enforced by the **dockmaster,** who can be reached at the municipal launching ramps in the southwest section of the harbor. Copies of the regulations can be obtained from the General Manager, Waukegan Port District, 3500 N. McAree Road, Waukegan, Ill. 60085. A **speed limit** of 5 m.p.h. is enforced in the inner and outer harbor of Waukegan.

Chart 14904.—From Waukegan to Kenosha, a distance of 16½ miles, the offshore bank is from ⅜ to ⅝ mile in extent, with no detached outlying shoals. Small craft running close to shore in the vicinity of Barnes Creek should beware of the charted rock awash about 600 feet offshore.

About 1½ miles north of Waukegan is a breakwater extending about 1,200 feet from shore and protecting the intake of the Waukegan Generating Station, Public Service Company. A fish net is placed annually, between April and August, from the east end of the north breakwater to the shore about 1,200 feet southwestward. The net shows above the water and is marked by private buoys and floats. Three tall stacks of the company are prominent and marked with vertically aligned lights.

Water Intake.—The intake crib of the Johns-Manville Products Corp. is located about 1,200 feet offshore and about 2⅛ miles north of Waukegan. There is a privately maintained light on the crib.

Commonwealth Edison Co. nuclear power plant at Zion, Ill., has intake and discharge lines and structures extending about 2,600 feet into the lake. Buoys mark the outfall discharge. The intake has a fish net installed over it and a buoy marks the area. The towers of the plant are reported to be prominent from offshore.

Potable Water Intake.—The Lake County water intake crib, having 20 feet of water over it, is located 2,645 feet offshore at a point 7 miles north of the Waukegan Harbor entrance.

The Wisconsin-Illinois State line is about 9 miles north of Waukegan, or 7 miles south of Kenosha.

Runaway Bay, a small-craft harbor, is 12 feet north of the Illinois-Wisconsin State line and, in July 1978, it was reported that a 100-foot wide entrance channel into the harbor had a depth of 4 feet. In July 1978, a depth of 3 to 12 feet was reported in the harbor. A private light is on the north side of the entrance to Runaway Bay. Runaway Bay has dockside gasoline pumps on the north side of the entrance channel. Berthage, water, ice, electricity, open and covered storage, limited marine supplies, pump-out station, launching ramp, and a 40-ton hoist with a width restriction of 18 feet are available in the harbor. Hull, engine, and radio repairs are also available.

Water Intake.—The American Brass Co., water intake, marked with a buoy, is located in about 16 feet of water about 1,800 feet offshore at a point about 1 mile south of the Kenosha Harbor entrance.

Kenosha Harbor, Wis.—This harbor is located at the mouth of Pike Creek, distant about 54 miles northerly from Chicago and 35 miles southerly from Milwaukee.

Channels.—The harbor is entered through a dredged entrance channel leading from deep water in Lake Michigan between parellel piers to an inner harbor basin. A detached breakwater on the north side of the entrance channel protects the entrance from northeasterly seas. In June 1978, the controlling depths were 23 feet in the entrance channel, thence 26 feet between the piers and revetments to the inner basin, thence 20 feet in the basin with 10 feet along the north basin limit at the 50th Street bridge.

The entrance channel is subject to shoaling caused by the drift of sand from the north. Severe easterly gales cause considerable disturbance in the basin.

The inner basin is not adapted for anchorage, but vessels may moor to the revetments surrounding it. Mooring to the breakwater or piers is prohibited.

Caution.—The original mouth of Pike Creek has been bulkheaded and filled. The creek has been diverted and now enters the harbor basin at the foot of 52nd Street through a 13-foot pipe. The creek flows into the harbor with velocities to 2 m.p.h.

Disposal Area.—A diked disposal area is on the south side of the south pier.

Aids to Navigation.—Kenosha Harbor Entrance buoys mark the lakeward end of the 800-foot wide approach channel. Kenosha Breakwater Light on the southeast end of the breakwater and Kenosha Light on the outer end of the north pier form a rough range for approaching the entrance channel. A fog signal is at the latter light. Kenosha South Pier Light is on the outer end of the south pier.

Coast Guard Station. Kenosha Coast Guard Station is located on the east side of the inner basin.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

Local Harbor Regulations.—Harbor regulations have been established by the city of Kenosha. Copies of regulations may be obtained from: City of Kenosha, Transportation Dept., 625 52nd Street, Room 104, Kenosha, Wis. 53140.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The city of Kenosha's waterworks north intake is located in 25 feet of water 2,625 feet 046½° from the breakwater light. The depth over the crib is 23 feet and it is marked with a buoy.

With the exception of Racine Reef, the coast from Kenosha to Racine, 10 miles northerly, is clear outside of a shoal limit, within the 21-foot contour, extending about 1 mile from shore.

Structures at Kenosha

No.	Location and name	Kind	Miles above South Pierhead Light	Draw openings—clear width		Clear height above low-water datum	Remarks
				Right*	Left*		
				Feet	*Feet*	*Feet*	
1	Submerged pipeline	Water	0.38				36″ pipe. Approx. depth 35½ feet.
2	50th St. (over lagoon)	Highway	.70	56	78.0	16.0	Fixed; not lighted.

*Looking downstream toward the lake.

Racine Reef is a large shoal with detached spots surrounding, lying with its westerly end about 3,000 feet southeasterly of Racine Harbor entrance. The main reef is 1¾ miles in extent east and west by ¾ mile north and south, with least depth of 1 foot over a crib near its center. Racine Reef Light, surrounded by protective riprap extending horizontally out from the base of the structure about 60 feet, is located in 20 feet of water on the easterly side of the reef, 2 miles 104° from Racine Pierhead Light and should not be passed extremely close aboard, even by vessels of shallow draft; a diaphragm fog horn sounds continuously. A lighted buoy is moored on the extreme westerly edge of the reef.

Charts 14904, 14925.—Racine Harbor, Wis.—This harbor is located at the mouth of **Root River**, distant about 64 miles northerly from Chicago Harbor and 26 miles southerly from Milwaukee Harbor.

Channels.—A dredged entrance channel leads from Lake Michigan between converging breakwaters through the outer basin to the mouth of Root River and thence upstream for about 0.7 mile to just below Fourth Street. In June 1978, the midchannel controlling depths were 19 feet from deep water in the lake to the mouth of the river, thence 16 feet to just below the Main Street bridge, thence depths decreasing to 8 feet at the head of the project. Above the dredged channel, depths are about 8 feet to Fourth Street, thence decreasing to 3 feet at Marquette Street bridge, thence depths of 1 to 4 feet for about 2.5 miles above Marquette Street bridge. There are rocks on the river bottom just inside the mouth between the north channel limit and the north revetment.

The outer basin is not adapted for anchorage by large vessels but reduces wave action in the lower section of the river. State-designated small-craft anchorages are on the north and south sides of the outer basin. Contact the Racine County Water Patrol for details. Mooring to the breakwaters and the pier on the north side of the river mouth is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

The channel inside the river is narrow and tortuous making navigation for large vessels difficult. Currents in the river attain velocities up to 3 m.p.h.

Aids to Navigation.—Racine North Breakwater Light is located on the southeasterly end of the breakwater; a fog diaphragm horn sounds as required. Racine South Breakwater Light is located on the outer end of the south breakwater. North Pierhead Light marks the stub end of the north pier.

Harbor Facilities.—Utilities and fuels are available from dockside facilities. A boat hoist carryall with a 15-ton 50-foot length capacity is available and the Racine Yacht Club has a boat hoist with 20-ton capacity.

The Racine County Water Patrol is located at the former Coast Guard station near the inner end of the north stub pier.

Bridge Regulations.—See 33 U.S.C. 499 published in Certain Laws, preceding, and 33 CFR § 117.660 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

Local Harbor Regulations are under the control of the harbor commission and are enforced by the harbormaster who can be reached through the Racine County Water Patrol.

A **slow no-wake speed** is enforced within the harbor limits. Copies of the regulations can be obtained from the Commissioner of Public Works, City Hall, 730 Washington Avenue, Racine, Wis. 53403.

* * * * *

Bridge Regulations

Sec. 10.05.030. Traffic Delay. In case street traffic is delayed by reason of the draws of either bridge having been continuously opened for 5 minutes or more for the passage of boats, the draws may be closed, but shall be again opened for the passage of boats as soon as practicable; provided however, that no boat shall be delayed for a longer period than 15 minutes.

Sec. 10.05.040. Signal When Bridge Cannot Be Opened.

Bridges, etc. Across Root River at Racine

No.	Location and name	Kind	Miles above mouth of river	Draw or span openings—clear width in feet proceeding upstream			Clear height above low-water datum	Remarks
				Right	Left	Center		
							Feet	
1	Main St*	Highway	0.29			90	9.6	Bascule.
2	State St*	do	.53			80	20.1	Bascule.
4A	Aerial Cable	Electric	.97				53.0	Wis. Elec. Power.
5	Marquette St	Highway	1.17	58	58	58	9.8	Fixed. Not lighted.
5A	Aerial Cable	Electric						Western Pub. Co., Inc.
6	Aerial pipeline	Pipeline	1.32			137	12.0	Do.
7	6th St	Highway	1.46			49.1	24.8	Fixed. Not lighted.
8	Chicago & North Western Ry. (between 8th and 9th Sts.).	Railway	1.65	107	107		17.6	See Note 3.

*Lighted in accordance with 33 CFR, Part 68, and Note, in Rules and Regulations, preceding.

Signals for Opening Draws: Main Street, 1 long, 1 short blasts (— —); State Street, 3 short blasts (— — —).

Note 3.—Fixed. Not lighted. Neither draw is accessible, the rails and timbers being continuous across the ends of the draws. The depth would only permit passage of very small vessels.

In case the draw cannot be immediately opened when a signal is given, a red flag or ball by day or a red light at night shall be conspicuously displayed.

Sec. 10.06.010. Boats Obstructing Passage. All boats when passing any bridge in the city shall be moved past as expeditiously as is consistent with proper movement in the river, and in no case shall any boat, while passing any bridge and obstructing the same, remain or obstruct the passage across such bridge more than 5 minutes, nor shall any boat be so anchored or fastened as to prevent the free and speedy opening of any bridge or the free passage of other boats through the same.

Sec. 10.06.020. Free Passage Over Bridges. No person shall in any manner obstruct the free passage over and upon the bridges of the city.

Sec. 10.06.030. Opening Draws. No person except the bridgetender or person authorized to act in his stead shall open or in any manner interfere with opening any bridge.

Sec. 10.06.040. On Draw After Ringing of Bell. No person shall be upon or ride or drive, or attempt to ride or drive any vehicle onto or upon the draw of any bridge in the city after the bell thereon commences ringing.

Sec. 10.06.050. Loitering On Bridges. No person shall stand, sit or loiter on any bridge, or the abutments or railings, if the bridge is in passable condition.

Sec. 10.06.060. Diving Or Jumping From Bridge. No person shall dive or jump from any bridge within the city into the water beneath.

Sec. 10.07.010. Boats Damaging Bridges. The person having charge of any boat desiring to move past any bridge shall allow a reasonable time for the opening of such bridge, and no person shall move any boat against any bridge or draw thereof before the bridge is opened.

Sec. 10.07.020. Damaging Bridges. No person shall willfully injure or damage any bridge or abutment, or part thereof. No person shall fasten or hitch any boat, timber or other floating material to any bridge or abutment.

Sec. 10.07.030. Damaging Shore Protection. No person shall damage or remove any portion of the improved shore protection of any navigable waters within the city.

Sec. 10.07.040. Cost of Repairs. Any person who violates any provision of this section shall, upon conviction thereof, be liable for the cost of repairing any damage resulting from such violation, in addition to the penalty provided for violation of this code.

* * * * *

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A Racine Water Dept. waterworks intake pipeline extends from the shore line inside the north breakwater, 6,460 feet 057° under the north breakwater to an intake crib in about 33 feet of water. There is a depth of 25 feet of water over the crib and it is not marked. A second pipeline spur extends from the foot of Hubbard St., extended into the same pipe. A waterworks intake pipeline extends 860 feet 083° from the shore line at the foot of Hubbard St. extended, to the north breakwater, thence 350 feet 042°, thence 5,290

feet 056° to an intake crib in about 34 feet of water. There is 28 feet of water over the crib and it is not marked.

A Racine Water Dept. waterworks intake pipeline commences at the inner angle in the north breakwater and extends about 4,050 feet 055° to a crib in 28 feet of water. There is about 23 feet of water over the crib. It is not marked.

From Racine, the shore line bears in a long curve about 3½ miles northeasterly to Wind Point. Wind Point Light is near the end of the point.

Wind Point South Shoal lies 6,900 feet (1¼ miles) southeasterly from Wind Point Light and has a least depth of 17 feet; it is marked by a buoy in 24 feet on its easterly edge.

Section IX.—West Shore of Lake Michigan From Wind Point. Wis., to Rawley Point.

Chart 14904.—Northwesterly from Wind Point, the coast is bluff and clear to within ⅜ mile except for Wind Point North Shoal. This is a rocky reef covered with boulders and having a least depth of 17 feet, situated 8,850 feet northeasterly from Wind Point Light; a buoy marks the southeasterly end of the reef. All vessels, especially in heavy weather, should keep well outside of the buoy, for while there is deep water inside of it there are also other reefs that would be dangerous.

Caution Area (Area E-4.).—A firing area for small caliber weapons is at the Racine County Line Rifle Club Range about 6 miles north of the city of Racine, Wis. The firing creates a caution zone approximately 3,500 feet wide extending about 3 miles into the lake. Mariners should navigate the area with caution and consult the Notices to Mariners for latest information.

Oak Creek Power Plant.—The Wisconsin Electric Power Co. has constructed a private coal dock of steel sheet piling 900 feet wide having a deck height of about 10 feet and extending about 900 feet beyond the shore line on the shore of Lake Michigan in the southerly part of the city of Oak Creek, 5¾ miles northwesterly from Wind Point Light. A combined water intake and open slip approximately 200 feet wide is located along the south side of the dock and a steel sheet pile cell 30 feet in diameter for a turning pier is located 350 feet lakeward of the southeast corner of the dock. The line of approach is marked by Oak Creek Range on an azimuth of 269° with the front light mounted on a gray pole 20 feet above water on the winding pier and the rear light on the wharf, 350 feet from the front light, mounted on a gray pole 22 feet above water.

The four stacks of the powerplant are very prominent and make a good landmark. The southernmost is lighted.

In 1971, the controlling depth was 21 feet in the approach with 17 feet in the northerly half of the slip and 10 feet in the southerly half. In September 1978, it was reported that the slip was being maintained to a depth of about 25 feet.

Strong currents may exist due to a large volume of plant intake water at the west end of the channel.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake is located 2½ miles north of Oak Creek Harbor. It extends easterly 3,500 feet to a crib with 19 feet over. It is not marked.

Outfall Pipeline.—A submerged outfall pipeline adjacent to the south limits of the City of South Milwaukee, Wisconsin, extends approximately 1,990 feet into Lake Michigan from a steel sheet piling revetment wall, and with a least depth of 21 feet over the outfall structure.

About 3 miles north of the Oak Creek Power Plant, a large fill with steel sheet piling revetment has been constructed by the City of Milwaukee, as a basic part of the sewage disposal plant. The revetment forms a trapezoid and extends 1,000 feet from shore, is 2,100 feet long at its base along shore and 1,200 feet along its outer face.

South Milwaukee Harbor, Wis., is at the mouth of Oak Creek, about 9 miles to the southward of Milwaukee Harbor. The clay bluffs forming the lake shore to the north and south have an elevation of 60 feet or more above the lake. The original depth of water at Oak Creek varied from about 3 feet to 0. The north pier, extending 785 feet 110°, is in a dilapidated condition and projects about 200 feet beyond the shore line. The south pier, 300 feet long and 200 feet from the north pier, was burned in 1920; the ruins project about 90 feet beyond the shore line. The improvement is now useless for navigation. In 1966, private interests rebuilt the south pier with stone-filled cribs and extended it to include an additional 600-foot section, extending southwesterly from the outer end of the south pier to form a basin.

Abreast of South Milwaukee, an area of foul water with rock bottom, detached by deeper water inside it, lies with its outer edge about 2 miles and its inner edge about 1¼ miles from the shore; the least depth of about 18 feet is located 2.1 miles northeasterly from South Milwaukee north pier and 1.9 miles from shore. A shoal with but 10 feet at ⅝ mile out extends 1⅛ miles from the shore about 3 miles north of the piers at South Milwaukee.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake is located 5½ miles south of Milwaukee Harbor Entrance, extends 2,500 feet easterly to a crib with 20 feet over. It is not marked.

Wreck.—The sunken Dredge No. 906 with a least depth of 27 feet in 1962, is located 3⅝ miles 096° from the north stack of the Wisconsin Electric Power Company plant on South Point. It is marked with a buoy located 6¼ miles 129° from Milwaukee North Breakwater Light.

To the vicinity of the Milwaukee piers, the offshore bank has a maximum width of ⅜ mile down to South Point of Milwaukee Bay, where shoals having from 11 to 14 feet of water on them lie within a distance of 1 mile from the shore. A buoy is moored off the easterly extremity of these shoals, 3.7 miles southeast of Milwaukee Breakwater Light. To avoid the offshore bank and outlying spots from South Milwaukee northward to South Point, vessels should keep to lakeward of the buoy.

Potable Water Intake.—See 42 U.S.C. 264, published in

Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The Milwaukee, Texas Avenue Water Intake line is 2½ miles south of the Main Harbor Entrance and extends 1½ miles offshore on a bearing of 054.4°. More than 39 feet of water exists over the top of the submerged intake structure and it is not marked.

Wreck.—The freighter Prins Willem V, sunk in 1955, is located about 3¾ miles east of Milwaukee Harbor entrance The wreck was swept to a clear depth of 40 feet in July 1955.

Charts 14904, 14924.—Milwaukee Harbor, Wis.—This harbor is located at the mouth of the Milwaukee River, about 85 miles north of Chicago Harbor and 95 miles from the south end of the lake. It comprises an outer harbor protected by breakwaters, a river entrance channel protected by parallel piers, and an interior commercial harbor, located in the Milwaukee, Menomonee, and Kinnickinnic Rivers.

Railroad car ferries, petroleum tankers and Lake Michigan freighters ply throughout the year between this port and Muskegon, Ludington, and southern Lake Michigan ports.

Channels.—Milwaukee outer harbor is protected by a series of breakwaters which generally parallel the shore on either side of the mouth of Milwaukee River. The main entrance to the harbor is through a dredged channel which leads from deep water in Lake Michigan between the breakwaters across the outer harbor to the mouth of the river. A dredged anchorage basin extends southward from the entrance channel between the breakwater and the deep draft piers along the shore.

The inner harbor is entered from the outer harbor through the piers at the mouth of the Milwaukee River. In the inner harbor, channels have been dredged in Milwaukee River, Menomonee River, South Menomonee Canal and Burnham Canal leading off Menomonee River, and in Kinnickinnic River.

In 1977, the controlling depths were 29 feet from deep water in the lake between the breakwaters, thence 26 feet in the entrance channel through the outer harbor except for shoaling to 21 feet in the northwest corner, thence 27 feet in the outer harbor anchorage area except for shoaling to 25 feet in the northwest part.

In 1977, the controlling depths in the Milwaukee River were 26 feet at midchannel through the channel between the piers at the mouth, thence 21 feet at midchannel to the Chicago and North Western Railway bridge except for shoaling to 18 feet along the centerline extending south-southeast for 190 feet from the center pier of the bridge, thence 19 feet at midchannel to the junction with the Menomonee River, thence 14 feet to Buffalo Street bridge, thence 17 feet to the upstream limit of the Federal project at the North Humboldt Avenue bridge.

In 1977, the controlling depths in the Menomonee River were 19 feet from the junction with Milwaukee River to the head of the project 0.6 mile above the Sixteenth Street bridge.

In 1977, the controlling depths in South Menomonee Canal and Burnham Canal were 19 feet at midchannel.

In 1977, the controlling depths in Kinnickinnic River were 25 feet at midchannel from the junction with Milwaukee River to the Chicago and North Western Railway bridge except for shoaling to 18 feet along the centerline extending northeastward from the center pier of the bridge, thence 19 feet to the South Kinnickinnic Avenue bridge.

In the outer harbor, mooring to the breakwaters or piers is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by rock riprap along their sides.

In the outer harbor, the city of Milwaukee has dredged an 18-foot approach channel to the Municipal Passenger Pier north of the entrance channel. South of the entrance channel, the city has dredged the pier slips on the west side of the anchorage basin. South Slip No. 1 has been dredged to 26 feet and South Slip Nos. 2 and 3 have been dredged to 27 feet.

Disposal Area.—A diked disposal area extends from shore in the southwest corner of the outer harbor.

Anchorages.—Special anchorages are in the small-craft basins at the north end of the outer harbor and shoreward of the County Park Commission's breakwater which parallels the shore south of the outer harbor. (See 33 CFR 110.1 and 110.80 of Rules and Regulations, preceding.)

Submarine Cables.—A submarine power cable, extending from the north pierhead light to the north breakwater light, is located about 400 feet north of the center line of the entrance channel. Mariners are cautioned not to drop anchor in the vicinity of the cable and to keep well to the north in coming to anchor behind the north breakwater.

Aids to Navigation.—Milwaukee Pierhead Light is located on the outer end of the north pier. A fog diaphragm horn sounds as required.

Milwaukee South Pierhead Light is on the end of the south pier.

Milwaukee Breakwater Light is located on the southerly end of the north breakwater, north side of the harbor entrance. A fog diaphragm horn sounds as required and a radiobeacon is operated at this light station.

Breakwater Entrance South Side Light is located on the northerly end of the south breakwater.

North Entrance Light is located on the south side of the gap in the north breakwater about 1,000 feet south of the angle of the main and shore arms.

South Entrance Light is on the southerly end of the south breakwater and marks the north side of the entrance gap between the breakwater and the south shore connection. Only small craft should attempt to pass through this entrance.

South Shore Park Breakwater Light is on the northerly end of the city's south shore protection, 3,050 feet southwest of South Entrance Light.

Many privately maintained aids are located throughout the harbor area in addition to the aids established by the U.S. Coast Guard.

Dangers.—During rough weather, the entire breakwater system may be obscured by wave action. At these times, the only safe entrance is through the main entrance channel.

Bridges Across Milwaukee, Menomonee, and Kinnickinnic Rivers, at Milwaukee

No.	Location and name	Kind	Miles above mouth of Milwaukee River	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Milwaukee River								
0	Lake Freeway (I-794)	Highway	−0.06			200	120.0		Fixed. See Note 9.
	Junction—Kinnickinnic River.		0.16						
1	Chicago & North Western Transp. (Jefferson St.).	Railway	.34	87.5	87.7		7.3		See Note 1.
2	Broadway	Highway	.53			100	14.8		See Note 2.
3	Water St	do	.67			130	13.3		Do.
	Junction—Menomonee River		.77						
4	Buffalo St	Highway	.88			130	8.9		See Notes 2 and 8.
5	St. Paul	do	.95			50.0	14.5		Vertical lift. See Note 8.
6	East-West Exp. (Twin) I-794	do	1.01			116.0	28.14		Fixed.
7	Clybourn St	do	1.04			52.0	14.5		Vertical lift. See Note 8.
8	Michigan St	do	1.13						Vertical lift. Under construction in 1977.
9	Wisconsin Ave	do	1.23			50.5	12.8		See Notes 8 and 10. Vertical lift.
10	Wells St	do	1.35			77	9.0		See Notes 3 and 8.
11	Kilbourn Ave	do	1.45			100	14.6		See Notes 2 and 8.
12	State St	do	1.56			80	14.8		Do.
13	Juneau Ave	do	1.74			90	14.7		Do.
14	Park Freeway (Twin)	do	1.85			116.0	35.1		Fixed.
14A	Cherry St	do	1.97			80	14.7		See Notes 2 and 8.
15A	Pleasant St. bridge	do	2.25			50.5	14.5		Vertical lift. See Note 8.
16	Holton St. (viaduct)	do	2.52			79.2	64.7		See Note 2.
17	Humboldt Ave	do	2.90				17.0		Fixed; not lighted; head of navigation.
	Menomonee River and Canals								
	Junction		0.77						
18	Chi., Milw., St. P. & Pacific RR. (North Plankinton Ave.).	Railway	0.79	75			8.7		See Note 4.

See footnotes at end of table.

Bridges Across Milwaukee, Menomonee, and Kinnickinnic Rivers, at Milwaukee—Continued

No.	Location and name	Kind	Miles above mouth of Milwaukee River	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Menomonee River and Canals—Continued								
19	North Plankinton Ave	Highway	0. 82			75. 2	9. 1		See Note 2.
20	North Sixth St	do	1. 12			71. 0	30. 5		Do.
21	South Sixth St	do	1. 32			77. 5	30. 5		Across artificial South Menomonee Canal. See Note 2.
22	North-South Freeway I-94	do	1. 35			140	100		Fixed
23	Muskego Ave	do	1. 70			70	10. 0		See Note 2.
24	North-South Freeway I-94	do	1. 55			140	100		Fixed. Across artificial South Menomonee Canal.
25	Chicago, Milwaukee, St. Paul & Pacific RR. (Florida St.).	Railway	1. 53		65. 5		8. 6		Across artificial Burnham Canal. See Note 5.
26	North-South Freeway I-94	Highway	1. 62			95	80		Fixed. Across Burnham Canal.
27	South Eleventh St	do	1. 77	46	45		7. 9		Across Burnham Canal. See Note 1.
28	16th St	do	1. 89			120	35. 1		See Note 2.
29	Canal St	Railway	2. 67				9. 1		Fixed; not lighted; head of navigation.
	Kinnickinnic River								
	Junction		0. 16						
30	Chicago & North Western Transp. (foot Lapham St.).	Railway	1. 00	61. 6	61. 8		8. 1		See Note 1.
31	Kinnickinnic Ave	Highway	1. 45			100	10. 3		See Note 2.
32	Chi., Milw., St. P. & Pacific RR.	Railway	1. 49	93			15. 5		See Note 6.
33	Chi. & N.W. Ry. (between Kinnickinnic Ave. and South 1st St.).	do	1. 52	93			15. 5		See Note 7.
34	South First St	Highway	1. 61			70	14. 7		See Note 2.
35	Becher St	do	1. 84			50. 0	12. 6		Fixed. Head of navigation.

Whistle Signals for Opening Draws (condensed from detailed regulations, below); 3 shorts (— — —) for all bridges except 4 shorts (— — — —) for Nos. 18, 19, 31, and 33. Red ball elevated by day or the appearance of the red lights on top of bridge at night indicates that draw cannot be immediately opened. Bells at bridges acknowledge vessels signals, but do not indicate passage.

NOTE 1.—Swing bridge. Red light on each end of draw

piers; red light at each free end of protection piers; red light on each side of pivot piers; three lights on top of draw show red when bridge is closed and green when open.

NOTE 2.—Double-leaf bascule. Red light on each end of trunnion piers; one light on each side of free ends of each leaf shows red when bridge is closed and green when open.

NOTE 3.—Single-leaf bascule. Red light on each end of trunnion pier and lift pier; one light on each side of free end of leaf shows red when bridge is closed and green when open.

NOTE 4.—One-arm swing opens upstream, turntable abutting right dock. One red light at each end of right protection pier; one red light at upstream corner of left approach pier; three lights on top of draw show red when bridge is closed and green when open.

NOTE 5.—Swing. One red light on west draw pier; one red light on channel side of pivot pier; one red light on end of each protection pier on channel side; two lights on top of drawspan show red when bridge is closed and green when open. Two-hour advance notice for opening of this bridge is required; telephone 271-6120, ext. 359, Milwaukee, Wis.

NOTE 6.—Swing. One red light on north draw pier; one red light on north side of pivot pier; one red light on west end of each protection pier; two lights on top of drawspan show red when bridge is closed and green when open. Two-hours advance notice for opening of this bridge is required; telephone 271-6120, ext. 359, Milwaukee, Wis.

NOTE 7.—Swing. One red light on each side of south draw pier; one red light on channel side of pivot pier; one red light on each end of channel protection pier on channel side; three lights on top of drawspan show red when bridge is closed and green when open.

NOTE 8.—For bridges 4, 5, 7 to 13, 14A, 15A (Buffalo St. and upstream) two-hours advance notice for opening of these bridges is required; telephone 278-2150, Milwaukee, Wis., or contact Maritime Mobile Radio Units K2N 488, Broadway Bascule Bridge, City of Milwaukee, or KW 4448, City of Milwaukee Bridges, Milwaukee, Wis.

NOTE 9.—Clearance under center 200 feet is 120.1 feet. Minimum vertical clearance at channel limits is 96.0 feet.

NOTE 10.—Vertical clearance under bridge center when open is 28 feet.

Caution.—Fish nets in the north outer harbor are a hazard. A water intake for a sewage disposal plant is on the south side of the channel about 800 feet west of the Interstate 794 highway bridge and may, at times, cause hazardous crosscurrents for small vessels.

Navigators are advised to use extreme caution when entering slips of the general cargo terminals in the outer harbor. Ships accidentally penetrating the dock wall or ships having a large rake angle of the bow can strike the steel and concrete superstructure of Interstate 794 highway bridge. This could result in heavy ship or bridge damage and possible personal injury or loss of life.

Ferries.—A ferry crosses the Kinnickinnic River at the northwest end of Jones Island. An automobile and railroad car ferry operates between Milwaukee and Ludington from a terminal on the west side of Jones Island about 0.5 mile southwest of South Pierhead Light. A railroad car ferry operates from this terminal between Milwaukee and Muskegon.

Harbor Facilities.—The **Milwaukee River**, flowing down from the north, is joined about ⅝ mile above the inner ends of the piers by the **Menomonee River**, entering from the west, and just inside of the south pier by the **Kinnickinnic River**, entering from the south. These rivers constitute the inner harbor of Milwaukee. The current in the rivers varies from 0 to 3 miles per hour. The channels are narrow, tortuous, and not provided with turning basins; several of the bridge openings are also narrow, and their navigation is quite difficult.

The Milwaukee River is navigable for about 2.9 miles, with average width of about 225 feet. The Menomonee River is navigable for about 1.9 miles, with an average width of about 140 feet. The Kinnickinnic River is navigable for about 1.84 miles with a width of from 150 to 200 feet. The Municipal Mooring Basin, used primarily for winter moorage of large vessels, adjoins Kinnickinnic River about 1 mile south of the entrance channel, out of the lane of vessel traffic.

Practically all services including boat lifts with a 15-ton capacity, are available for small craft adjacent to the two Small Craft Anchorage Areas.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Milwaukee is contained in the **Port Series No. 47** (Revised 1972), published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Coast Guard Station.—Milwaukee Coast Guard Station, Group Office, and Base are at the south end of the outer harbor about 0.8 mile southwest of South Entrance Light.

Marine Weather Broadcast.—The National Weather Service provides continuous weather broadcasts on frequency 162.40 MHz with a power of 1,000 watts from radio station KEC-60. The station is at Delafield, Wisconsin, about 25 miles west-northwest of Milwaukee Harbor entrance, and has a range of about 50 miles.

The taped transmissions include the latest forecasts, weather summaries, temperature round-ups, severe weather data, and Lake Michigan weather reports and forecasts during the boating season. During severe weather occurrences, normal messages are replaced by releases concerning the severe weather. During critical weather developments, the Weather Service can transmit a distinctive, audible tone alert signal for 3 to 5 seconds. The frequency of the tone is 1,050 Hertz (cycles per second). A test of the tone-alert facility is conducted each Wednesday at 12 noon.

A VHF/FM signal from transmitting antenna to re-

ceiver must be a direct line-of-sight for best reception providing the receiver is within range of the transmitter power. Normally a receiver with one microvolt sensitivity should receive the signal reliably out to a line-of-sight range of 50 miles.

Captain of the Port Areas.—See 33 CFR § 3.45–85 of Rules and Regulations, preceding.

Anchorage Regulations.—See 33 U.S.C. 258 (See Rule 9 of Pilot Rules published by the U.S. Coast Guard and available from the 9th U.S. Coast Guard, Cleveland, Ohio) and 33 CFR § 110.1 and § 110.80 of Rules and Regulations, preceding.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding and 33 CFR §117.655 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

Caution.—Navigators are advised to use extreme caution when entering slips of the General Cargo Terminals in the outer harbor. Ships accidentally penetrating the dock wall or ships having a large rake angle of the bow can strike the steel and concrete superstructure of Interstate 794 Highway Bridge which could result in heavy ship-bridge damage and possible personal injury or loss of life.

Local Harbor Regulations are enforced by the **harbormaster.** Copies of these regulations may be obtained from the Legislative Reference Bureau, Room 404, City Hall, 200 East Wells Street, Milwaukee, Wisconsin 53202.

* * * * *

Bridge Regulations

Sec. 8–38. All vessels, craft or floats, while navigating, lying or being within that part of Milwaukee which is within the limits of the city of Milwaukee, or while navigating, lying or being within any of the rivers or navigable waters within the limits of said city, are hereby prohibited from blowing any steam whistle, for any purpose whatever, except that when it shall be necessary for them to pass through any bridge within the limits of the said city, other than the bridge across the Menomonee river at the foot of N. Plankinton Avenue, the railroad bridge located about one-half block east of the last-mentioned bridge, the railroad bridge of the Chicago and Northwestern railroad across the Kinnickinnic River between Kinnickinnic Avenue and South First Street, and Cherry Street Bridge and Kinnickinnic Avenue Bridge, they may give three short blasts of the whistle, each blast not to exceed 2 seconds in length, as a signal for such bridge to open; and as a signal for opening the above-mentioned bridge across the Menomonee River, and the said two railroad bridges, and said Kinnickinnic Avenue Bridge, they may give four short blasts of the whistle, each blast not to exceed 2 seconds in length; and as a signal for opening Cherry Street Bridge they may give two short blasts of the whistle, each blast not to exceed 2 seconds in length; provided, however, that no tug, propeller or steamboat shall sound her whistle while occupying the draw of any bridge in this city, or within 100 feet thereof, unless the same shall be blown by a steamer, propeller or tug lying at a dock, as the signal for the opening of the next nearest bridge; provided, however, that in the event of a fire occurring on board any vessel, except vessels under way, or on the dock to which such vessel is moored, such vessel may sound five prolonged blasts of from 4 to 6 seconds duration each on the whistle or siren as an alarm indicating such fire. Such signal may be repeated at intervals to attract attention. It shall be illegal to use such signal for any other purpose. Such signal shall not be used as a substitute for, but may be used in addition to, other means of reporting a fire. Nothing contained herein shall be construed to prohibit the blowing of whistles by any vessel, craft, or float in compliance with applicable Federal or State law or rules.

Penalty

Sec. 8–39. The owner or other person in charge of any vessel, craft or float, or any other person violating any of the provisions of the foregoing sections of this article, unless otherwise provided, shall upon conviction thereof be fined not less than $10 or more than $100 for each offense; and the obstruction of any channel in violation of the terms of this article for each period of 24 hours or part thereof shall be considered a separate offense. Every vessel, craft or float, whose owner, master or other person in charge shall become liable as herein provided, shall also be chargeable with the payment of said penalty, and the same shall be and constitute a lien upon such vessel, craft or float, to be enforced as provided by law.

Injury to Bridges, etc.

Sec. 8–40. Whenever any person having charge of any vessel, craft or float shall wish to move the same through the draw of any bridge, reasonable time shall be allowed for the opening of the same; and any person who shall move any vessel, craft or float against any bridge or the center or protection piers thereof, before the same shall be opened, to the injury thereof, and any person who shall otherwise, through willfulness or negligence, run any vessel, craft or float into any of the piers, cribs or docks of the harbor at the straight-cut, or into any bridge or abutment thereof, or allow such vessel, craft or float to be driven or run into such piers, cribs, docks, bridge or abutment, or who shall take any stones from the crib for ballast or any other purpose, shall be subject to a penalty of $500 for each offense, and shall in addition be liable for all damages thus caused. Any vessel, craft or float, whose owner, master or other person in charge shall become liable as aforesaid shall also be chargeable with the payment of the said penalty and the said damages, and said amounts shall be and constitute a lien on said vessel, craft or float, to be enforced as provided by law.

Delay at Bridges; Hours During Which Closed

Sec. 8–48. Whenever, between the hours of 6 a.m. and 8 p.m. persons, teams or vehicles have been delayed at said bridges 5 minutes by reason of said bridges being open for vessels to pass, it shall be the duty of the bridge-tenders or other persons in charge of the bridge or bridges, to raise the signal ball and immediately close the same

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and keep the same closed for fully 5 minutes for such persons, teams or vehicles to pass over, if so much time shall be required, when the same shall be opened again and be kept open (if necessary for vessels to pass) for the like period; provided, however, that bridgetenders shall not open or swing any city swing, draw or bascule bridge across the Milwaukee, Menomonee or Kinnickinnic rivers or S. Menomonee canal or Burnham canal or the Milwaukee river south of and excluding the Buffalo Street bridge (bridges across the Milwaukee river north of and including the Buffalo Street bridge are hereinafter provided for) between 7:30 and 8:30 a.m. and 4:30 and 5:30 p.m.; provided further, that the exceptions as to hours stated above shall not apply to vessels having a license to carry 50 or more passengers when proceeding to or from their regular landing places on their regular trips, nor to vessels carrying United States mail, nor to fireboats of the city of Milwaukee, nor to vessels belonging to the United States; provided further, that the exceptions as to hours stated above shall not apply on Sundays and the following legal holidays: New Year's Day, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, and Christmas Day, or on the Monday following any such holiday when it occurs on a Sunday; provided further, that for all bridges owned and operated by the city of Milwaukee across the Milwaukee river north of and including the Buffalo Street bridge, the bridge tender shall immediately open the above-mentioned bridges for the passage of foreign vessels and vessels of the United States as defined by Section 4311 of the Revised Statutes (of the United States) at all times during the day or night except between the hours of 7:30 a.m. and 8:30 a.m. and 4:30 p.m. and 5:30 p.m., only upon advance notice given by telephone or otherwise to the superintendent of the bureau of bridges, city hall, Milwaukee, at least two hours in advance of the time the vessel desires to pass through a draw upon signals to be given by three short blasts of a horn, steam whistle or other approved signaling device; and provided further, that the exception to hours and advance notice stated in the preceding provision shall not apply to fireboats of the city of Milwaukee, nor to vessels belonging to the United States. The hours and time referred to in this section shall be central standard time; provided, however, when central daylight saving time is in effect, the hours and time referred to shall be central daylight saving time. (Am. Ord. 113, F # 59-437-a, passed June 9, 1959.)

Signaling Apparatus on Bridges and Abutments

Sec. 8-49. The commissioner of public works is hereby required to provide, construct and arrange in the best and most practicable manner at each of the several bascule and swing draw bridges over the Milwaukee, Menomonee and Kinnickinnic Rivers and all other navigable waters of the city of Milwaukee the following signal apparatus:

On every swing draw bridge a red light on each end of the draw piers, a red light placed as low as practicable on each free end of each protection pier, and a red light on each side of the pivot pier. The red lights on the sides of the pivot piers shall be placed where the pier is crossed by the axis of the bridge and below the floor level of the same. There shall also be placed on each of said swing draw bridges three square lanterns on the top of the draw span, which shall be raised 15 feet above the top of the draw, and each shall show green along the axis of the draw and red at right angles to the axis. The said lanterns shall be so placed that when the draw is shut there will be shown up and down stream three high red lights above the permanent low lights; when open, green lights will be seen in line up and down the stream with the permanent red lights showing the width of the openings.

On every bascule bridge a red light on each end of the roller piers placed as low as practicable, and on each lift near the point where they touch and on the upstream and downstream sides a square lantern suspended free to swing behind a frame containing a circular panel of red and green colored glass, the frame to be attached to the end of each lift. Said last mentioned lights shall be so constructed, placed and arranged that when the bridge is closed there will be shown on the upstream and downstream sides two red lights close together in the center of the bridge and above the permanent low red lights; when completely open, two green lights will be seen at an elevation on each side of the opening and above the red lights, the latter showing the width of the opening. All of the lights hereinbefore mentioned shall be permanent.

On each abutment of all of the several bascule bridges a red ball and a bell, on each swing drawbridge, at or near the center thereof, a red ball and a bell. Each such ball shall be attached to a staff in such manner that the ball may be raised and lowered; such staff to be erected in the case of bascule bridges on the bridge houses thereof, and in the case of swing drawbridges on the superstructures thereof. Such ball shall be of such size and so placed that when elevated it can be readily seen from the river both above and below the bridge. Each such bell shall be of such size and so placed as to be heard a distance of 600 feet both above and below the bridge.

Ringing of Bells Upon Signal From Vessel

Sec. 8-50. Whenever any vessel approaching any of said bridges shall give the signal for the opening thereof, and such vessel shall be within 600 feet from such bridge, the bridgetenders on each side of such bridge, if it be a bascule bridge, or the bridgetender in the center thereof, if it be a swing drawbridge, shall ring the bell or bells thereon. In case any such vessel when giving the signal for the opening of such bridge shall be more than 600 feet from such bridge, the bridgetender on each side of such bridge, if it be a bascule bridge, or the bridgetender on the center thereof, if it be a swing drawbridge, shall ring the bell or bells thereon before such vessel reaches a point 600 feet from such bridge. In case the bridgetender on any bridge shall know that for any reason such bridge cannot be opened, he shall not ring the bell thereon.

Signal Preparatory to Opening

Sec. 8-51. The ringing of the bell at the center of any swing drawbridge, or ringing of the bells on both abut-

ments of any bascule bridge in answer to the signal from any vessel for the opening thereof shall be a signal to such vessel that the bridgetenders thereon are at their proper posts of duty and have heard the signal on such vessel, but shall not be construed to be a signal that such bridge will be opened for the passage of such vessel.

Opening of Bridge Upon Signal

Sec. 8-52. Whenever any vessel shall have signaled for the opening of any such bridge, and the bridgetenders thereon shall have rung the bells thereon as provided in section 8-50, the bridgetender or bridgetenders shall start to open such bridge before the distance between such vessel and such bridge shall have become shorter than the the distance within which such vessel can be stopped, provided that such bridgetender or tenders shall not start to open such bridge until the same shall have been cleared of all persons using such bridge as a highway.

Penalty

Sec. 8-53. Every bridgetender or other person in charge of any such bridge who shall fail or neglect to promptly raise or lower such bridge signal ball as provided in section 8-50 hereof, or who shall knowingly or intentionally fail or neglect to open any such bridge as provided in section 8-52 thereof, shall upon conviction thereof be punished by a fine or not less than $5 nor more than $10, or by imprisonment in the House of Correction of Milwaukee county for not to exceed 30 days.

Signal for Open and Closed Bridge at Day Time

Sec. 8-54. Whenever any such bridge shall be opened in the day time for the passage of any vessel, the bridgetender or bridgetenders thereon shall lower the signal ball or balls thereon immediately after such bridge shall start to open. Before starting to close such bridge the bridgetender or tenders thereon shall raise such ball or balls. Such balls shall be raised at all times except as above provided in this section.

Signal To Proceed at Day Time

Sec. 8-55. The lowering of such ball shall be the signal to such vessel that such bridge will be opened and that such vessel may proceed toward such bridge; but no act on the part of any bridgetender or any other person in the day time other than the lowering of such ball or balls shall be construed to be an invitation to any vessel to proceed to and through such bridge or as an indication that such bridge will be opened.

Signal To Proceed at Night

Sec. 8-56. Whenever any vessel shall approach any swing drawn bridge in the nighttime, the appearance of the three green lights in a line up and down stream above the draw of such bridge shall be a signal to proceed to and through such bridge.

Whenever any vessel shall approach any bascule bridge in the nighttime the appearance of the green lights at the top of each side of the openings and above the low red lights shall be the signal to proceed to and through said bridge.

No act upon the part of any bridgetender or any other person in the nighttime, other than the appearance of said green lights as provided in this section shall be construed as an invitation to any vessel to proceed to and through such bridge, or as an indication that such bridge will be opened.

Limit of Approach for Vessels Before Signal To Proceed

Sec. 8-57. It shall be unlawful for the owner or owners, officer or officers, or other person, or persons in charge of any vessel or vessels navigating the navigable waters of the city of Milwaukee to approach any nearer to any of the bridges over the said rivers than to a point at a distance from such bridge within which such vessels can be stopped without colliding with such bridge while said signal balls are up or elevated in the daytime, or while said green lights are not displayed in the nighttime.

Penalty

Sec. 8-58. Any person or persons who shall violate any of the provisions of section 8-57 shall be chargeable with whatever damage may result to the city by reason of any such violation, and shall also be subject to a penalty of $100 for each and every violation; and in case the same person or persons shall violate such provisions, or any of them, a second or more times, the court before which the trial is had may, in addition to the penalty or fine authorized as aforesaid, also imprison such offender or offenders not exceeding 3 months.

Closing Bridges Against Vessels

Sec. 8-59. Bridgetenders or persons in charge of bridges shall not close the same against vessels seeking to pass through until as may be deemed necessary by the commissioner of public works, passengers, teams or vehicle have been delayed 5 minutes by the bridge being open.

Bells To Be Rung Before Opening

Sec. 8-60. It shall be the duty of the several bridge tenders of the city before opening the bridges, or either of them for any purpose whatsoever, to ring the bell or bells thereon.

Ringing of Bell Warning Signal

Sec. 8-61. The ringing of the bell or bells on any of the bridges referred to in section 8-49 shall be a warning and signal to all persons approaching such bridge on the highways leading thereto that said bridge is about to be opened, or is open, and that it is dangerous to proceed toward said bridge.

Driving on Draw After Signal Prohibited

Sec. 8-62. Any person or persons who shall walk or attempt to walk, or who shall drive or attempt to drive, on the draw of the aforesaid bridges with a team of any description, either double or single, or who shall ride or

attempt to ride on the draw on the aforesaid bridges with a horse or other animal, or propel any automobile, bicycle or other similar vehicle on the draw of the aforesaid bridges, after the tender of such bridge has commenced to give the signal for swinging or opening the bridge, shall be deemed guilty of an offense, and shall be liable to a fine of not more than $5 nor less than $1 for each and every such offense, or to imprisonment in the House of Correction of Milwaukee county for not more than 30 days, in the discretion of the court.

Loitering on Bridges

Sec. 8-63. Any person or persons who shall stand or sit or loiter on any of the aforesaid bridges or the abutments or railing appertaining to the same, provided that the bridge is in passable condition shall be deemed guilty of an offense and shall be liable to a fine of not more than $5 nor less than $1 for each and every violation of this section, or to imprisonment in the House of Correction of Milwaukee county for not more than 30 days, in the discretion of the court.

Meddling With Bells

Sec. 8-64. Any person or persons who shall ring or meddle with the bell or bells on any bridge, except the several bridgetenders, shall be deemed guilty of an offense, and shall be liable to a fine of not more than $10 nor less than $1 for each and every violation of this section, or by imprisonment in the House of Correction of Milwaukee county for not more than 30 days, in the discretion of the court.

Police To Preserve Order

Sec. 8-65. Any member of the police department is hereby empowered to give any direction for the preservation of good order and the equal convenience of the public, on or near any bridge in the city of Milwaukee; and any person refusing or neglecting to obey such order shall be subject to arrest, and upon conviction shall pay a fine of not less than $5 nor more than $50 with the costs of prosecution, or may be imprisoned in the House of Correction of Milwaukee county for not more than 60 days, in the discretion of the court.

Bridgetenders To Report Defective Places

Sec. 8-66. The bridgetenders shall immediately report all defective and dangerous places upon their respective bridges and the approaches thereto, which shall come to their notice, and in the performance of their duties they shall particularly examine such bridges and the approaches thereto, and make such report as aforesaid. Such report shall be made to the superintendent of bridges and public buildings, who shall forthwith transmit said report to the office of the commissioner of public works.

Duty of Superintendent of Bridges

Sec. 8-67. It shall be the duty of the superintendent of bridges and public buildings, under the direction of the commissioner of public works, to repair and keep in repair all bridges belonging to said city, and to do and perform such other and further work and to employ such men in the prosecution of said work, under the direction of the commissioner of public works, as may be necessary.

Commissioner of Public Works To Enforce

Sec. 8-68. It shall also be the duty of the commissioner of public works, so far as in his power, to see that the provisions of this article are fairly and faithfully observed; and when necessary he shall call upon the chief of police for aid to enable him to do so.

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(7) Speed Restrictions

(a) **Speed to be Reasonable and Prudent.** No person shall operate a motorboat at a speed greater than is reasonable and prudent under the conditions and having regard for the actual and potential hazards then existing. The speed of a motorboat shall be so controlled as to avoid colliding with any object lawfully in or on the water or with any person, boat or other conveyance in or on the water in compliance with legal requirements and exercising due care.

(*b*) **Speed Limits for all Boats.**

1. No person shall operate a motorboat at a speed in excess of 5 miles per hour while in the following areas:

a. The inner harbor as defined in Section 8-80(1)(g).

b. The approved north area anchorage at the north end of the outer harbor. This area is bounded as follows: Beginning at the shoreward face of the north breakwater at a point 500 feet northerly from the north end of the fair weather entrance; thence 270°, 1,100 feet to a point marked by an anchorage buoy; then 215°, 1,700 feet to a point marked by an anchorage buoy; thence 270°, approximately 2,000 feet, to the lakeward face of the lakeshore revetment at a point approximately 1,200 feet northerly from the landing pier for small boats in the vicinity of East Wisconsin Avenue extended; thence following lakeward face of said revetment and the shoreline northeasterly to the shoreward or southwesterly face of the United States breakwater; thence southerly along the shoreward face of said breakwater to the point of beginning.

c. The area bounded by East Russell Avenue extended on the north; the rubble mound breakwater on the east; an imaginary line extending from the south end of the opening in the rubble mound opposite East Meredith Street to the South Shore Bathhouse on the west; thence northerly along the shoreline to East Russell Avenue extending on the north.

2. No person shall operate a motorboat at a speed in excess of 10 miles per hour while in that area of the outer harbor between the shoreline and a line parallel to the shoreline 2,000 feet east of said shore; except that in the main harbor entrance channels no motorboat shall be operated at a speed in excess of 4 miles per hour.

3. No person shall operate a motorboat at a speed in excess of 4 miles per hour when entering or leaving the harbor.

4. No restrictions on speed shall be imposed on a per-

son operating a motorboat in the following areas (except where such speed would be in violation of other applicable sections of this ordinance):

a. All water east of an imaginary line 2,000 feet easterly of the shoreline and parallel to said shoreline except the north anchorage area and the main harbor entrance channels.

b. The water between the shoreline and rubble mound bounded on the north by an imaginary line extending from the south end of the opening in the rubble mound breakwater opposite of East Meredith Street to the South Shore Bathhouse and bounded on the south by the city limits. The speed of all motorboats shall not exceed 5 miles per hour upon entering or leaving the aforesaid opening in the rubble mound breakwater opposite said East Meredith Street.

c. Subsection (b) shall not apply to aquatic events or exhibitions sanctioned by permit.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The old Milwaukee waterworks crib, a concrete structure with roof about 10 feet above the water, is located 2,825 feet 146° from North Point Light. It is privately lighted, as it is out of the line of navigation, and there is shallow water with rough bottom directly inside of it. There are two abandoned intake pipes extending about 5,000 feet lakeward from the old Milwaukee waterworks crib to intakes with 52 feet of water over the cribs. They are not marked.

North Point, Wis.—North Point Light, about 3 miles north of Milwaukee Breakwater light, shown 154 feet above the water from a white octagonal tower with a red roof, marks the north end of Milwaukee Bay.

Caution.—A small arms firing range is located on the lakefront about 1,800 feet northeast of North Point Light. Daily firing creates a caution zone extending 1,200 feet southeasterly into Lake Michigan. The zone is 1,200 feet wide at its outer end and 500 feet wide at the shoreline. Guards are posted to signal cease firing when necessary but mariners are advised to consult the U.S. Coast Guard Ninth District Notices to Mariners for schedule of firing and instructions.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The submerged crib of the Linwood Avenue intake of the Milwaukee waterworks is located about 6,500 feet from the shore and 9,000 feet 049° 45′ from North Point Light. There is about 53 feet depth over this crib. Vessels are cautioned not to anchor in the vicinity of the submerged crib.

A TV mast and a TV tower, both lighted, are about 2.4 miles northwest of North Point Light and are very prominent from offshore.

In Whitefish Bay, Wis., which is a slight recession about 6 miles across between Milwaukee North Point, and Fox Point, the shore bank is about ⅝ mile wide, with submerged net stakes about ⅞ mile out at the middle of the bight.

Chart 14904.—Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. An intake, with its top submerged to a depth of 30 feet, is located in 40 feet of water about 3,950 feet off shore from a point at foot of Belle Avenue, Whitefish Bay.

Around **Fox Point**, shoals make out ⅝ mile with but 5 feet near the outer edge of the bank east of the point. At several places in the 15-mile stretch between Fox Point and Port Washington, reefs extend from the shore to distances of from ½ to 1 mile, with limiting depths of 10 to 12 feet at the outer limits. The land bordering the shore south of Port Washington is a steep bluff having an average elevation of about 100 feet.

Wreck.—A wreck is located about 3½ miles northerly of Fox Point and about 3,000 feet from the shore in about 12 feet of water. There is a depth of one foot over the wreck. It is not marked.

Between Whitefish Bay and Port Washington, the charted bell tower about 6 miles north of Fox Point is reported to resemble a spire and is helpful in navigating this stretch of the coast.

Port Washington Harbor, Wis.—This harbor, located about 29 miles north of Milwaukee Harbor, is entirely artificial. Sauk Creek, a very small stream, enters the harbor at the inner end of the coal wharf on the south side.

Prominent Features.—The radio masts close to the shore just south of the city, the powerplant stacks, and spires northwest of the inner end of the north breakwater are prominent in the area.

Channels.—A dredged entrance channel leads from deep water in Lake Michigan to an outer basin protected on the north by a breakwater and on the south by a breakwater and coal pier. From the west end of the outer basin, the channel leads to two inner basins. In 1977, the controlling depths were 21 feet from deep water in the lake through the outer basin except for depths of 18 feet in the westerly 800 feet, thence 13 feet in the west inner basin, and 16 feet in the north inner basin. Between the south limit of the outer basin and the coal pier, depths were 21 feet to within 20 feet of the pier face.

Power company cooling water is discharged into the harbor in the vicinity of Sauk Creek and creates a very dangerous current across the entrance to the west inner basin. Extreme caution should be exercised when maneuvering in this vicinity. With 30 minutes advance notice of vessel arrival in the harbor, the Wisconsin Electric Power Co. will reduce cooling water discharge at the request of the vessel master and will make arrangements to handle lines when entering or leaving harbor. The power company can be contacted via the marine operator or by land telephone on (414) 284-5161, 24 hours a day.

Aids to Navigation.—Port Washington Breakwater Light is on the southeasterly end of the north breakwater; a fog diaphragm horn sounds as required. South Breakwater Light is located on the outer end of the south

breakwater at the harbor entrance. Port Washington Pierhead Light is on the outer end of the north stub pier.

Private lights are maintained by the Wisconsin Electric power co. as follows: South Pier Light, on the outer or easterly end of the coal wharf, and South Protection Jetty Light, on the outer end of a rubble stone mound south of the coal wharf.

Private Improvement of Harbor.—The Wisconsin Electric power co. has constructed on the south side of the outer harbor, a coal wharf of steel sheet piling 1,175 feet long, extending about 870 feet beyond the outer end of the north stub pier; its outer end is distant about 70 feet and its inner end about 115 feet to the south of the south line of the Government entrance channel. The company has also constructed a rubble mound to lakeward in extension of the coal wharf, parallel to and 75 feet south of the prolonged line of the harbor face of the wharf, and extending about 550 feet southeasterly connecting with the inner end of the south breakwater.

The above company has dredged and is obligated to maintain the area between the south line of the Government entrance channel and the harbor face of the coal wharf to a depth of 22 feet, and has diverted Sauk Creek into the harbor.

Harbor Facilities.—There are no supplies or repair facilities for large vessels at Port Washington. Small-craft facilities are limited but do include berthing, gasoline, water, electricity, launch ramps, lodging, and pump-out facilites.

Anchorage Regulations.—See 33 CFR § 110.1 and § 110.79 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

In the reach from Port Washington to Sheboygan, about 27 miles northeasterly, the coast is bold and clear of shoals to within ½ mile of the shore, but numerous net stakes exist in the deep off-lying waters for a maximum distance of 2 miles out.

Caution Area.—Special Use Airspace, as noted in Federal Regulations 14 C.F.R. Part 73 (Federal Aviation Adm., Dept. of Transp.), Special Use Airspace, consists of the area above the surface of the earth as outlined by geographic coordinates and is to be used and controlled for specific purposes in the operation of aircraft. Area R-6903, Sheboygan, Wis., beginning at 43° 19′ 00″ N., 87° 41′ 00″ W.: to 44° 05′ 30″ N., 87° 29′ 45″ W.: to 44° 02′ 00″ N., 87° 02′ 30″ W.: to 43° 15′ 30″ N., 87° 11′ 00″ W.; to the point of beginning may be used for military purposes from the surface to a flight level of 45,000 feet. The using agency is the Commander, Volk Field, Wis., and the time of designation is continuous, sunrise to sunset. The Controlling Agency is the Federal Aviation Administration, Chicago ARTC Center.

Mariners are cautioned to consult each U.S. Coast Guard Ninth District Notice to Mariners for additional information, firing schedules and changes.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations preceding. A water intake pipeline extends from a point on shore about 100 feet north of the shore end of the Port Washington north breakwater, 3,900 feet 090° to an intake crib in more than 35 feet of water. The depth of water over the crib is 32 feet. The crib is not marked. A second water intake pipeline extends from a point on shore about 50 feet further north 2,500 feet 090° to an intake crib in more than 30 feet of water The crib has 22 feet of water over it and is not marked.

Charts 14904, 14903.—Wreck.—The wreck of an unidentified vessel, with at least depth of 26 feet over it, is located about 0.7 mile offshore of a point about 8 miles northeast of Port Washington.

Chart 14903—Sunken Caisson.—On June 19, 1914, a concrete caisson 54 feet long, 20 feet wide, and 18 feet high, belonging to the United States, sank in 28 feet of water about 8 miles southwesterly from Sheboygan pierheads and about 2,900 feet offshore. Examination made November 12, 1924, showed 16 feet of water over the highest part of the caisson. It is not marked.

Water Intakes.—The Wisconsin Power & Light Co. maintains two lights to mark their Sheboygan Generating Station Intake Cribs about 2¼ miles southerly of Sheboygan Breakwaters. The North and South Intake Lights, 48 feet above the water, are shown from red skeleton towers mounted on the separate concrete intake wells about 280 feet apart.

The charted tanks at Belgium, Cedar Grove, and Oostburg are useful in navigating between Port Washington and Sheboygan.

Charts 14903, 14922—Sheboygan Harbor, Wis.—This harbor is located at the mouth of Sheboygan River, about 55 miles north of Milwaukee Harbor.

Channels.—A dredged entrance channel leads northwestward from deep water in Lake Michigan between a breakwater on the north and a pier on the south to an outer harbor turning basin. The channel leads across the south side of the basin to the mouth of Sheboygan River and thence upstream for about 1 mile.

In 1976, the midchannel controlling depths were 18 feet through the entrance channel to the outer basin, thence 18 feet in the outer basin, thence 17 feet from the mouth of the river to the Eighth Street bridge, thence 6½ feet to the head of the project at Jefferson Street.

The entrance channel is subject to shoaling caused by the drift of sand from the south.

Currents in the river attain velocities up to 3 m.p.h.

The outer basin is not adapted for anchorage, but greatly reduces wave action in the lower river. Mooring to the breakwater or piers is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Aids to Navigation.—Sheboygan Breakwater Light is on the southeasterly end of the breakwater; a diaphragm foghorn sounds as required. Sheboygan South Pierhead Light is on the outer end of the pier. North Pierhead Light is on the stub end of the north pier. A marker radiobeacon is operated at the Coast Guard station.

Sheboygan is a **Customs Port of Entry.** The nearest customs agent is at Milwaukee.

Coast Guard Station.—Sheboygan Coast Guard Station is located near the inner end of the north-pier stub.

National Weather Service Warning Display Station.—Signals are displayed from a steel tower at the Coast Guard Station.

Bridge Regulations.—See 33 U.S.C. 499 in Certain Laws, preceding and 33 CFR § 117.652 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

Local Harbor Regulations are enforced by the **harbormaster** who can be reached through the Department of Public Works, City Hall, Sheboygan, Wisconsin 53081. A **speed limit** of 4 m.p.h. is enforced within the harbor limits. Copies of the regulations may be obtained from the harbormaster.

Harbor Facilities.—The only commercial wharves are at The C. Reiss Coal Co. along the south bank near the mouth of the Sheboygan River. Small-craft facilities include berthing, gasoline, diesel fuel, water, electricity, launching ramps, lifts and cranes capable of hauling out craft up to 35 feet, limited marine supplies, pump-out station, and limited hull and engine repair.

* * * * *

Bridge Regulations

4.04 Bridgetenders.—The bridgetenders shall have such duties as are required by ordinance and which the council may direct.

It shall be the duty of each bridgetender to make complaint in writing before the municipal court of the city of Sheboygan against any person violating any provision of this chapter whenever such violation shall come to his knowledge.

Structures Across the Sheboygan River at Sheboygan

No.	Location and name	Kind	Miles above North Pierhead Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Submerged pipeline		0.48						
2	do		.60						
3	Submerged cable		.68						
4	South Eighth St. bridge	Highway	.69			99.0	10.8		See Note 1.
5	Submerged cable		.75						
6	Submerged pipeline		.76						
7	Aerial cable		.77						
8	do		.86				141.2	137.2	Wisc. Power & Light Co.
	Upstream Federal project limit.		1.07						
9	Pennsylvania Ave. bridge	Highway	1.14			38.0	19.7		Fixed.* New in '73.
10	Aerial cable (west channel)		1.22						
11	Aerial cable		1.56						
12	Chicago & Northwestern Ry. bridge.	Railroad	1.57	60.0	60.0		20.0		Fixed. Not lighted.
13	Aerial cable		1.64						
14	S. Fourteenth St. bridge	Highway	1.65			54.0	14.3		Fixed. Not lighted.
15	Submerged pipeline		1.66						
16	Aerial cable		1.86						
17	Chicago & Northwestern Ry. bridge.	Railroad	2.29						
18	Aerial cables (2)		2.35						
19	Submerged pipeline		2.40						
20	New Jersey Ave. bridge	Highway	2.41						
21	Submerged pipeline		2.79						

* Lighted in accordance with 33 CFR, Part 68, and Note, in Rules and Regulations, preceding.

Signal for Opening Draw, 2 blasts, 1 long, 1 short.

NOTE 1.—Double-leaf bascule. Red light on each end of each roller pier; light on each side of free end of each leaf shows red when bridge is closed and green when open.

Each bridgetender shall forthwith report in writing to the board of public works any defect or damage done to any bridge or any part thereof.

The bridgetenders of the city shall severally and respectively have and exercise police powers in the performance of their duties. * * *

(7) **Passing Through Bridges.**—All watercraft navigating the Sheboygan River and harbor or other navigable waters connected therewith within the limits of the City of Sheboygan, when passing any bridge in said city, shall move or be moved past the same as expeditiously as is consistent with the proper use of the river by other watercraft; but in no case shall any watercraft, while passing through any bridge, remain or obstruct the passageway more than 5 minutes, and no watercraft shall be so anchored or fastened as to prevent any bridge from a free and speedy opening. Any master or other person having charge of any watercraft, who shall violate any provisions in this section, shall forfeit and pay for each offense a penalty of not less than $5 nor more than $25.

(8) **Time Allowed for Opening Bridge.**—Whenever any person having charge of any watercraft shall wish to move the same past any bridge, reasonable time shall be allowed for the opening of the same; and any person who shall move any watercraft against any bridge, or the center or protection pier thereof, before the same shall be opened, to the injury thereof, shall forfeit and pay for each offense a penalty of not less than $5 nor more than $50, and shall likewise be liable to the city of Sheboygan for all damages done to the bridge and center or protection piers thereof. * * *

The ports of Sheboygan and Manitowoc, Wis., are about 24 miles apart with the towns of Cleveland, Wis. and Northeim, Wis. (formerly known as Nordheim), along this stretch of shore.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 CFR § 1250.93 of Rules and Regulations, preceding. A 30-inch water intake pipeline for the City of Sheboygan, Wis., was constructed in 1959 just northeast of the Sheboygan Water Filtration Plant about 1.25 miles north of Sheboygan Harbor. The pipeline extends east about 2,100 feet from the shore line and has 24.5 feet of water over the intake.

The coastline, for about 24 miles between Sheboygan and Manitowoc, Wis., is a moderate bluff. As far north as the coast just beyond Northeim, there are, generally speaking, no outlying obstructions of particular importance to large vessels giving the coast a proper berth. However, the lake bottom bordering the shore for a distance of about 1 mile, is rocky and decidedly uneven, with boulders and shallow lumps scattered irregularly about and having depths of 8 to 12 feet at the outer edge.

Sheboygan Reef is a detached shoal about ⅓ mile long north and south, with least depth of 4 feet over its center, which is ¾ mile northeasterly from Sheboygan Pierhead Light. It is marked by a buoy placed in 38 feet of water about 300 feet east of the reef and 3,370 feet northeasterly from Sheboygan Breakwater Light.

Chart 14903—Caution Area (Area E-6).—The Sheboygan Rifle and Pistol Club, Inc., Sheboygan, Wis., conducts firing daily on the lake front at a point 5.45 miles north of the entrance to Sheboygan Harbor. This firing creates a caution zone approximately 3,500 feet wide extending 3 miles lakeward from the shore line. Mariners are advised to consult the U.S. Coast Guard Notices to Mariners for schedules of firing and instructions.

Cleveland, Wis., (formerly **Hika**), is 11½ miles north of Sheboygan. In July 1978, only a natural ramp and a small pier with shallow water alongside were available for boats at Cleveland. About 2 miles 172° from the inner end of the remains of the old Hika pier and 3,500 feet from shore, a rock about 25 feet in diameter rises abruptly from a depth of 20 feet to within 2 feet of the water surface; it is a menace to launches and small craft able to navigate in the adjacent shallow water.

About 1¾ miles below Manitowoc piers, near **Silver Creek**, there is a large shoal with its outer limits 1 mile off shore, with depth of but 9 feet on its easterly point.

Charts 14903, 14922—Manitowoc Shoal is a shoal area of variable depths to the south of the entrance channel course into Manitowoc Harbor. It is marked on the northeasterly end with a buoy. Within the shoal area, an area with least depth of 15 feet over it, is located about 1 mile southeasterly from the Manitowoc Pierhead Light.

A shoal of rock formation and of irregular outline, about 1,000 feet across east and west and 500 feet north and south on the 21-foot contour, lies about a half-mile southeasterly from Manitowoc Shoal and 1⅜ miles from shore; this shoal has a least depth of 14 feet on its extreme easterly edge, at a point 6,200 feet southeasterly from the north breakwater light.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A water intake pipeline of the city of Manitowoc commences on the shore 2½ miles 191½° from Manitowoc North Breakwater Light and extends 900 feet 100° into about 7 feet of water. The pipeline terminates in an intake structure extending 6 feet above the water surface. The structure is not lighted.

Water Intakes.—Three unmarked city of Manitowoc cooling water intake cribs are located about 3,800 feet south of the south breakwater, 500, 1,500 & 2,000 feet off shore, respectively, in a southeasterly direction from the waterworks.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A 48-inch water intake pipeline of the city of Manitowoc commences on the shore 4,230 feet 221° from the Manitowoc South Breakwater Light and extends 8,715 feet 106½° to an intake crib in 33.8 feet of water. There is 29 feet of water over the crib and it is not marked.

Pipelines.—A 24-inch diameter steel intake pipeline of the Anheuser-Busch Inc., commences at a well intake at the shoreline approximately 2,950 feet 229° from the Manitowoc South Breakwater Light and extends 3,675 feet 128° to an intake crib in about 30 feet of water. There is about 26 feet of water over the intake and it is not marked.

An abandoned 12 inch intake pipeline extends 2,550

feet 124° from a point on shore to a crib with 24 feet of water over it. This unmarked crib is 2,960 feet 174° from the Manitowoc South Breakwater Light.

A sewer outfall pipeline extends 775 feet 071° from a point on shore to about 11 feet of water. This unmarked outer end is 1,190 feet 225° from the Manitowoc South Breakwater Light.

Manitowoc Harbor, Wis.—This harbor is located at the mouth of **Manitowoc River**, about 79 miles north of Milwaukee Harbor. The most prominent feature at Manitowoc is the lighted elevator 0.6 mile southwest of Manitowoc Breakwater Light. The lighted stack 0.5 mile south of the elevator has horizontal red and white bands.

Channels.—A dredged entrance channel leads from deep water in Lake Michigan between converging breakwaters through an outer harbor basin to the mouth of the Manitowoc River, and thence upstream for about 1.6 miles to the second Soo Line Railroad bridge. In July 1978, the controlling depths were 20 feet through the entrance and outer basin except for shoaling in the northwest corner of the basin, thence 19 feet at midchannel in the river channel to the limit of the project.

The outer basin is not adapted for anchorage, but reduces wave action in the lower section of the river. Mooring to the breakwaters is prohibited. Mariners are cautioned against navigating outside the channel limits in the vicinity of structures protected by stone riprap.

The currents in the river attain velocities up to 3 m.p.h.

Confined Disposal Area.—A diked disposal area is located adjacent to and north of the north breakwater. The area extends northward from the breakwater for about 1,800 feet with the westerly limits about 1,000 feet from shore along the breakwater, and the easterly limits about 1,700 feet from shore along the breakwater.

The banks of the river channel from about Tenth Street Bridge to the lower end of the Medusa Portland Cement Co.'s dock consist generally of hardpan and firm clay containing, in places, a considerable proportion of stones. Vessels should navigate this section of the channel with care. The channel at the bend just below the Medusa Portland Cement Co.'s dock has been widened about 50 feet on the north side of the river to provide more freedom of movement for vessels making this turn. Above the second Soo Line Railroad bridge, the controlling depths are about 6 feet on the north side and 10 feet on the south side to the Chicago & North Western Railway bridge, with a 5-foot centerline shoal extending downstream from the center pier of the upper bridge, thence about 4 feet to Twenty-first Street Bridge, and thence about 8 feet to the third Soo Line Railroad bridge.

Aids to Navigation.—Manitowoc Breakwater Light is on the outer end of the north breakwater; an air fog diaphragm horn and a marker radiobeacon are operated at this station. Manitowoc Pierhead Light is on the end of the north stub pier. South Breakwater Light is located on the outer end of the south breakwater.

Harbor Facilities.—Limited dockage is available along a city dock on the north side of the river between Seventh and Eighth Streets. Gasoline, a launching ramp, and a pump-out station are available near the inner end of the north stub pier. Large vessels do not normally bunker or take on supplies at Manitowoc. Emergency above-waterline repairs are available.

Submarine Mooring.—Four pile clusters, for the mooring of the submarine **Cobia**, are located 150 feet to 430 feet west of the 8th Street bridge on the south side of the river 5 feet off the dock.

The submarine **Cobia** has a beam of 27 feet and is 309 feet long.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Manitowoc, Wis. is contained in the Port Series No. 48 (Revised 1973) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding, and 33 CFR § 117.650 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

Local Harbor Regulations are under the control of the Harbor Commission and are enforced by the **harbormaster** who can be reached through the Board of Harbor Commissioners, City Hall, 817 Franklin Street, Manitowoc, Wis. 54220. Copies of the regulations can be obtained from the board of harbor commissioners. A **speed limit** of 4 m.p.h. is enforced within the harbor limits.

Chart 14903.—The area between Manitowoc and Two Rivers, Wis., about 5½ miles northeast, is clear to within ¼ mile of the shore with the exception of a few outlying net stakes, and also of a shallow area lying from ¾ to 1½ miles northeasterly from the Manitowoc Pierhead Light and from ½ to ¾ mile from shore; in this area a rock with 8 feet depth bears northeast 6,000 feet from Manitowoc North Breakwater Light.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 CFR § 1250.93 of Rules and Regulations, preceding. A pipeline of the City of Two Rivers extends from a point on shore 5,120 feet 146° to an intake crib with 29 feet of water over it. The crib is 4,280 feet 164° from the Two Rivers South Pierhead Light; it is not marked.

Two Rivers Harbor, Wis.—This harbor is located at the mouth of the **Twin Rivers**, about 5¾ miles northeast of Manitowoc and 82 miles north of Milwaukee.

Several features are prominent at Two Rivers: two white tanks with black tops are 3,050 feet northwest of South Pierhead Lights, a stack 650 feet northeast of the tanks, a spire 1,030 feet northeast of the stack, and a lighted silver tank with "Twin Rivers" in black letters is 0.9 mile north-northeast of North Pierhead Light.

Channels.—A dredged entrance channel leads northwest from deep water in Lake Michigan between parallel piers to a harbor basin at the confluence of East and West Twin Rivers and thence upstream in **East Twin River** for about 0.5 mile to the 22nd Street bridge. In July 1978, the controlling depths were 10 feet in the approach channel, thence 10 feet between the piers, thence 18 feet in the basin except for shoaling to 14 feet in the south part and 16 feet at the northeast end, thence in East Twin River

Bridges, Etc., Across Manitowoc River at Manitowoc

No.	Location and name	Kind	Miles above mouth of river	Draw openings—clear width			Clear height, in feet, above water datum		Remarks
				Right*	Left*	Center	Low	High	
				Feet	*Feet*	*Feet*	*Feet*	*Feet*	
1	Eighth Street bridge	Highway	0.33	------	------	97	12.8	------	See Note 1.
2	Tenth Street bridge	do	.47	------	------	89.3	15	------	See Note 2.
3	Soo Line RR (Minn., St. P. & S. Ste. M.) (first crossing).	Railway	.99	------	------	93.3	6.7	------	See Note 3.
4	Soo Line RR (Minn., St. P. & S. Ste. M.) (second crossing).	do	1.76	61	61	------	6	------	Not lighted; seldom opened. Hand operated.
5	Chicago & North Western Ry	do	1.9	60.8	60.8	------	11.1	------	Do.
6	Aerial cable	Electric	1.91	------	------	------	80.0	80.0	Wis. Public Service Corp.
7	Do	do	2.01	------	------	------	66.0	------	
8	Do	do	2.11	------	------	------	84.0	80.0	
9	Twenty-first Street bridge	Highway	2.12	------	------	------	16.2	------	Fixed. Not lighted; channel not dredged.
9A	Aerial Cable	----------	2.16	------	------	------	------	------	
9B	Do	----------	2.17	------	------	------	------	------	
10	Soo Line RR (Minn., St. P. & S. Ste M.) (third crossing).	Railway	2.37	45	45	------	11.6	------	Fixed bridge; not lighted; head of navigation.

*Looking downstream toward the lake.

NOTE 1.—Double-leaf bascule. Red light on each protection pile cluster; 1 light on each side of free end of each leaf shows red when bridge is closed and green when open.

Signal for opening draw: 3 blasts (— — —).

NOTE 2.—Double-leaf bascule. Red light on each end of piers; 1 light on each side of free end of each leaf shows red when bridge is closed and green when open.

Signal for opening draw: 2 short, 1 long (— — —).

NOTE 3.—Single-leaf bascule. Red light on each end of rolling pier and lift pier; 1 light on each side of the leaf at free end shows red when bridge is closed and green when open.

Signal for opening draw: 2 short, 1 long (— — —).

Bridge tender service removed on Saturday and Sunday and from 8:00 p.m. to 4:00 a.m. on weekdays for the period from about 15 December to 15 March annually. Bridge will be opened on two hour advance notice by telephone: between 6:30 a.m. & 3:30 p.m. phone telegraph operator 648-6861. At all other times call the section foreman, Soo Line, phone (414) 722-4228.

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depths of 10 feet at the basin decreasing to 3 feet at 22nd Street. The entrance channel is subject to shoaling, especially during the winter and after severe storms.

A small basin at the shoreward end of the east pier is not used by vessels, but reduces wave action in the inner harbor. The inner basin is not adapted for anchorage, and mooring to the piers and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Currents in the river attain velocities up to 3 m.p.h.

Connecting with the inner ends of the harbor basin, West Twin River has a depth of about 9 feet on the southerly side of the channel to Washington Street Bridge. The nominal head of navigation on the East and West Twin Rivers is 3 and 7 miles, respectively, from the mouth, the navigable depth being not over 4 feet. Only small recreational craft operate on these rivers above the dredged channels.

Aids to Navigation.—Two Rivers North Pierhead Light is located on the outer end of the north pier; an air fog diaphragm horn sounds as required. South Pierhead Light is located on the outer end of the south pier.

Coast Guard Station.—Two Rivers Coast Guard Station is located on the northeast side of the entrance to harbor

National Weather Service Warning Display Station.—Storm warning signals are displayed about 2,300 feet west of the south pierhead light.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

City Bridge Regulations and Signals

Section 11.14(1)(a). Notice to Open Bridges Required

The operator of any boat desiring to pass through any bridge in the city of Two Rivers shall notify the city of his intention to pass through such bridge, and the city employees shall be allowed a reasonable time thereafter to open such bridge.

(b) Bridges on West Twin River. To avoid traffic congestion, the bridges on the West Twin River shall not be opened between 6:30 a.m. and 7:00 a.m., 7:30 a.m. and 8:00 a.m., 11:55 a.m. and 1:00 p.m., 3:30 p.m. and 4:15 p.m. and 4:45 and 5:15 p.m. on any day except Saturday, Sunday, and holidays when they may be opened at anytime.

[Adopted 5 Sept 1972]

Request to open bridges should be given to the Two Rivers Police Department, telephone 414-793-1155, via land telephone or marine operator.

Between Two Rivers Harbor and Rawley Point Light, a distance of about 5½ miles, the shore is shoal within ¾ mile, with some scattered outlying stakes.

Rawley Point is wooded, broad, and rounding. **Rawley Point Light** (formerly **Twin River Point Light**), 113 feet above the water and shown from a white cylindrical tower, is a prominent aid to vessels transiting the area. A radiobeacon is operated at the light (see Light List for details).

Section X.—West Shore of Lake Michigan From Rawley Point to and Through the Sturgeon Bay Canal

Regional Charts: Chart 14902; Coast Chart 14903: Coast Chart 14910.

Chart 14903.—Between Rawley Point and Kewaunee, a distance of about 17 miles, the shore line recedes somewhat to the westward for about 8 miles, then easterly, and is lined with rocky shallows from ½ to 1 mile width. The waters around Rawley Point are obstructed by net stakes for a distance of about 1½ miles offshore.

Point Beach Nuclear Powerplant is 5 miles north-northwest of Rawley Point Light. The green square-shaped structure at the plant is prominent. A water intake pipe extends 1,750 feet east-northeast into the lake. The intake pipeline terminates in about 19 feet of water at a crib, 110 feet in diameter, extending 10½ feet above the lake surface. The crib is marked by two lights mounted on white poles, 8 feet above the crib.

Kewaunee Nuclear Powerplant is about 4½ miles north of the Point Beach plant. The cooling tower dome is prominent. A water intake pipeline extends 1,600 feet 072° into the lake. The intake pipeline terminates in about 15 feet of water at a crib which has about 13 feet of water over it. The crib is not marked.

Charts 14903, 14910.—Kewaunee South Shoal, in the approach to Kewaunee, is a hard gravel and boulder reef with a least depth of 13½ feet and depths of less than 21 feet over an irregular area extending from about ⅓ to 1½ miles from the harbor entrance; it is about 2,000 feet wide at the outer end.

Kewaunee Shoal Light marks the northerly edge of the shoal near the outer end; an electric fog siren sounds as required. The base of this light structure is surrounded by protective rip-rap extending horizontally out from the structure about 50 feet. It should not be passed close aboard, even by vessels of shallow draft.

Kewaunee Harbor, Wis.—This harbor is located at the mouth of the **Kewaunee River,** about 105 miles north of Milwaukee and about 26 miles southerly from Sturgeon Bay Canal.

Channels.—A dredged entrance channel leads from deep water in Lake Michigan northwestward to an outer harbor basin protected by a breakwater on the northeast side and a pier on the south side. From the outer basin, the channel leads between piers at the mouth of Kewaunee River to a turning basin inside the mouth, thence northward inside the shoreline to the north harbor basin.

In July 1978, the controlling depths were 20 feet in the approach channel, thence 12 feet through the south part of the outer basin, thence 17 feet through the piers and in the east half of the turning basin with depths decreasing to 3 feet in the west half, thence 15 feet in the channel to the north basin with 19 feet in the basin.

The outer basin is not adapted for anchorage, but reduces wave action in the inner harbor. Mooring to the breakwater or piers is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Currents in the river attain velocities up to 3 m.p.h.

Connecting with the northwesterly corner of the turning basin, the Kewaunee River is navigable for a distance of about 6½ miles above its mouth for craft drawing not more than 4 feet. There is no regular commerce on this part of the river but gasoline is available at dockside pumps.

Aids to Navigation.—Kewaunee Breakwater Light is on the outer end of the north breakwater. Kewaunee Pierhead Light is on the outer end of the south pier; a foghorn and a radiobeacon are operated at this station. Kewaunee North Pierhead Light is on the outer end of the north pier.

Car Ferry.—The Ann Arbor Railroad Company operates an automobile and railroad car ferry between Kewaunee and Frankfort, Mich. The Kewaunee terminal is on the east bank of the north branch of the inner harbor, 1,250 feet northwest of North Pierhead Light. Scheduling information may be obtained from the local agent.

There is occasional barge traffic on the river from the Kewaunee Engineering Corp., on the north bank of the inner harbor about 1,100 feet north of the car ferry slip.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

Local Harbor Regulations.—Local harbor regulations have been established by the City of Kewaunee and are

enforced by a harbormaster, usually found at the city launch ramps, and police department. A speed limit of 5 m.p.h. is enforced in the harbor. Copies of regulations can be had from the City Clerk, 413 Milwaukee Street, Kewaunee, Wis. 54216.

From Kewaunee to Algoma, Wis., about 11 miles distant, the shore is low and tends northeasterly with the shallow water lying within ¾ mile of the coast. There are boulders with 11 or 12 feet depths in the shoal water just north of the entrance between the piers at Kewaunee.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 CFR § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline of the city of Green Bay, Wis., extends from the shore 5,900 feet 090° to an intake crib with a least depth of 42 feet over it. The crib is 18,700 feet 026° from Kewaunee Pierhead Light and is not marked. Rocks 1 foot below the water surface lie about 1,000 feet from shore along the intake pipe.

A pipeline commences on the shoreline about 100 feet

Bridges Across East and West Twin Rivers at Two Rivers Harbor

No.	Location and name	Kind	Miles above mouth of river	Draw or span openings—clear width in feet proceeding upstream			Clear height above low-water datum	Remarks
				Right	Left	Center		
	East Twin River						*Feet*	
1	Seventeenth Street	Highway	0.3	------	------	70	14.5	Bascule.
2	Twenty-second Street	do	.65	------	------	70	9	Not lighted.
	West Twin River							
3	Washington Street	Highway	.34	------	------	55	14.2	See Note.
4	Chicago & North Western Ry	Railway	.45	50	50	------	12	Not lighted.
5	Sixteenth & Madison Street	Highway	.63	------	------	70	14	Bascule.

NOTE.—Double-leaf bascule. Red light on each end of piers; one light on each side of free end of each leaf shows red when bridge is closed and green when open.

Bridges, Etc., Across Kewaunee River at Kewaunee

No.	Location and name	Kind	Miles above mouth of river	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above low-water datum		Remarks
				Right	Left	Center	Low	High	
1	Aerial cable	Electric	0.27	------	------	------	46.7	42.7	Wisc. Public Service Corp.
2	Park St bridge	Highway	0.28	------	------	90.3	9.1	------	Single-leaf bascule. Not lighted.
2A	Submerged Pipeline	------	0.29	------	------	------	------	------	
2B	Submerged Cable	------	0.30	------	------	------	------	------	
2C	do	------	0.32	------	------	------	------	------	
3	Aerial cable	Electric	0.53	------	------	------	30.0	------	
4	do	do	0.73	------	------	------	30.0	------	
5	Green Bay & Western RR. bridge.	Railway	1.5	30	30	------	5.7	------	Swing. Not lighted.

Structures Across Ahnapee River at Algoma

No.	Location and Name	Kind	Miles above Pierhead Light	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Second Street bridge	Highway	.38			102.0	12.0	8.0	Fixed bridge. Not lighted.
2	Submerged pipeline		.39						Approx. depth 9 feet.
3	Fourth Street bridge	Highway	.54			42.0	10.7	6.7	Fixed bridge. Not lighted.
4	Aerial cable	Electric	.60				39.1	35.1	Peninsular Service Co.

south of the city of Green Bay pipeline and extends 3,000 feet 090° to an intake crib. There is a least depth of 28 feet over the intake crib and it is not marked.

Chart 14910.—Algoma Harbor, Wis., is located at the mouth of Ahnapee River, about 17 miles southerly from Sturgeon Bay Canal.

Channels.—A dredged entrance channel leads from deep water in Lake Michigan between a north pier and south breakwater to an outer harbor basin, thence through the mouth of Ahnapee River upstream for 0.2 mile to the Second Street bridge. In 1977, the controlling depths were 13 feet in the entrance channel, thence 7 feet across the northeast part of the outer basin and upstream to the Second Street bridge. The outer basin, southwestward of the channel, had depths of 7 feet decreasing to 4 feet at the southwest limit.

The river channel bottom is rock and should be navigated with caution. Above the dredged channel, depths of about 3 feet can be carried for about 2 miles. The bottom in this reach is also rock.

The outer basin is not adapted for anchorage, and mooring to the breakwater or piers is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Currents in the river attain velocities up to 3 m.p.h.

Aids to Navigation.—Algoma South Breakwater Light is at the outer end of the south breakwater, 250 feet 212° from Algoma Pierhead Light. Algoma Pierhead Light is at the end of the detached north pier; a fog diaphragm horn sounds as required. Inner Light is on the end of the main part of the north pier, 270 feet northwest of the pierhead light.

Harbor Facilities.—Marine fuel and a hoist for recreational craft are available in the harbor.

Navigation Regulations.—See 33 CFR § 162.120 of Rules and Regulations, preceding.

Local Harbor Regulations.—Harbor regulations have been established by the city of Algoma, and are enforced by a Water Safety Patrol. Copies of regulations may be obtained from the Chief of the Water Safety Patrol.

In the reach from Algoma to the Lake Michigan entrance into the Sturgeon Bay and Lake Michigan Ship Canal, a distance of about 14 miles, the coast is hilly and bordered by rocky shoals from ⅜ to ¾ mile wide. This character of the coast prevails for about 10 miles. The northerly 4-mile section then has generally a low shore line with shoals and outlying spots offshore a distance of from ⅝ to 1⅛ miles, with depths of 4 to 10 feet near the outer edge. A buoy is moored about 2¼ miles southerly of the Sturgeon Bay Pierhead Light to mark the northeastern edge of this shoal area.

Charts 14910, 14919—Sturgeon Bay and Lake Michigan Ship Canal, Wis.—This waterway is located on the west shore of the lake about 128 miles north of Milwaukee Harbor and about 40 miles south of Porte des Morts. It affords a navigable connection between Lake Michigan and the southerly portion of Green Bay by means of dredged channels and a canal across the narrow land divide between the lake and the head of Sturgeon Bay, opening from Green Bay.

Channels.—The dredged channel from Lake Michigan to Green Bay is about 8.6 miles long. The channel leads northwesterly from deep water in the lake through converging breakwaters and a revetted canal to the southeast end of Sturgeon Bay and thence through Sturgeon Bay to the vicinity of Sherwood Point. A turning basin is on the southwest side of the channel at the city of Sturgeon Bay.

In 1976, the controlling depths were 23 feet in the approach channel in Lake Michigan, thence 20 feet between the breakwaters, thence 22 feet through the revetted canal, thence in 1976–1977, 20 feet through Sturgeon Bay with 20 feet in the turning basin.

Currents in the canal and bay attain velocities up to 7 m.p.h. in either direction.

Mariners are cautioned against navigating outside

channel limits in the vicinity of structures protected by stone riprap.

The channels and basin are not adapted for anchorage of vessels; vessels entering the canal for shelter may moor at the westerly end of same.

Sturgeon Bay, into which the canal leads, is a natural bay leading from Green Bay, but the aids are placed with respect to the waterway from the Lake Michigan entrance through to Green Bay.

Shoals in Lake Michigan Approach.—A shoal area lying a little easterly of a point about 500 feet to the south of the outer end of the south pier is of solid rock formation. The depth on the north edge of this shoal is about 10 feet, with only 11 feet nearby to southward. While the shoal lies to the southward of the entrance and would not be encountered on the proper channel course, vessels occasionally enter in a direction which would carry them very close to this shoal; the attention of all masters is therefore directed to the presence of this menace. In approaching the canal, vessels should pass between a red nun and a black can located about 1,200 feet off the ends of the breakwater.

A shoal with 16 feet least depth of water, is located about 6,000 feet beyond the pierhead light and about 800 feet northeast of the prolongation of the axis of the canal. The shoal is marked on the southerly side by a lighted buoy located 6,800 feet 133½° from the north pierhead light.

Aids to Navigation.—Sturgeon Bay Canal North Pierhead Light is on the outer end of the detached portion of the north pier; an air fog diaphone and a radiobeacon are operated near this light. Sturgeon Bay Canal South Pierhead Light is located on the outer end of the detached portion of the south pier. Sturgeon Bay Canal Light is situated on the northerly side of the entrance to the canal from the outer basin. Sturgeon Bay Canal Light No. 6 is on the northeasterly side of the entrance to the canal from the outer basin; a rectangular beacon on the opposite side of this entrance is floodlighted from Light No. 6. Sturgeon Bay Canal Light No. 7 is on the southwesterly side of the entrance to the canal from the cut in Sturgeon Bay and 6,200 feet northwesterly Light No. 6. Sturgeon Bay Canal Light No. 12 is on the northerly side and at the elbow of the channel at the entrance to the cut in Sturgeon Bay leading to the canal. Sturgeon Bay Canal range front light is 28 feet above the water and the rear light, 47 feet above water, is 1,600 feet 120° from the front light. Sturgeon Bay Canal Leading Light is 25 feet above the water on the highway bridge. East bank buoy No. 18 is on the northeasterly side and at the turn easterly of the highway bridge. The dredged channel from the canal northwesterly to the highway bridge is marked by buoys on the northeasterly and southwesterly edges. The turning basin is marked by a buoy at its northerly junction with the dredged channel.

Coast Guard Station.—Sturgeon Bay Canal Coast Guard Station is located on the north side of the eastern entrance to the canal.

A Coast Guard Marine Inspection Detachment is at 360 Louisiana Street, Sturgeon Bay, Wis. 54235, phone (414) 743-9448.

National Weather Service Warning Display Station.—Steel tower.—At the Coast Guard Station, displayed on yardarm, north side at the entrance to the Sturgeon Bay Canal.

Sturgeon Bay Harbor, Wis.—The city of Sturgeon Bay, situated midway between Lake Michigan and Green Bay on the waterway, has boat works and shipyards where repair facilities are available, including dry docks, marine railways, and boat hoists. All types of services are available at this port including municipal docks available for moorings and commodity handling, mooring basins, diesel fuel, and gasoline which may be obtained at dockside pumps.

Dry Docks.—A dry dock of the Bay Shipbuilding Corp., located on the northeast side of Sturgeon Bay about 3,000 feet northwesterly from the bridges maintains a floating dry dock 604 feet long, 70 feet wide at bottom and 88 feet wide over-all with 15.0 feet depth over keel blocks, capable of taking vessels up to 650 feet long, 66 feet wide, and 7,000 tons. The dock is sectional and can be split up to any combination of 60-foot lengths.

Two graving docks are available. The larger is 1,150 feet long, 140 feet wide with 19 feet over the sill.

A floating drydock of Peterson Builders, Inc. is 320 feet long, 52 feet wide, has a depth of 16.5 feet and is capable of taking vessels up to 275 feet long, 40 feet wide, and 2,000 tons.

Anchorage Regulations.—See 33 U.S.C. 47 published in Certain Laws, preceding, and 33 C.F.R. § 110.78 of Rules and Regulations, preceding.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding, and 33 CFR § 117.645 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.125 of Rules and Regulations, preceding.

Dunlap Reef is marked at its north end by a light 225 feet southwesterly from the middle of the dredged channel and at the northeasterly end of the 6-foot contour of the middle ground which extends about ¾ mile northwesterly from the Michigan St. bridge at the city of Sturgeon Bay. The middle ground is also marked by a buoy on the easterly side about one-quarter of the way from the northwest end light to the bridge. There is deep water to the west of the middle ground, but only 11 feet is available around the southerly end and approaching the land spit, which is the site of the former railroad bridge, and the turn is too sharp for vessels bound for the canal.

About 6,000 feet northwest of the Michigan St. bridge, a red nun on the easterly edge and a black can on the westerly edge of the channel mark the changeover from the channel width of 250 feet to a width of 500 feet.

Hills Point is marked by a light about 30 feet from the water's edge, to westward of the dredged channel. A buoy marks the westerly edge of the channel at a point about 2,000 feet southeasterly from the light, and another buoy marks a 17 foot shoal on the westerly side of the channel 3,000 feet northwesterly of the light. Shoal

Bridges, etc. Across Sturgeon Bay at Sturgeon Bay

No.	Location and name	Kind	Miles from Lake Michigan entrance to canal	Draw openings—clear width			Clear height above low-water datum	Remarks
				Right*	Left*	Center		
				Feet	*Feet*	*Feet*	*Feet*	
1	Aerial cable		1. 25				140. 0	
2	Bayview bridge	Highway	3. 0			160	50. 0	Double-leaf bascule.**
3	Submerged pipeline	Water	4. 2					City of Sturgeon Bay Approx. depth 30 feet.
4	Submarine cables (3 cables)	Electric	4. 38					Wis. Pub. Ser. Corp. Approx. depth 33 feet.
5	Submerged 8″ pipeline	Natural gas.	4. 4					Wis. Pub. Ser. Corp. Approx. depth 33.0 ft.
6	Submarine cables	Power	4. 42					Wis. Tel. Co. Approx. depth unknown.
7	Submerged 8″ pipeline	Natural gas.	4. 46					Wis. Pub. Ser. Corp. Approx. depth 33.0 ft.
8	Michigan Street bridge	Highway	4. 5			139. 4	14. 7	Double-leaf bascule. See Note 1.**

*Looking westward toward Green Bay.

NOTE 1.—Red light on each protection pile cluster and in center of each fender; 1 light on each side of free end of each leaf shows red when bridge is closed and green when open.

**Signal for Opening Draw: One long blast, one short blast (—— —).

ground making out from the easterly shore of the bay extends across toward the western shore in the vicinity of Quarry Point and Hills Point. The dredged channel through this shoal, southeasterly from Hills Point, is marked on its easterly edge opposite Hills Point by a buoy, and about 2,000 feet farther southeasterly by another buoy on the easterly edge.

Sturgeon Bay Directional Light showing occulting light sectors, green from 171° to 179°, white from 179° to 182° and red from 182° to 190°, is located on the centerline of the channel extended on shore between Hills Point and Quarry Point.

Opening west from Sturgeon Bay and just south of Sherwood Point is a small shallow inlet called Sawyer Harbor. Opposite Sawyer Harbor and to the northeast of Quarry Point, the entrance to the vessel channel is marked by a buoy on its westerly side, and on its easterly side by a lighted buoy due north from Sturgeon Bay Directional Light.

Sherwood Point Light, marking the northwest point of the entrance into Sturgeon Bay from Green Bay, is shown from the outer end of Sherwood Point; an air diaphragm foghorn and a radiobeacon are operated at this station. Sherwood Point Shoal, marked at its northerly end by a lighted buoy lies 1.9 miles 314° from Sherwood Point Lighthouse. It is of boulder formation, about 700 feet in diameter on the 21-foot contour, and has a minimum depth of 11½ feet. Being detached and surrounded by deep water, it forms a menace to vessels navigating in this vicinity.

Section XI.—West Shore of Lake Michigan From Sturgeon Bay Canal to Porte Des Morts Passage

Regional Charts: Chart 14902, Chart 14900; Coast Charts 14910 and 14909.

Chart 14910.—The shore line of Lake Michigan extends in a northeast direction generally from the Lake Michigan entrance to the Sturgeon Bay and Lake Michigan Ship Canal, to the northernmost point of the Door County, Wisconsin, peninsula. This stretch is composed

of a series of definite bays and points and the offshore areas are interspersed with submerged net stakes. The first point of prominence is **Whitefish Point** about 7¾ miles; ⅝ mile to the southeast off the Whitefish Point is a reef with 10 feet depth, marked on its outer edge by a buoy.

Whitefish Bay is a bight about 4 miles across between Whitefish Point and **Cave Point.** Between the Canal and Cave Point, the shoal border is from ¼ to ⅞ mile in width, the maximum extent being at a point about 3 miles above the Canal. An outlying small shoal of bed rock, with least depth of 16 feet, lies in 60 feet of water 1⅘ miles 175° from Cave Point.

Jacksonport, Wis., is about 3 miles north of Cave Point. There is a launching ramp at the State park, but no commercial traffic and very few recreational boats enter the port.

A buoy marks the lakeward edge of the offshore shoals, about 1¾ miles southeasterly from the old piers and about 2½ miles northeasterly from Cave Point.

Coast Chart 14909.—Baileys Harbor, about 5 miles north of Jacksonport, is sheltered and affords good anchorage, but is subject to considerable surge during heavy seas. Shoals make out 1 mile southerly from the point on the east side of this harbor, the southwest corner of this area being marked by a buoy. An abandoned lighthouse tower stands on an island abreast of the southerly end of the east entrance point. Shoal water borders the east shore for ¼ mile and the north and west shores for ½ mile. Middle Ground Shoal lies in the southwesterly entrance of the harbor, and is ⅞ mile long north and south with depths of 1 to 5 feet. A buoy is moored to the eastward of the Middle Ground Shoal, about 3 miles south-southeast of Baileys Harbor Directional Light in the white sector. A submerged obstruction, which appears to be an old anchor, is about 1 mile, 155° from the light.

Baileys Harbor Directional Light (formerly range lights) is at the head of the bay ½ mile northeast of the village. The Directional Light sectors show green from 340½° to 342½°; white from 339° to 340½° and red from 337° to 339° with the recommended vessel course in the white sector leading between the Middle Ground Shoal and that making off the east entrance point; vessels should keep 1½ miles from land as long as the white sector is not visible. Do not anchor nearer the northern shore than ½ mile, as the water is shallow and the sea that sets in during southerly gales is only partially broken by the shoals outside. The best holding ground is on the east side.

From the point south of Baileys Harbor, a shallow spit runs out to the southeast about ⅝ mile, and about 1⅜ miles southeasterly from the point is a shoal area extending about 1 mile north and south and 1,000 feet east and west on the 21-foot contour, on which there are a number of spots having depths of 13 to 17 feet.

Northeastward of Baileys Harbor, **Moonlight Bay** opens, and has a limited area of deep water close to its entrance, which affords fairly good anchorage and protection except from east to south winds. The most easterly point of land between Moonlight Bay and North Bay is **Cana Island,** which is connected by a narrow neck with the shore. Cana Island Light is shown from the most easterly side. North of Cana Island the coast is clear and bold to North Bay except for some submerged net stakes about ⅝ mile offshore in more than 40 feet of water.

North Bay, an indentation to the south of Rowley Bay, has only a small area of deep water close to its mouth, which affords fair anchorage and protection to small vessels from all but east winds. Entrance to the anchorage area is constricted by shoals extending from the two entrance points and marked at their extremities by buoys. The width between the two buoys is about ⅜ mile, but pound nets extend beyond the buoys into deep water, with clear width between them of ⅛ mile. Vessels should proceed with care in entering to avoid abandoned net stakes. The anchorage ground reaches only ¾ mile from the entrance buoys.

Sand Bay is a small indentation on the westerly side of Rowley Bay about 1 mile southerly from its head. Commercial fishermen operate from private slips along the bay. These slips, two on the west side near the south and one near the north end of the bay, with short breakwalls, provide shelter from all winds. A depth of 6 feet is available in each slip.

Rowley Bay, Wis.—Shoals extend southerly 1 mile from the point west of Spider Island, and extend ¾ mile off the east and north shores of Rowley Bay, lying west of this point. The bay affords but little shelter and the anchorage is not good; its north end is fouled by many rocky spots with from 2 to 14 feet of water on them. The easterly approach to Rowley Bay is obstructed by **Four Foot Shoal** extending in a north and south direction for 2¾ miles, and lying 1⅜ miles off the adjacent shore to the west; near its southeastern point, which is marked by Four Foot shoal buoy, is an exposed gravel bank and numerous rocks awash, north of which the limiting depths on the shoal range from 2 to 6 feet. A detached 2-foot reef is located about ⅝ mile north of the shoal, and a 9-foot spot disconnected from the offshore bank lies ¾ mile from the shore abreast of the middle of the shoal. The east entrance to Rowley Bay, which lies north of the large shoal, is marked on the northerly side by two buoys and on the southerly side by a buoy. The south entrance channel is marked by a buoy on the westerly side of the large shoal.

Along the main shore for about 6 miles from Rowley Bay to the Porte des Morts Passage, the waters are rendered foul by an irregular bottom formation of very shallow banks and detached spots, which attain a maximum reach of about 2½ miles from the shore between **Gravel Island** and heavily wooded **Spider Island. Outer Shoal,** the most easterly extent of this foul area, is marked by a buoy 2½ miles northeast of Spider Island. There is only 4 feet of water on a detached shoal within a half mile to westward inside the buoy. A boulder shoal about 100 feet in diameter on the 21-foot contour, with minimum depth of 16 feet, lies 4¾ miles southerly from Pilot Island Light. A lighted bell buoy is stationed in deep water on the alignment of the Plum Island Range Lights, at a point about 3¾ miles southerly from Pilot Island Light, and marks the junction of the charted vessel

courses in the southern approach to Porte des Morts Passage, abreast of Outer Shoal. A detached reef with 9½ feet least depth lies with its northerly end ⅝ mile southeasterly from the southerly end of Spider Island, and extends thence southwesterly ½ mile.

The whole north shore of the peninsula is deep-to around the Porte des Morts Passage and into Green Bay.

Section XII.—Green Bay Entrance Passages and Islands, Porte des Morts, Wis., to Point Detour, Mich.

Regional Charts: Chart 14900; Chart 14902; Coast Charts 14909 and 14908.

Green Bay has a length northeasterly and southwesterly of about 118 miles from the head of Big Bay de Noc to the mouth of Fox River, and greatest breadth northwesterly and southeasterly of 23 miles, abreast of Rock Island Passage. It is partly separated from Lake Michigan on the east by two peninsulas, the one to the north being about 20 miles long and that on the south about 70 miles long.

The outlet of Green Bay between the two mainland peninsulas is approximately 28 miles wide, but the waterway is so choked with islands and submerged reefs and shoals that the channels through them have acquired the reputation of being dangerous. The four principal entrances are the Porte des Morts Passage at the southerly approach, commonly known as "Death's Door", the Rock Island (or main) Passage to the north of Washington Island, the St. Martin Island Passage at the northerly approach, and the Poverty Island Passage. Through the Rock Island Passage, the channel is 2 miles wide between the 60-foot contours.

Chart 14909.—Porte des Morts Passage, Wis., is the southerly entrance to Green Bay in this area, having Plum and Pilot Islands on its northeasterly side and the south mainland peninsula opposite. It is known as "Death's Door", owing to the numerous detached reefs and shoals obstructing its navigation and the strong currents setting in or out according to the direction of the wind. The coast is rockbound and is almost certain destruction to craft going aground. These conditions have been the cause of many vessel disasters.

Plum Island and Pilot Island Lights.—On the southwesterly side of **Plum Island** are the Plum Island range lights, forming a guide for entering Portes des Morts Passage. A marker radiobeacon is at the rear light. **Pilot Island** is located 1⅛ miles southwesterly from the south end of Detroit Island, on the north edge of a shoal of about ¼ mile diameter, on the northeasterly side of Portes des Morts Passage. Pilot Island Light shows 48 feet above water on a square tower.

Waverly and **Nine-Foot Shoals** are situated, respectively at the northeast and southeast (or outer) corners of a shallow rock bank extending about 1⅛ miles eastward from the mainland on the southerly side of Porte des Morts Passage. Waverly Shoal, with 12½ feet least depth, is marked on its northeast side by a buoy, located about 1¼ miles westerly from Pilot Island Light. Nine-Foot Shoal, with 4 feet depth of water, is about ⅜ mile southerly from Waverly Shoal and is marked by a buoy at its easterly extremity.

Plum Island, Wis., lying about midway between Washington Island and the south mainland peninsula, is about 1 mile long northwest and southeast by about ⅝ mile wide. Shoal water borders its west, south, and east sides for ⅛ to ¼ mile, and a small detached 16-foot boulder shoal lies ⅝ mile east of the southeast point of the island and 1⅜ miles northwesterly from Pilot Island Lighthouse. A shoal bank extends out from the north shore, and is marked on its east side at a point ⅝ mile north of the island by a lighted buoy; this buoy can be passed close-to on the east, but a narrow ridge with depths of 15 to 20 feet continues northerly from it a distance of 2,300 feet. The anchorage between Detroit and Plum Islands is safe and frequently used during easterly gales, but it is subject to considerable swell.

Coast Guard Station.—The Plum Island Coast Guard Station, seasonally operated, is on the northerly side of Plum Island.

Detroit Island, Wis., extending in a southeasterly direction from the mouth of Detroit Harbor, is about 3½ miles long and about 3,000 feet across at its widest point. The bank which connects its northeasterly end with Washington Island diminishes proceeding along the east shore toward the south point, from which a rocky shoal reaches ½ mile to the southeast. Off the west side of the island, reefs with 8 to 10 feet depth and having deeper water inside them, parallel the shore at a distance of ⅞ mile out. These shoals, particularly **Middle Shoal**, marked by a buoy, form obstructions in the Detroit Island Passage between Detroit and Plum Islands. Vessels should not attempt to pass northeastward of the buoy unless familar with the locality; there is a good channel between it and Plum Island and passing to the east of Plum Island lighted buoy.

Washington Island, Wis., is the largest island in the Green Bay outlet, being about 6 miles in greatest length north and south by about 5½ miles greatest width east and west; its area is about 24 square miles, much of which is timbered. The north and west shores of the island are bluff, with deep water close-to. Boyer Bluff Light is on the northwest point of the island and is shown 215 feet above the water from a white skeleton tower. The east shore of the island is bordered by a shoal stretch generally about ⅝ mile wide, but which, at about the middle of the island, extends offshore 1¼ miles, with depths of 9 to 12 feet at the outer edge; on this latter shoal is situated **Hog Island.** A small reef with 9 feet of water on it lies ⅝ mile southeast of the southeast point of Washington Island.

The shore line of Washington Island is irregular and forms four prominent bays or natural shelters which are known as Detroit Harbor, West Harbor, Washington Harbor and Jackson Harbor.

Detroit Harbor, Wis., is a large but shallow indentation in the west part of the south shore of Washington Island. In the mouth of the harbor is situated the northerly end of

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Detroit Island, in the form of a horseshoe which incloses a naturally protected area. A bank with prevailing depths of 1 to 3 feet extends from the northeasterly side of Detroit Island to Washington Island, the southeasterly entrance to Detroit Harbor for small craft being across this bank. The main entrance to the harbor is to the west of Detroit Island and is about 900 feet wide between the adjacent shore lines of Detroit and Washington Islands. North of Detroit Island there are general depths of from 7 to 10 feet over an area roughly 1 mile in diameter which is about half of the total harbor area. A rocky spot with but 3 feet depth is located near the center of this area.

Channels.—A dredged entrance channel leads northward from deep water in Green Bay between Detroit and Washington Islands for 0.7 mile to a turning basin in the southwest corner of Detroit Harbor. In 1976, the controlling depth was 13 feet in the channel and basin.

Aids to Navigation.—Detroit Harbor Entrance Light is located 2,600 feet 180° from Washington Island Ferry Line dock. A foghorn is located on the light tower. A buoy marks the east side of the turn of the dredged channel. There is a stone reef on the easterly side of the channel about opposite the ferry dock. The turning basin is marked by three buoys on the east side and a fourth buoy on the northwest corner.

Harbor Facilities.—A ferry service is operated from Gills Rock, Wisconsin, to Detroit Harbor, Washington Island, and to the Rock Island State Park on Rock Island. On the easterly shore of Detroit Harbor is a boat works and marine railway having a 100 ton capacity to accommodate ships up to 65 feet in length and up to 7 feet draft.

West Harbor, Wis. is a small shallow indentation in the west shore of Washington Island, near the southwest corner. Its shoal water and exposure to westerly and northwesterly winds make it practically of no value for commercial purposes.

Washington Harbor, Wis. is a deep indentation in the north shore near the northwest corner of Washington Island. The harbor has good water with bold shores and, although the bottom is ledge rock and poor holding ground for anchors, good protection is afforded from all winds except those from northerly directions.

Jackson Harbor, Wis. is a small shallow indentation in the northeast corner of Washington Island. Immediately inside of the entrance there is a small area about 250 feet by 200 feet in size and from 10 to 12 feet deep. A considerable part of the remainder of the harbor is from 3 to 6 feet deep. Ferry service is available to the State Park on Rock Island.

Channels.—A dredged channel leads from Green Bay across the bar at the mouth of the harbor to the deeper water inside. In 1965, the controlling depth was 3 feet (7 feet at midchannel).

Aids to Navigation.—The point north of the harbor entrance to Jackson Harbor is marked by a light 10,800 feet 215° from Pottawatomie Light. The entrance to Jackson Harbor from the east between Rock Island and Washington Island is marked on the east side with a buoy in about 24 feet of water located 12,400 feet 171° from Pottawatomie Light.

Rock Island, Wis.—This island is a State Park and is located 4½ miles southwesterly of St. Martin Island and just off the northeast corner of Washington Island, with which it is connected by a shallow bank. The west, north, and east sides of the island are steep-to. On the northwest point of the island is Pottawatomie Light, serving as a guide to the Rock Island Passage between Rock and St. Martin Islands. The light has a visible sector of from 200° through north to 095°. The probability of the light being obscure in the other sector is due to the elevation and density of foliage of Rock Island.

Fish Island and Fisherman Shoal.—About 2⅛ miles southeasterly of the southeast point of Rock Island lies Fish Island, surrounded by a rocky reef 1½ miles long north and south by ⅝ mile wide. About 1½ miles southwesterly of Fish Island and 2¼ miles southeasterly of the southeast point of Rock Island is Fisherman Shoal, with spots awash and extending about 1¼ miles in a northwest and southeast direction. Both reefs are menaces to vessels using Rock Island Passage. Fisherman Shoal buoy marks the southeasterly end of Fisherman Shoal. The channel between these reefs and Washington and Rock Islands is deep.

Rock Island Passage.—St. Martin Island Shoals lie to the southward of St. Martin Island and on the northeasterly side of Rock Island Passage. The shoalest spot, with only 7 feet of water, lies 2 miles southerly from the southeast point of St. Martin Island and 3 miles northeasterly from Pottawatomie (Rock Island) Light, with an 8-foot spot ⅜ mile northerly from it. From the 7-foot spot a narrow shoal with depth increasing to 20 feet extends southwesterly ⅜ mile, where it is marked by a buoy. A detached shoal, with least depth of 13 feet, lies 3¾ miles northeasterly from Pottawatomie Light, its southerly side marked by a buoy. A black and white vertically striped lighted gong buoy, equipped with radar reflectors and showing short-long white flashes, is located in deep water about 4⅛ miles easterly from Pottawatomie Light and marks the approach at the eastern entrance to the passage. The course from this lighted gong buoy is 270° into Green Bay.

St. Martin Island, Mich., is a wooded and hilly island 2¼ miles long northerly and southerly by 1¼ miles in greatest width, narrowing to about ¼ mile at its southeast end, from which a narrow spit projects southward for 1⅜ miles, with the detached St. Martin Island Shoals extending 1 mile farther south. The other shores of this island are deep-to.

St. Martin Island Light is located on the northeasterly end of the island, on the westerly side of St. Martin Island Passage. The light is visible from 135° to 355°, the dark sector covering the island. A diaphragm foghorn sounds as required. A radiobeacon is operated at the light station. The light station is equipped with long-distance telephone connection.

Gull and Little Gull Islands are situated on the north and south ends, respectively, of a shoal about 1 mile long

north and south by ¾ mile wide, with depths of 2 or 3 feet, lying about 2½ miles southwesterly of Poverty Island and 1½ miles east of the north end of St. Martin Island. About ¾ mile northerly from Gull Island is Gravelly Island, surrounded by shallow water, which is almost in continuation of that on which the Gull Islands are located. The channel between the two has about 17 feet available depth. A buoy is moored in 40 feet of water off the west side of the shoal area, at a point about 3,500 feet northwesterly from the north end of Gull Island. **Gravelly Island Shoals** comprise three detached spots to the north of Gravelly Island; the outer spot with 18 feet depth lies 1⅛ miles, one with 13 feet lies ¾ mile, and one with 14 feet lies ⅜ mile north of the island. Only light-draft vessels should undertake to pass through Poverty Island Passage.

St. Martin Island Passage, Mich.—This passage is included between Gravelly and the Gull Islands on the east and St. Martin Island on the west side. Little Gull Island buoy is moored in 60 feet of water about ½ mile south of the southerly point of Little Gull Island, and marks the southeasterly approach to the passage. Entrance through the St. Martin Island Passage is made on a 319° course starting from a point ⅝ mile south of Little Gull Island buoy and passing about 1 mile off the light.

Poverty Island Passage, Mich.—Poverty Island Light serves as a guide through Poverty Island Passage into Green Bay. Vessels bound for Green Bay should pass ¾ mile south of Poverty Island and immediately shape their course to pass between Poverty Island Shoal and Gravelly Island Shoal.

Poverty Island Shoal lies with its north end 2¼ miles northwesterly from the northwest point of Poverty Island, and has least depth of 13½ feet on it.

Poverty Island, Mich., is situated about 1 mile southwest of the south end of Summer Island, the available channel between the two being contracted to about ¼ mile width by the Summer Island spit, the good water being nearer to Poverty Island; this channel should not be attempted without local knowledge. The east and south sides of the island are clear to within 1,200 feet, and the west side, marked by a hill, is deep-to.

Summer and Little Summer Islands, Mich., are the most northerly islands in the Green Bay outlet, situated south of the end of the northerly mainland peninsula whose southeasterly extremity is **Point Detour, Mich.** These islands are hilly and wooded, lying about 1¾ miles apart in a northwest and southeast direction, connected by a sandy and stony flat, which also reaches across to the mainland, and on which there are depths of 1 to 3 feet between the two islands and generally 5 feet between them and the mainland. There is, however, a narrow channel abreast of the village of Fairport, near the mainland side of the passage, affording a 6-foot draft, but care must be exercised to avoid the 1-foot spot which is marked at its northwesterly end by a horizontally banded spar. From the west side of Little Summer Island, shoals reach offshore over 1 mile, and **Rocky Island** lies about ½ mile offshore in this shallow area. **Little Summer Island Shoal**, with 6 feet least depth, lies about 1 mile southwesterly from the south point of Little Summer Island. A shoal extends about 1 mile to the south from the south end of Summer Island, with 14 feet depth at its end. Summer Island Light, 37 feet above water on a white skeleton tower, marks the northeast point of Summer Island.

Section XIII.—East Shore of Green Bay From Porte Des Morts Southwest to the City of Green Bay, Wis.

Regional Charts: Chart 14900; Chart 14902; Coast Charts 14909 and 14910.

Chart 14909.—Coming through the Porte des Morts Passage, the mainland shore continues generally into the southwest along the Door County, Wis., peninsula to Sturgeon Bay. **Hedgehog Harbor** with deep water, sheltered from the south, is enclosed on the east by **Table Bluff** and on the west by **Deathdoor Bluff**, the northwest point of the southern mainland peninsula separating Green Bay from Lake Michigan. A detached 15-foot spot lies about 1,600 feet northerly off the bluff. **Gills Rock**, a small fishing settlement at the southeast corner of the harbor, is also a terminus of the ferry between the mainland and Washington Island, and **Rock Island**.

South of Deathdoor Bluff about 3½ miles is **Ellison Bluff** forming the southwesterly boundary of **Ellison Bay**, which opens to the north and northwest, has steep shores, and affords protection from south and east winds.

The shore line from Ellison Bluff to Eagle Bluff consists of bluffs with deep water close-to, except at a point 2 miles north of the head of **Sister Bay**, the indentation northeast of **Sister Bluffs**, where a split extends to the southwest about ½ mile. The outlying waters northwest of Sister Bluffs and Sister Bay are obstructed, however.

Sister Shoals, Sister Islands, and Horseshoe Reefs.—Sister Shoals comprise very shallow detached patches, lying about ¾ to 1¼ miles northwesterly from Sister Bluffs. A buoy marks the west point of the shoals at a point 3.6 miles northeasterly from Eagle Bluff Light. The Sister Islands, with the surrounding shoals, are ¾ mile from the shore at a point 2 miles north of the head of Sister Bay. A buoy marks the westerly extent of the shoal area extending 2,000 feet southerly from the islands. The Horseshoe Reefs, with 1 foot least depth and rocky, lie 2½ miles west of the Sister Islands, extending 2½ miles northeast and southwest, the southerly end being 2½ miles northerly from the north end of the point at Eagle Bluff. Horseshoe Reef buoy is placed at the southeasterly point of the reefs, in 5 fathoms of water, northeasterly 3¾ miles from Eagle Bluff Light. The sailing course passes between the buoy and the Sister Islands.

Eagle Harbor is a bay extending 2 miles into the shore east of Eagle Bluff, at its head is **Ephraim** post office. The head of this bay is shallow for ⅞ mile out, and there are some 16- and 17-foot spots in the deep area farther out. The outer part of the harbor affords good anchorage except in north and northwest storms. At the village of Ephraim there are a number of piers and a small boat basin that affords protection for small craft.

Horseshoe Island is situated in the westerly approach to the harbor about ½ mile northeast of the northerly termination of the point at **Eagle Bluff**; a light is located on the southwest point of the island. **Shanty Bay** opens just east of the point at Eagle Bluff and Eagle Bluff Light is located on the westerly side of the point at Eagle Bluff, 2¼ miles north of **Fish Creek Bay.**

The Strawberry Island group consists of four islands—Adventure Island (formerly known as Big Strawberry), Little Strawberry Island, Jack Island, and another very small island, with surrounding shoals, and extends north and south 3 miles along the shore from beyond the point at Eagle Bluff to above Fish Creek. A buoy, located about 2.5 miles southwesterly from Eagle Bluff Light, marks the southwest side of the shoal ground around Strawberry Islands. Strawberry Channel is marked by Eagle Bluff Light on the main shore, and by two buoys on the inner or most easterly points of the Strawberry Island shoals; one at the northeast end of the shoals, 1 mile northwesterly from Eagle Bluff Light, and the other buoy at the southeast end, 1½ miles southwesterly from the light. The channel at the latter buoy is quite narrow with no passage for vessels drawing over 13 feet, and the buoy must be passed close-to to avoid the offshore shoal.

Chambers Island is located about in the middle of Green Bay, to the westward of the Strawberry Islands. On its easterly face it is about 3¾ miles long, contracting toward the west side, which is about 1½ miles long; the island is 2 miles wide. Shoals extend 1¾ miles north from the north point of the island, marked at the outer end by a buoy. At the southwest corner, a shoal with 12 to 16 feet depth projects to the westward 1⅛ miles, its extremity being marked by a buoy. **Hanover Shoal,** a very shallow spit, runs 2 miles southeasterly from the southeast point of the island, with a buoy at its outer end, and a shoal with 8 feet least water lies off the east side, 1½ miles northeasterly from the southeast point. Strangers should not attempt to pass between Chambers and the Strawberry Islands. Chambers Island Light, exhibited from a white aluminum tower 67 feet high, stands on the western point of a small bay in the north side of the island, 100 feet 230° from the old Lighthouse Tower, and is a guide through the western passage between the island and the west shore of Green Bay.

Below the shallow inlet at the mouth of Fish Creek, the main shore is deep close-to, southerly to Egg Harbor. **Hat Island** is located 2¾ miles westerly off the shore at about the middle of this stretch, and 2½ miles northwesterly of the north point of Egg Harbor. Shoals extend ⅝ mile southeasterly from the island and Hat Island South Shoal, a detached rocky spot, awash, lies ¾ mile southerly from the island. Also, a 14-foot shoal lies in deep water about 1⅛ miles northeasterly from the island and 1⅝ miles offshore.

Strawberry Channel Mid-Channel Lighted Buoy is located 7,600 feet 089° from the eastern tip of Hat Island and marks the turn on the sailing course from the Strawberry Islands area to the city of Green Bay at the south end of Green Bay.

Egg Harbor is a deep indentation opening to the north and northwest about 11½ miles northeasterly of Sturgeon Bay.

Chart 14910.—The coast from Egg Harbor around Leroys Point is deep-to becoming shoaled below Leroy Point to just below Monument Shoal. In this shoal stretch are found numerous outlying patches with from 6 to 10 feet least depths over them, lying within a distance of about 1 mile from shore and with deep water inside them. Monument Shoal buoy marks the most westerly point of Monument Shoal, one of these patches located 7½ miles northeasterly from Sherwood Point Light at the Green Bay entrance to Sturgeon Bay and 7¼ miles southeasterly from Green Island Light. A 7-foot spot lies 1 mile south of Monument Shoal, and other spots are located northeasterly, distant 2 to 3 miles. From at least 3 miles north of Monument Shoal buoy, vessels bound southward should keep 2 miles offshore for a distance of at least 5 miles.

The coast from below Monument Shoal to Sturgeon Bay is deep-to for a distance of 5 miles, with the exception of a 17-foot spot about ⅝ mile offshore about 3 miles north of the bay.

Sturgeon Bay is a natural arm of Green Bay, but the aids and descriptions are placed and follow with respect to the waterway from the Lake Michigan entrance through to Green Bay.

Sherwood Point Light, marking the northwest point of the entrance into Sturgeon Bay from Green Bay, is shown from the outer end of **Sherwood Point**: an air diaphragm foghorn and a marker radiobeacon are operated at this station. **Sherwood Point Shoal,** marked at its northerly end by a buoy, lies 1.9 miles 314° from Sherwood Point Lighthouse. It is of boulder formation, about 700 feet in diameter on the 21-foot contour, and has a minimum depth of 11½ feet. Being detached and surrounded by deep water, it forms a menace to vessels navigating in this vicinity. Detached spots of this shoal area extend southerly about 4 miles from Sherwood Point Shoal to **Snake Island** including depths of 2 feet, 7 feet and 11 feet with varying depths elsewhere. On account of these shoals lying to the west of Sherwood Point, vessels approaching Sturgeon Bay from the southward should give this region a wide berth, passing outside of Sherwood Point Shoal.

High-Cliff Park, Wis.—A small privately maintained man-made harbor lies east of Sherwood Point Shoal and about 1½ miles southwesterly from Sherwood Point. A large prominent hip-roofed barn is located close to the shore just easterly of the harbor entrance. There is a rubble covered fill, about 200 feet in length, forming a breakwater on the westerly side of the entrance. The inbound course in the outer part of the entrance channel is about 213°. Depths of 4 feet in the entrance channel and harbor were reported in July 1978. Strangers should not attempt to enter the harbor because large boulders are reported to be in the entrance channel; local knowledge and caution are advised.

Southerly from Snake Island is a small bay having depths of 15 feet or more inside the land points forming

the bay. A dredged canal, 1,000 feet south of the outer end of the point, and 60 feet wide, runs across the point of land forming the west side of this bay, and the east side of Little Sturgeon Bay.

Little Sturgeon Bay.—This bay opens to the northward and has available depths of 7 to 17 feet. Buoys mark shoal water on the west side of the bay.

The shore from Little Sturgeon Bay about 7 miles to Red River Bluff is deep-to. From Red River Bluff to Red Banks, the shoals are generally from ¼ to ¾ miles in extent, but an outlying spot with not more than 10 feet depth is found 1⅜ miles from the shore about 3 miles northeasterly of Red Banks. **Dyckesville** is a small fishing settlement located about 5¼ miles northeasterly of Red Banks. The shoal water below Red Banks extends about 3 miles to **Point au Sable** just east of the marked channel through the lower section of Green Bay and entering into the Fox River in the city of Green Bay.

Section XIV.—Fox River, Including the City of Green Bay, Lake Winnebago and Wolf River, Wis.

Regional Charts: Chart 14900; Chart 14902; Coast Chart 14910.

Charts 14910, 14916, 14918.—Green Bay Harbor, Wis.—This harbor is located at the mouth of Fox River, at the head or south end of Green Bay, about 40 miles southwesterly from Sturgeon Bay and 75 miles from Porte des Morts Passage. It comprises the 6½ miles of river below DePere and an entrance channel about 11½ miles long dredged through the shoals in the head of the bay outside of the river mouth. The lower 3 miles of the river, extending through the city of Green Bay, is a naturally deep pool, requiring little improvement.

Channels.—The dredged entrance channel leads generally southwest through the upper part of Green Bay for about 11.5 miles to the mouth of Fox River and thence upstream for about 7.2 miles to a turning basin at DePere. Other turning basins are on the east side of the channel 1.4 miles above the mouth at the mouth of East River and on the west side of the channel 3.6 miles above the mouth just above the Chicago & North Western Railway bridge.

In May–July 1978, the controlling depth was 20 feet through the entrance channel to the mouth of the river, thence 20 feet to the Tilleman Memorial (formerly Mason Street) bridge with 15 feet in the East River turning basin, thence 16 feet to the Chicago & North Western Railway bridge, thence 20 feet to and in the turning basin just above the bridge, thence 8 feet to the turning basin at DePere, thence in 1977, 18 feet in the north part of the basin decreasing to 2 feet at the south limit and 1 foot at the west limit.

Caution Note.—The current in the river and bay varies from 0 to 3 miles per hour and may run in either direction. Temporary fluctuations of water level at times occur, due to wind and barometric pressure, of about 2½ feet above or below the mean lake level prevailing at the time. The channels are not adapted for anchorage of vessels. The improved channels are fairly stable, but require occasional dredging for maintenance.

East River.—This river, emptying into the Fox River immediately above the Green Bay & Western Railroad bridge in the city of Green Bay, is navigable in a narrow and tortuous channel to Baird Street bridge, 1.35 miles above the mouth, which is the nominal head of navigation. The width within this reach varies from 100 to 200 feet and the least depth in the channel of best water is about 6 feet.

Aids to Navigation.—Green Bay Harbor Entrance light is on the westerly side of and a guide into the dredged channel leading to the Fox River. A diaphragm foghorn and a radiobeacon are operated at this station. A buoy marks the easterly bank opposite the entrance light. From the point between the entrance light and the buoy easterly thereof, the channel into the Fox River at Green Bay is well marked with buoys and lights in the straight sections and at the turns through the project area in the bay and into the river.

Above Green Bay, the dredged channel to **De Pere** is marked by buoys placed along its westerly edge and buoys placed along its easterly edge, and also by buoys on the westerly side at the first and third turns above the Chicago & North Western Railway bridge, and by a buoy on the easterly side at the second turn. A buoy marks the westerly side of the dredged channel at the entrance to the turning basin at De Pere.

Disposal Area.—In September 1978, a crescent shaped diked disposal area was under construction about 1 mile east of the mouth of Fox River.

Harbor Facilities.—Gasoline is available at dockside pumps at three places in Green Bay Harbor. A 16 ton capacity hoist is also available.

The Fort Howard Paper Co. stiff leg derrick of 100 ton capacity and accessible to truck and rail service is available at the Port of Green Bay. Arrangements for the use of this derrick must be made through the paper company.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Green Bay, Wis., is contained in the **Port Series No. 48** (Revised 1973) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Coast Guard Station.—Green Bay Coast Guard Search and Rescue Detachment, seasonally operated, is on the east side of the Fox River at its mouth.

An old wooden hulk about 100 feet long lies on the east bank, about mile 2.95, approximately midway between the C.M. St. P. & P. RR and the C. & N.W. Ry., bridges, with its bow headed in to the bank and about 50 feet off the shore and its stern about 150 feet offshore. In 1961, the depth over the stern was about 12 feet and, in July 1978, the bow was reported at about low water datum.

Structures Across Green Bay, Fox River Below De Pere, East River

No.	Location and name	Kind	Miles above mouth of river	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	Fox River								
1	Aerial cable	Electric	0. 07				155. 2	151. 2	Wis. Public Service Corp.
1A	Tower Drive I-43	Highway	0. 41				120. 0		Fixed. Under construction March 1977.
2	Aerial cable		0. 43				159. 2	155. 2	Wis.-Mich. Power Co.
3	Sub. pipeline		0. 43						
4	Sub. cable		0. 57						
5	do		1. 02						
6	Green Bay & Western RR & C & NW RR (Eastman Ave.).	Railway	1. 02	85. 6	85. 0		7. 5		See note 1.
	Fox River-East River	Junction	1. 28						
7	Sub. pipeline		1. 49						
8	do		1. 52						
9	Sub. cable		1. 56						
10	Main St. Bridge	Highway	1. 57			87. 3	12. 3		See note 2.
11	Sub. cable		1. 58						
12	Sub. pipeline		1. 68						
13	do		1. 71						
14	Sub. cable		1. 79						
15	Walnut St. Bridge		1. 80			78. 0	9. 0		See note 3.
16	Sub. cable		1. 81						
17	Sub. pipeline		1. 97						
18	Sub. cable		2. 00						
19	do		2. 01						
20	Aerial cable	Electric	2. 02				53. 1	149. 1	Wis. Public Service Corp.
21	Sub. cable		2. 07						
22	Sub. pipeline		2. 23						
23A	Tilleman Memorial bridge	Highway	2. 26			124. 0	30. 0		Bascule. See note 3.
23B	Sub. pipeline (24″)	Water	2. 31						
24	Sub. pipeline		2. 32						
25	Sub. cable		2. 58						
26	do		2. 60						
27	C. M. St. P. & P. RR	Railway	2. 60	75. 0	75. 0		8. 3		See note 4.
28	Sub. cable		2. 62						
29	Sub. pipeline		2. 68						
30	do		2. 72						
31	do		2. 83						
32	Sub. cable		3. 28						
33	C & NW RR Bridge	Railway	3. 30	75. 0	75. 0		31. 1		
33A	Allouez & Ashwaubenon bridge.	Highway	5. 10			150. 0	60. 0		Fixed.
33B	Sub. pipeline		5. 60						

See footnotes at end of table.

Structures Across Green Bay, Fox River Below De Pere, East River—Continued

No.	Location and name	Kind	Miles above junction with Fox River	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
	East River								
34	do		6.20						
35	Aerial cable		7.16				69.4		
36	Aerial cable	Electric	0.12				66.2	66.2	Wis. Public Service Corp.
36A	Sub. pipeline		0.19						
37	do		0.21						
38	Monroe Ave. Bridge	Highway	0.25			60.0	13.0		See note 6.
39	C, M, St. P. & P. RR (Elm St.).	Railway	0.30	60.3	60.3		6.0		See note 5.
40	Sub. cable		0.32						
41	Sub. pipeline		0.35						
42	Aerial cable	Electric	0.41				61.2	57.2	Wis. Public Service Corp.
43	Sub. cable		0.59						
44	Sub. pipeline		0.60						
45	Webster Ave. Bridge	Highway	0.61			41.5	10.4		Fixed.
46	Sub. pipeline		0.87						
47	C, M, St. P. & P. RR	Railway	0.89	60.0			7.5		See note 5.
48	Sub. cable		0.97						
49	Main St. Bridge	Highway	0.98			60.0	7.2		Fixed.
50	Sub. pipeline		1.18						S. Irwin Ave.
51	Sub. cable		1.20						S. Irwin Ave.
52	Baird St. Bridge		1.35		40.0		10.3		Fixed.
53	Sub. pipeline		1.45						
54	East River-Baird Creek	Junction	1.72						(Head of navigation).
55	Aerial cable	Electric	2.01						Wis. Public Service Corp.
56	Sub. cable		2.08						
57	Aerial cable		2.19						
58	Mason St. Bridge	Highway	2.21			124.0	32.5		Bascule.
59	Sub. pipeline		2.22						
60	Aerial cable	Electric	2.32						Wis. Public Service Corp.
61	Sub. cable		2.32						
62	Aerial cable		3.38						
63	C & NW RR	Railway	3.39				13.6		Fixed.

NOTE 1.—One red light on each side and one on each end of protection piling of center pier; one red light on each end of protections to abutments; three lights on top of center of bridge show red up and down stream when bridge is closed and green when bridge is open. Signal lights are located over the center swing pier at the top of the bridge structure. If the draw of the bridge cannot be opened promptly upon signal, the bridge tender will indicate the delay by actuating the signal device which will display a flashing red light during the day and night. The red lights will continue to flash until the span is open, at which time the signal light will display a flashing green light. If the red lights cannot be operated due to malfunctioning, the bridge tender will signal with a red flag by day and a red light by night to indicate a delay in opening the draw span.

NOTE 2.—Two-leaf bascule. Red light on each end of piers at sides of lift span; one light on each side of free

end of each leaf shows red when bridge is closed and green when open.

NOTE 3.—Bascule. One light on each side of free end of leaf shows red when bridge is closed and green when open; one red light on each end of each abutment.

NOTE 4.—One red light on each side and one on each end of protection piling of center pier; one red light on each end of protections to abutments; three lights on top of center of bridge show red up and downstream when bridge is closed and green when bridge is open. Signal lights are located on the bridge tender's house over the center swing span, and consist of two red lights on both sides of the bridge. If the draw cannot be opened promptly upon signal, the bridge tender will acknowledge receipt of signal and indicate the delay in opening by actuating the signal device which will display alternately flashing red lights during the day and night. The red lights will continue to flash alternately until the bridge is in an open position at which time the lights will stop flashing indicating that the draw is open. If the red lights cannot be operated due to malfunctioning, the bridge tender will signal with a red flag by day and a red light by night to indicate a delay in opening the draw span.

NOTE 5.—Left draw not available. One light on top of bridge above pivot pier shows red up and down stream when bridge is closed and green when bridge is open; one red light on each corner of channel side of center pier; one red light on each corner of right approach pier.

NOTE 6.—Bascule. (converted to fixed in 1969. See 33 C.F.R. § 117.644).

Bridge Signals.—The local tug men have adopted whistle signals for the different bridges, as follows:

Railroad bridges over Fox River and East River bridges, 3 long (— — —).

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding, and 33 CFR § 117.643(a) and § 117.644 of Rules and Regulations, preceding.

Local Harbor Regulations are established by the city of Green Bay, Wisconsin, and enforced by the Port Director who can be reached at the Brown County Board of Harbor Commissioners, The Port of Green Bay, Wisconsin, Courthouse, Green Bay, Wisconsin 54301. Copies of the regulations can be obtained from the Port Director.

City Regulations Affecting Bridges, Adopted March 19, 1929, May 6, 1947 and September 20, 1977

Section 1. (a) Except on Sundays and legal holidays, the draws of bridges will not be required to open from 7:00 a.m. to 8:00 a.m., from 12:00 noon to 1:00 p.m., and from 4:00 p.m. to 5:00 p.m.: Provided, that the draw shall be opened promptly at all times for the passage of vessels carrying United States mails, vessels belonging to the United States, vessels of 300 short tons or over cargo capacity engaged in commercial transportation and their attendant towing tugs, and tugs or fireboats when responding to emergency calls.

(b) Except as provided in paragraph (a), the draws shall be opened promptly upon signals, given by blasts of a horn, steam whistle, or other approved signaling device as follows: For Main Street Bridge, two short blasts followed by one long blast; for Walnut Street Bridge, one long blast followed by two short blasts; for Mason Street Bridge, one long blast followed by one short blast and one long blast.

(c) In case the draws cannot be opened immediately when the signals are given, a red flag or ball by day, or a red light by night, shall be conspicuously displayed.

Sec. 2. No vessel, craft, or float shall approach or pass through any such bridge at a greater speed than 5 miles per hour.

Sec. 3. On each of the several bridges across Fox River there shall be placed and affixed, in addition to the lights and devices heretofore required and used, a red ball in the daytime and an oil-burning lantern reflecting a red light in the nighttime. Such ball and lantern shall be attached to a staff, pole, or framework to be erected on the superstructure of the bridge, on or near the bridge house, in such a manner as to enable them to be raised or lowered above such superstructure by the bridgetender. Said ball and lantern shall be of such size and so placed that when elevated above the framework of the bridge the ball in the daytime and the red light by night can be readily seen from the river both above and below the bridge.

Sec. 4. Such ball in the daytime and said oil lantern at night shall be kept aloft at all times except when lowered for the passage of vessel, craft, or float through said bridge, and when so aloft shall constitute and be the tender's signal requiring any approaching vessel, craft, or float to stop before striking said bridge.

Sec. 5. Upon receiving a signal from a vessel, craft, or float desiring to pass through the bridge, the bridgetender, if said bridge can be promptly opened, shall immediately lower such ball or lantern to a position where it is screened from sight of the approaching vessel, craft, or float, and such lowering shall be the signal to the approaching vessel, craft, or float that such bridge will be opened and that such vessel, craft, or float may proceed toward such bridge. If for any reason the bridgetender cannot open such bridge in response to proper signals so to do, he shall not lower such ball or lantern, and if, having lowered it, he shall be unable then to open said bridge he shall immediately hoist such ball or lantern, and in either case such approaching vessel, craft, or float shall immediately stop and wait until such ball or lantern be lowered as a signal to proceed. No act on the part of any bridgetender, nor of any other person, in the daytime other than the lowering of such ball nor in the nighttime other than the lowering of said lantern shall be construed to be an invitation to any vessel, craft, or boat to proceed to and through said bridge or as an indication that such bridge will be opened.

Sec. 6. It shall be unlawful for the owner or owners, officer or officers, or other person or persons in charge of

any vessel or vessels, craft, or float navigating Fox River to approach any nearer to any of the bridges over the said river than to a point at a distance from such bridge within which such vessel can be stopped without colliding with such bridge while said signal ball is up or elevated in the daytime or while said red lantern light is up or elevated in the nighttime.

Sec. 7. Any bridgetender or other person in charge of any such bridge who shall fail or neglect to promptly raise or lower such bridge signal ball or signal light, as above provided, or who shall knowingly or intentionally fail or neglect to open any such bridge as herein above provided shall, upon conviction thereof, be punished by a fine of not less than $5 nor more than $10, or be imprisoned in the county jail for not to exceed 30 days.

Sec. 8. Any person or persons who shall violate any of the provisions of this ordinance, excepting bridgetenders or other persons in charge of such bridges, as in the last section above provided, shall be chargeable with whatever damage may result to the city by reason of any such violation and shall also be subject to a penalty of $100 for each and every such violation; and in case the same person or persons shall violate such provisions, or any of them, a second or more times, the court before which the trial is had may, in addition to the penalty of fine authorized as aforesaid, also imprison such offender or offenders in the county jail not exceeding 3 months.

Chart 14916.—The Fox River flows through Lake Winnebago. The portion of the river below the lake flows a distance of 39 miles to Green Bay and has a navigable depth of six feet. The upper portion of the river flows into Lake Winnebago at the city of Oshkosh, Wis., and is navigable by shallow draft boats for a distance of about 10 miles to the mouth of the Wolf River.

Lake Winnebago, Wisconsin is a large shallow body of water 28½ miles in length and having a maximum width of 10½ miles and a maximum charted depth of 20 feet. The principal harbors which have depths of 6 feet and are generally 100 feet wide are **Neenah** and **Menasha**, located at the northerly end of the lake at the outlet; Oshkosh, situated at the mouth of the Upper Fox River midway on the west shore; **Fond du Lac**, at the head of the lake; and **Calumet Harbor**, on the eastern shore about 9½ miles from Fond du Lac. Lighted aids to navigation are maintained at all of these harbors and are described in the Great Lakes Light List, a publication of the U.S. Coast Guard, 9th District, Cleveland, Ohio. **Stockbridge Harbor** and **Brothertown Harbor** are two small harbors on the eastern shore, located near towns of the same name.

Anchorage Regulations.—See 33 CFR § 110.1 and § 110.79a of Rules and Regulations, preceding.

An aerial transmission line crosses the river channel at Fond du Lac Harbor at a point about 2,800 feet above the mouth. This transmission line has a minimum vertical clearance of 60.0 feet above standard low water and 56.2 feet above high water.

In the northeast section of Lake Winnebago, at Clifton, is the High Cliff State Forest Park. A small boat harbor marked by breakwater lights and private range lights, is located at the park. The Park Front Range Light is shown 30 feet above the water and the Park Rear Range Light is 30 feet above the water and 500 feet 043° from the front light.

High-water periods on the Fox River, with currents up to 3 to 5 miles per hour, continue for about 2 months on the average, beginning the latter part of March and extending into May. The low-water periods on the river average about 40 days, beginning in July and extending into September.

Improvement Work.—The present improvement by the United States above Green Bay Harbor inner channel is confined to the Fox River from De Pere to the mouth of the Wolf River and on the Wolf River to New London, Wisconsin.

The Federal Government in June 1962 transferred to the State of Wisconsin all Federal projects structures, appurtenances, and real property of the Upper Fox River, Wisconsin, above its juncture with the mouth of the Wolf River, and the Federal laws, other than the Federal Power Act (16 USCA 791a et seq.) governing the protection and preservation of navigable waters no longer apply to that reach. Water control structures have been erected on the upper Fox River at Ft. Winnebago, Governor Bend, Montello, Grand River, Princeton, White River and Berlin to maintain the pools above as the locks at these locations have been removed. The lock at Eureka is operated on weekends and holidays from 25 May through 30 September annually by the Berlin Boat Club, Inc., Berlin, Wis. Hand operated haulovers are available at Montello, Grand River, Princeton, White River, Berlin and Eureka to move small craft between pools.

The rise from Low Water Datum in Green Bay to normal pool level of Lake Winnebago is about 168.3 feet; on this section of 39 miles there are 17 locks (also 2 guard locks), with available length of 144 feet, available width of 35 feet, and depth over breast walls of 6 feet at normal pool level. Lockage service on the lower Fox River between Menasha and De Pere, is provided from about 1 May to 31 October as determined by the District Engineer, in accordance with paragraph 4, of the Fox River Regulations. From the Menasha lock through Lake Winnebago to Oshkosh, where the Fox River enters that lake, the distance is 19.3 miles. The latest known controlling depth from De Pere to the mouth of the Wolf River is 6 feet at normal pool level. The practical draft for vessels is about 0.5 foot less than the controlling depth.

Dry Dock.—There is one dry dock on the Fox River, located adjacent to Kaukauna third lock. This dock is owned by the United States and publicly available under regulations noted below. It is provided with regular wooden lock gates, and is filled by gravity through valves in the gates and emptied through a concrete culvert into the pool below the third lock. The walls of the basin are rubblestone masonry 12 inches wide, the head walls are smooth. The dimensions are:

Length: 142 feet over all, 132 feet on keel blocks.

Width at top: 91 feet upper end, 173 feet lower end.

Data Relating to Bridges Over Fox River, Wisconsin

No.	Location and name	Kind	Miles above mouth of river	Draw openings—clear width			Fixed spans	Height of lowest part of superstructure above—		Remarks
				Right*	Left*	Center	Number	Standard low water	Extreme high water	
	[For bridges below De Pere, see Green Bay Harbor]			*Feet*	*Feet*	*Feet*		*Feet*	*Feet*	
1	De Pere—George St	Highway	7.2	------	------	75	------	24.74	21.34	See Note 1.
2	Wrightstown—Village	do	17.4	------	------	70.3	6	16.1	7.1	See Note 2.
3	Kaukauna—Chicago & North Western Ry.	Railway	23.4	40	(†)	------	------	14.0	14.0	See Note 3.
4	Kaukauna—Wisconsin Ave	Highway	23.8	------	------	90.2	------	7.55	3.75	See Note 4.
5	Kaukauna—Lawe Ave	do	23.9	------	------	90.3	------	23.4	19.6	See Note 5.
6	Little Chute—Mill St	do	26.6	------	------	35.4	------	4.7	0.5	See Note 6.
7	Kimberly—Little Chute	do	26.75	------	------	143.5	8	54.2	50.0	See Note 7.
8	Appleton—College Ave	do	30.8	------	------	------	13	54.6	50.0	See Note 8.
9	Appleton—Chicago & North Western Ry.	Railway	31.1	59.8	†60.6	------	------	4.7	—.1	See Note 9.
10	Appleton—South Lawe St	Highway	31.4	------	------	70	------	3.5	2.5	See Note 5.
11	Appleton—South Oneida St	do	31.7	------	------	70	------	10.0	8.0	See Note 10.
12	Appleton—Memorial Dr	do	32.37	------	------	------	8	62.9	59.57	See Note 11
13	Appleton—Chicago, Milwaukee, St. Paul & Pacific RR.	Railway	32.4	61	60	------	29	9.25	5.92	See Note 12.
13A	Little Lake Butte des Morts	Highway	36.00	------	------	215.0	18	54.2	50.9	Fixed. See Note 20.
14	Menasha—Soo Line RR (Minn., St. P. & S. Ste. M.) and Chicago, Milwaukee, St. Paul & Pacific RR.	do	37.26	(†)	60	------	------	3.97	.17	See Note 13.
15	Menasha—Tayco St	Highway	37.51	------	------	100	------	3.80	2.20	See Note 5.
16	Menasha—Racine St	do	37.81	------	------	101	8	3.67	0	Double-leaf bascule.
17	Oshkosh—Chicago & North Western Ry.	Railway	56.02	70	70	------	2	6.5	2.8	See Note 14.
18	Oshkosh—Main St	Highway	56.27	------	------	89.6	------	11.8	8.0	See Note 15.
19	Oshkosh—Jackson	do	56.52	------	------	97	4	11.8	8.0	See Note 16.
20	Oshkosh—Soo Line RR (Minn., St. P. & S. Ste. M.).	Railway	56.88	67.4	68.7	------	13	5.4	1.6	See Note 17.
21	Oshkosh—Wisconsin St	Highway	57.03	------	------	75	6	12.0	8.2	See Note 18.
22	Oshkosh—Congress Ave	do	58.31	------	------	75	6	12.9	9.1	See Note 16.
23	Lake Butte des Morts (U.S. 41).	do	59.60	------	------	76	9	31.8	28.2	See Note 19.
24	Lake Butte des Morts	do	59.61	------	------	76	9	31.8	28.2	See Note 19.

*Looking downstream. †Not available.

Bridge Signals.—The signal for opening draws is three distinct whistles (— — —) for all bridges except Main Street bridge at Oshkosh, for which the signal is four distinct whistles (— — — —).

NOTE 1.—Double-leaf bascule. One red light on each end and center of each abutment; 1 light on each side of free end of each leaf, showing red when closed and green when open.

NOTE 2.—Double-leaf bascule. One red light on each pile cluster above and below bridge; 1 red light on center of each fender; 1 light on each side of free end of each leaf, showing red when closed and green when open.

NOTE 3.—Two lights on channel side of draw at ends, showing red when closed and green when open; 1 red light on channel side of center pier; 1 red light on face of right abutment; 1 red light on lower end of center protection pier.

NOTE 4.—Vertical lift, clear height in raised position, 65 feet above low water and 61.2 feet above high water. One light on each side of draw at center, showing red when closed and green when open; 1 red light on each end of right and left abutments.

NOTE 5.—Double-leaf bascule. One red light on each end of piers; 1 light on each side of free end of each leaf, showing red when closed and green when open.

NOTE 6.—Single leaf bascule. One red light on each side of piers, both upstream and downstream. One light in center of leaf showing red when closed and green when open.

NOTE 7.—Fixed bridge. One blue light at center and one red light each side of channel on upstream and downstream side of bridge.

NOTE 8.—Fixed bridge. One green light at center and one red light on each side of channel on upstream and downstream side of bridge.

NOTE 9.—Two lights on channel side of draw at ends, showing red when closed and green when open; 2 red lights on face of right abutment; 2 red lights on channel side and near ends of center protection pier.

NOTE 10.—Single leaf bascule. One light on each side of free end of leaf showing red when closed and green when open; one red light on each end of protection to abutments. Signal lights have been installed for acknowledging the signal of vessels requiring the bridge to be opened and to indicate whether or not the bridge can be opened immediately. The signals are mounted on the upstream and downstream sides of the bridge on the bottom girder of the leaf and are located in line with the center of the channel. The signal lights will operate during the evening rush hour period from 4:00 p.m. to 5:30 p.m. Upon signal from vessel operators the bridge tender will actuate either an amber light or a red light. The amber light will indicate that the bridgetender has heard the signal and is proceeding to open the bridge draw. The red light will indicate that the bridgetender has heard the signal and that there will be a short delay in opening the bridge draw to clear the bridge of vehicular traffic. Commercial and construction equipment tows will not be delayed, and all other vessels will not be delayed longer than 15 minutes.

NOTE 11.—Fixed bridge, crosses over bridge No. 14, has clear widths of 90 feet on left and 75 feet on right of lighted pier, both sides available, but right seldom used. One red light on each side of downstream end of the pier which is an extension of center protection pier of bridge No. 14.

NOTE 12.—Both draws available, but right draw seldom used. Two lights on top and in center line of draw near ends, showing red when closed and green when open; 3 red lights on each side of center protection pier, at ends and center, 1 red light on each end of left abutment; 1 red light on upper end of right abutment.

NOTE 13.—Two lights on each side of draw at ends, showing red when closed and green when open; 1 red light on channel side of center pier; 2 red lights on face of left abutment.

NOTE 14.—Three lights on top and in center line of draw, showing red when closed and green when open; 1 red light on each side of center pier; 1 red light on each end of right and left abutments; 1 red light on each end of center protection pier.

NOTE 15.—The original bridge structure was removed in 1971. In 1973, a new double leaf bascule bridge was constructed to replace the former structure.

NOTE 16.—Double-leaf bascule. One light on each side of free end of each leaf of draw, showing red when closed and green when open; 1 red light on each end of each protection to abutments.

NOTE 17.—Three lights on top and in center line of draw, showing red when closed and green when open; 1 red light on each side of center pier; 1 red light on each side of right and left abutments; 1 red light on each end of center protection pier.

NOTE 18.—Double-leaf bascule. One light on each side of free ends of each leaf of draw, showing red when closed and green when open; 1 red light on each end of each protection to abutments; 1 red light on channel side at center of each abutment.

NOTE 19.—Fixed span bridge and connecting causeway across Lake Butte des Morts, near Oshkosh, Wis.

Width at bottom: 64 feet upper end, 125 feet lower end.

Width at entrance: 35 feet.

Depth on sill: 6 feet.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding, and 33 CFR § 117.643(b) of Rules and Regulations, preceding.

Navigation Regulations.—See 33 U.S.C. 1, published in Certain Laws, preceding, and 33 CFR § 207.460(a) of Rules and Regulations, preceding.

Dry Dock Use Regulations.—See 33 U.S.C. 1, published in Certain Laws, preceding, and 33 CFR § 207.460(b) of Rules and Regulations, preceding.

City of Menasha Bridge Regulations

Section 1. It shall be unlawful for any person, persons, firm, partnership, or corporation to operate a boat upon the Government Canal within the corporate limits of the city of Menasha in such manner as to require the opening of the Racine Street or Washington-Tayco Street drawbridges during the following hours: 12:00 midnight to 8:00

a.m.; 11:50 a.m. to 12:10 p.m.; 12:45 p.m. to 1:00 p.m. and 3:40 p.m. to 4:15 p.m.

Sec. 2. Any person, persons, firm, partnership, or corporation violating the provisions of section 1 shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by a fine not to exceed $25 or by imprisonment in the county jail not more than 30 days, or by both such fine and imprisonment.

Wolf River, Wis., a tributary of the Fox River, flows into the upper Fox River at **Winneconne**, about 10 miles above Oshkosh. Wolf River has a project depth of 4 feet to New London, about 47 miles above the junction with upper Fox River. Its banks vary in height from 4 to 10 feet above low-water surface; the river in flood stage rises from 6 to 12 feet above the summer stage, and during freshets the banks are generally overflowed.

Aerial Electric Transmission Lines Crossing Fox River, Wis.

No.	Location	Across—	Clear height above—		Owner
			Standard low water	High water	
	[Below De Pere—See Green Bay Harbor]		*Feet*	*Feet*	
1	De Pere—above lock	Canal	69.4	64.8	Wisconsin Public Service Corp.
2	Little Rapids—100 feet below Little Kaukauna Lock.	do	77.3	73.0	Do.
2A	Little Rapids—1,200 feet below Little Kaukauna lock.	River	85.0	80.7	Do.
2B	Little Rapids—1,660 feet below Little Kaukauna lock.	do	83.4	79.1	Do.
3	Wrightstown—300 feet below highway bridge	River	80.0	75.0	Do.
3A	Wrightstown—1,700 feet above Rapide Croche Lock.	do	102.1	95.7	Wisconsin Electric Power Co.
4	Kaukauna—lower end of 1st (upper) lock	Canal	80.0	79.5	Kaukauna Elec. & Water Dept.
5	Combined Locks—125 feet above locks	do	75.5	75.0	Do.
5A	Combined Locks—2,000 feet above locks	do	70.5	69.5	Do.
6	Little Chute Guard Lock	do	74.2	70.0	Do.
7	Kimberly—600 feet below lock	do	82.6	78.4	Wisconsin-Michigan Power Co.
7A	Kimberly—0.57 miles above lock	River	106.6	101.8	Do.
8	Appleton—0.9 mile below 4th lock	River	85.9	81.0	Do.
9	Appleton—375 feet below 3d lock	Canal	73.5	70.0	Do.
9A	Appleton—140 feet above 3rd lock	do	69.0	63.2	Do.
10	Appleton—125 feet above 1st (upper) lock	do	83.2	80.0	Do.
11	Appleton—2.5 miles above 1st (upper) lock	River	64.9	60.0	Do.
12	Appleton—2.7 miles above 1st (upper) lock	do	56.0	51.1	Do.
13	Menasha—1,100 feet above lock	Canal	75.0	71.2	Menasha Electric & Water Utilities.
14	Menasha—1,145 feet above lock	do	64.9	61.1	Marcus C.A.T.V.
15	Menasha—1,210 feet above lock	do	81.2	77.4	Wisconsin-Michigan Power Co.
15A	Menasha—25 feet above the Racine St. bridge	River	60.3	56.5	Menashe Electric & Water Utilities.
16A	Oshkosh—57 feet below Soo Line RR bridge (Minn. St. P. & S. Ste. M.).	do	72.5	73.9	Wisconsin Public Service Corp.
17	Oshkosh—0.5 mile above the Wisconsin St. bridge.	do	86.7	82.9	Do.
18	Oshkosh—27 feet below Lake Butte Des Morts Highway bridge.	do	78.2	75.0	Do.

Section XV.—West Shore of Green Bay From the City of Green Bay, Wis. to Ford River, Mich.

Charts 14918, 14910.—The head of Green Bay from the City of Green Bay northerly for about 3½ miles to Long Tail Point on the west and Sable Point on the east, is filled by a shallow expanse through which the entrance to the Fox River has been dredged.

Long Tail Point, a low ridge submerged in places, reaches southeasterly about 3 miles from the shore line just south of the mouth of the Big Suamico River and forms the northwesterly edge generally of the shallow area.

Duck Creek is a small stream flowing in an easterly direction into Green Bay about 1½ miles northwest of the mouth of Fox River. It is considered navigable for small craft for a distance of about 2.7 miles above its mouth, with width varying from about 100 to 200 feet and depth from 3 to 12 feet, reducing to 1 to 2½ feet through marshy areas near the mouth.

Chart 14910.—Big Suamico River, Wis., is a small stream which flows in an easterly direction into Green Bay about 8 miles north of Green Bay Harbor.

Channels.—A dredged entrance channel leads from deep water in Green Bay to the mouth of the river and thence upstream for 0.3 mile. In March 1978, the controlling depth was ½ foot in the entrance and river channels.

Structures across the Wolf River

No.	Location and name	Kind	Miles above mouth of river	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above		Remarks
				Right	Left	Center	Standard low water	High water	
1	Winneconne—Aerial cable	Electric	2. 18				89. 0	82. 0	Wis. Power and Light.
2	do	do	2. 37				75. 0	68. 0	Do.
3	Winneconne—Bridge	Highway	2. 43			70. 1	7. 0	2. 8	Double-leaf bascule.
4	Fremont—Aerial cable	Electric	20. 93				71. 7	64. 8	Wis.-Mich. Power Co.
5	do	do	22. 38				82. 5	75. 0	Do.
6	Fremont—Bridge	Highway	22. 43			70. 3	10. 6	3. 1	Single-leaf bascule.
7	Fremont—Aerial cable	Electric	22. 44				60. 4	53. 0	Weyauwega Tel. Co.
8	Gills Landing—Aerial cable.	do	27. 70				68. 5	60. 0	Wis.-Mich. Power Co.
9	Gills Landing—Soo line R.R. (M. St. P. & S. St. M.).	Railway	27. 83	56. 5	56. 5		9. 5	0. 3	24 hr. advance notice Tele. (715) 344–1910.
10	Gills Landing-Aerial Cable.	Electric	27. 84				47. 0	38. 5	Soo Line R.R. Co.
11	Northport—Bridge	Highway	42. 70			96. 0	15. 9	5. 3	Fixed.
12	Northport—Aerial cable	Electric	42. 72				35. 8	25. 2	Wis. Tel. Co.
13	do	do	42. 74				68. 6	58. 0	Wis.-Mich. Power Co.
14	New London-Shawno Street Bridge.	Highway	46. 13			62. 0	15. 0	3. 0	Fixed.
15	New London—Aerial Cable.	Electric	46. 37				67. 0	55. 0	City of New London.
16	New London-Pearl St. Bridge.	Highway	46. 43			100. 0	15. 5	3. 5	Fixed.
17	New London—Aerial cable.	Electric	46. 63				58. 4	46. 4	Wis.-Mich. Power Co.

Bridge Signal.—The signal for opening draws is three distinct whistles (— — —) for all bridges.
Bridges are lighted according to U.S. Coast Guard regulations for lighting bridges. See U.S. Coast Guard Light List.

Data Relating to Bridges Over Wolf River, Wis.

No.	Location and name	Kind	Miles above mouth of river	Draw openings—clear width		Fixed spans		Height of lowest part of superstructure above—		Lights—Description and location	Rules and regulations for opening prescribed by—	Remarks
				Right*	Left*	No.	Clear opening between piers	Standard low water	Extreme high water			
				Feet	*Feet*		*Feet*	*Feet*	*Feet*			
1	Winneconne	Highway	2.43	(See remarks.)	------	8	------	7	2.8	One red on each end and center of each abutment; one on each side of free end of each leaf, showing red when closed and green when open.	United States and State.	Double-leaf bascule with clear draw opening of 70.1 feet. Fixed spans are approaches to draw.
2	Fremont	do	22.43	do.	------	4	161	20.0	12.5	One red light at each end of the easterly two piers and one green light at midspan downstream and upstream.		Navigation through fixed span is 50 feet to east of center pier.
3	Gills Landing—Soo Line RR (Minn., St. P. & S. Ste. M.).	Railway	27.83	56.5	56.5	2	------	9.5	0.3	One on top of draw on channel side, showing red when closed and green when open; one red on face of right abutment and one red at each end of center portion pier.	United States and railway company.	Operated on a 24-hour advance notice. Request openings by calling 715/344-1910.

4	Northport	Highway	42.70	------	------	----	96	15.9	5.3	One green on center span; one red light on piers each side of center span downstream and upstream.	----------	Fixed bridge.
5	New London—Shawno Street.	-----do---	46.13	------	------	----	62	15.0	3.0	Two green on both center spans; one red light on piers each side of both center spans downstream and upstream.	----------	Do.
	New London—Pearl Street.	-----do---	46.43	------	------	2	100	15.5	3.5	Two green on each center span; one red light on center pier downstream and upstream.	----------	Do.

*Looking downstream.

Bridge Signal.—The signal for opening draws is three distinct whistles (— — —) for all bridges.

Aids to Navigation.—A buoy marks the south side of the entrance to the dredged channel, and a buoy also marks the north side at the bend.

Bridge.—A fixed highway bridge with vertical clearance of 10.6 feet crosses the Big Suamico River 1½ miles above its mouth at Suamico, Wis.

From Big Suamico River to Pensaukee, a distance of about 14 miles, the coast is bordered by shoals generally 3 miles in extent and of scant depth in places to less than 2 feet.

Little Tail Point, about 3½ miles northerly of Big Suamico River, is a narrow ridge nearly level with the water surface and extending 1¾ miles southeasterly from shore.

Little Suamico River is a small stream entering Green Bay about 5 miles north of Big Suamico River.

Pensaukee Harbor, Wis., is at the mouth of **Pensaukee River,** on the west shore of Green Bay about 14 miles northerly of Big Suamico River.

Channels.—A dredged entrance channel leads from deep water in Green Bay to the mouth of the river. In February 1978, the controlling depth was 2 feet at midchannel.

Aids to Navigation.—Pensaukee Harbor Light is on the old north pier ruins. A buoy is located 3,400 feet 113° from Pensaukee Harbor Light in 12 feet of water to mark the entrance to the channel in Green Bay to the mouth of the river.

Pensaukee Shoal, with 4 feet or less water on it, extends southeasterly from the shore, its outer end being about 3¾ miles southeasterly from Pensaukee Harbor Light.

Wreck.—The steamer **Sydney C. McLouth,** a wooden vessel 267 feet long and 40 feet beam, burned and sank on June 27, 1915, about 4¾ miles 175°35′ from Oconto South Pierhead Light. Soundings taken in July 1962 showed a depth of 4 feet over the wreck and 18 feet alongside. The wreck is in two sections and lies close to the edge of the offshore bank between the Oconto and Pensaukee Shoals and out of the course of general navigation, but is an obstruction to fishing craft running out of Oconto Harbor. It is marked by a buoy placed 200 feet east of it.

Caution Area.—The Oconto Rifle Range, a firing area for small caliber weapons, is located 2 miles southeast of the City of Oconto, Wis., on the shore of Green Bay. The firing creates a caution zone approximately one mile wide and extending 1¼ miles lakeward from the shore line. Mariners should navigate the area with caution and consult the Notices to Mariners for latest information.

South of the Oconto River a rocky bank sets out 2¼ miles, with 6 feet or less water on it, and detached therefrom is Oconto Shoal with limiting depth of 11 feet lying 3½ miles offshore; its north end, with 17 feet of water, is 2¾ miles southeasterly from Oconto Pierhead Light, and it extends thence 2¼ miles to the south.

Oconto Harbor, Wis. is at the mouth of the **Oconto River,** on the west shore of Green Bay about 31 miles northerly from Green Bay Harbor. The city of Oconto is about 2 miles up the river. Below Oconto the river traverses a belt of low, swampy ground, the elevation of which is but slightly above the surface of the river. Inside the shore ends of the piers, the banks of the river are generally unprotected by revetments, and bars form in the wide portions of the channel from scour in the narrower parts during severe freshets.

Channels.—A dredged entrance channel leads from deep water in Green Bay between two piers to a turning basin inside the mouth of the river. In March 1978, the controlling depths were 8 feet in the approach channel, thence 4 feet between the piers, and thence 3 feet in the east end of the turning basin and 1½ feet in the west end, where severe shoaling exists.

A dredge bank about 40 feet wide and extending about 400 feet lakeward from shore, divides the westerly section of the turning basin. The northerly side of the turning basin has a channel width of about 100 feet between the dredge bank and the northerly channel line.

Except for shoal spots, the river has a navigable depth of about 4 feet for a distance of about 2 miles. The channel of greatest depth is narrow and meandering; local knowledge is desirable.

Aids to Navigation.—Oconto South Pierhead Light is on the end of the south pier. Oconto North Pierhead Light, mounted 16 feet above the water on a red pole, is on the outer end of the north pierhead. Oconto River Inner Light, 10 feet above water on a black pile, is on the south end of the small projection extending southeast from the north pier.

Bridge.—Park Avenue Highway Bridge, crossing Oconto River 1.99 miles above the mouth, is a fixed bridge with three spans, each having clear width of 56 feet and clear height of 9.9 feet above Low-Water Datum.

From the mouth of the Oconto River, the shore curves northwestward about 2½ miles and then trends northeasterly for about 8½ miles to the mouth of the **Peshtigo River.** The Peshtigo River approach is marked with a buoy located about one mile south of the entrance to the river. In the bay formed within a line connecting the mouth of the two rivers, the water is shallow, with limiting depths of 1 to 12 feet. A shoal with 17 feet least depth lies 6¾ miles 231° from Peshtigo Reef Light.

From **Peshtigo Point** at the mouth of the Peshtigo River, where **Peshtigo Shoal** extends southeasterly a distance of 3 miles, an extensive sand flat makes out for 1¾ miles up to 2 miles below Marinette where the flat extends out about 2 miles. Depths on the shoal area are 1 or 2 feet near Marinette **(Menekaunee Shoal)** and from 5 to 10 feet thence to Peshtigo Shoal, which latter has from 2 to 6 feet of water over it and only 3 feet at its outer end. The easterly side of Menekaunee Shoal is marked by a buoy located 2 miles southeasterly from Menominee Light.

Peshtigo Reef Light is located on the southeasterly end of Peshtigo Shoal; a diaphragm foghorn sounds as required.

Chart 14909.—Green Island is a wooded island situated 4¾ miles southeasterly from Menominee Pierhead Light, and is one mile long northwesterly and southeasterly. It is clear to within ⅛ mile of its southerly face, and to within ¼ mile on its northerly side; but a reef extends west from the westerly end for 1 mile with less than 7

feet existing for ½ mile. and from the southeasterly end a spit extends to the southeast for ½ mile. Green Island Lighthouse has been abandoned. Green Island Light is situated near the southeast point of the island on a skeleton tower.

Due to extensive sand and gravel dredging operations, during which stones and waste were discharged overboard, the area surrounding Green Island has been fouled and should be avoided by deep-draft vessels. The northwest corner of the shoal area westerly from the island is marked by a buoy and the southeast corner of the fouled area is marked by a buoy.

Wreck.—The unmarked wreckage of the wooden steamer Sidney O. Neff lies on the shoal about 1,700 feet southeast of Menominee south pierhead and should be avoided by small craft. In July 1959, the least depth over the wreck was 2 feet.

Charts 14917, 14909.—Menominee Harbor and River, Mich. and Marinette, Wis.—This harbor is located at the mouth of Menominee River, about 16 miles northwesterly from the mouth of Sturgeon Bay, and 49 miles northeasterly from Green Bay Harbor. The river for a distance of 150 miles forms the boundary between Michigan and Wisconsin; it is navigable only to a dam about 2½ miles above the mouth, and this portion is the commercial harbor for Marinette, Wis. and Menominee, Mich. The city of Marinette, Wis., is situated on the south side of the river and the city of Menominee, Mich., on the north side.

Channels.—A dredged entrance channel leads from deep water in Green Bay between parallel piers upstream in Menominee River for about 1.7 miles to about 600 feet below the Dunlap Avenue bridge. A turning basin is on the south side of the channel about 1 mile above the mouth. In 1977, the controlling depths were 23 feet in the approach channel, thence 21 feet at midchannel between the piers upstream to the Ogden Street bridge, thence 21 feet at midchannel to the wharf above the turning basin with 21 feet in the basin except for shoaling along the south edge, thence 19 feet decreasing to 8 feet at the upstream limit of the project.

Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Currents in the river attain velocities up to 3 m.p.h.

Shoals in Harbor Approach.—Outside the pierheads, the improved entrance channel has a depth of 21 feet or more, but is bordered by shoals on both sides. The limits of the entrance channel, about 2,500 feet beyond the Menominee Pierhead Front Light, are marked by a buoy on the northerly side and a buoy on the southerly side.

Menominee Shoal, a small pile of rock and sand, apparently a dump or the wreck of a loaded barge, with a minimum depth of 12¾ feet and 26 feet of water surrounding it, bears northeasterly 0.8 mile from Menominee Pierhead Front Light. It is near the course taken by steamers bound for lower lake ports, and is marked by Menominee Shoal Lighted Horn Buoy 2A. Another spot with 16 feet depth lies about 2,000 feet northeast of the pierhead light.

Aids to Navigation.—Menominee Pierhead Light is on the end of the north pier. Menominee Pierhead Inner Light is located 745 feet southwesterly from the front light. Marinette Pierhead Light is located at the outer end of the south pier.

A breakwater, illuminated by several white post lights spaced along the axis of the structure, is located northwest of the entrance piers. Menominee Inner Breakwater Light (private) is located on the southeasterly end of the breakwater, 4,950 feet 312° from Menominee Pierhead Light.

Harbor Facilities.—A breakwater and pier owned by the city of Menominee, located about 1 mile northwest of the river piers, forms Menominee Marina, a harbor for small craft. The inner mooring facilities have been jointly developed by the city and the Waterways Commission and provide accommodations for recreational craft, with water, electricity, gasoline, a launching ramp, a restroom-shower building, sewage pump-out facilities and harbormaster services available.

Bridge.—A new (1973) double-leaf bascule highway bridge connects First Street, Menominee, with Ogden Street, Marinette, about 0.38 mile above the river mouth. The bridge superstructure has a horizontal clearance of 100 feet normal to the channel through the drawspan and its pier protective pile clusters and a vertical clearance in the closed position of 12 feet above high water and about 18.2 feet above low water.

Potable Water Intakes.—See 42 U.S.C. 264 published in Certain Laws, preceding, and 42 C.F.R. § 72.121 of Rules and Regulations, preceding. A potable water intake pipeline for the city of Marinette, commencing at a point about 2,400 feet 157° from the Inner Breakwater Light, extends 1,900 feet 040° to a submerged crib. It is not marked.

A second potable water intake pipeline for the city of Marinette, commencing at a point 2,330 feet 157° from the Inner Breakwater Light, extends 2,200 feet 039° to a submerged crib with 16 feet of water over it. It is not marked.

A third potable water intake pipeline, commencing at a point 1,325 feet 301° from the Inner Breakwater Light, extends 1,700 feet 058° under the breakwater to a submerged crib with 14 feet of water over it. It is not marked.

Intake Pipelines.—A raw water intake pipeline, commencing about 2,450 feet 156° from the Inner Breakwater Light, extends 350 feet 040° to a submerged crib. It is not marked.

A second raw water intake pipeline, commencing at a point 1,350 feet 304° from the Inner Breakwater Light, extends 700 feet 055° under the breakwater to a submerged crib. It is not marked.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding, and 33 C.F.R. § 117.644 of Rules and Regulations, preceding.

Navigation Regulations.—See 33 C.F.R. § 162.120 of Rules and Regulations, preceding.

Chart 14909.—Above Menominee, the coast has a regular trend to the northeast as far as Cedar River. Good an-

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chorage is found to the northwest of Menominee Pierhead Light, where the shore turns southeasterly to the mouth of the river, with the 18-foot contour about ¼ mile out. Above this anchorage area, shoals vary in offshore extent from 1¼ to ½ miles. This reach from about 3 miles north of Menominee for a width of about 2½ to 3 miles offshore to about the outlet of the Cedar River, a distance of about 19 to 22 miles, is an authorized and regulated Pound Net Fishing Grounds section.

Ingallston and Arthur Bay are small fishing settlements located about 8 miles and 16 miles, respectively, north of Menominee or 16 miles and 8 miles, respectively, south of Cedar River.

Fishing and Hunting Regulations.—See U.S.C. 1, published in Certain Laws, preceding, and 33 CFR § 206.75 of Rules and Regulations, preceding.

Whaleback Shoal lies in the middle of Green Bay about on a line from Porte des Morts Passage to Cedar River. It is 1½ miles long northwest and southeast by ⅝ mile in greatest width, with only 3 feet of water over it about midway of its length. Except in clear weather, great care is necessary in approaching the locality. Whaleback Shoal east end lighted bell buoy marks the southeasterly extremity of the shoal, and a can buoy the northwesterly point.

Cedar River, Mich.—Originally the river mouth was obstructed by a bar on which the depth was 3 feet or less. The mouth of Cedar River is protected by east and west piers. In 1978, the east pier was in ruins and partially submerged. In 1968, the controlling depths were 5 feet in the entrance channel between the piers and 5 feet in the river to the highway bridge.

Aids to Navigation.—Cedar River Pierhead Light is on the west pier near its outer end. Cedar River entrance buoy is located in 24 feet of water 4,800 feet 151° from Cedar River Pierhead Light.

A rock in about 9 feet of water is located about 2,100 feet 165½° from Cedar River Pierhead Light.

Bridge.—About 2,000 feet from the shore end of the harbor piers, a fixed highway bridge spans the river, having a clear width of 166 feet and a clear height of superstructure above Low Water Datum of 10.1 feet. It is not lighted for navigation purposes, being at the head of general navigation.

About 2 miles northeasterly of the mouth of Cedar River, a detached 4-foot rock is found about ⅝ mile northeasterly from the southerly point of the bight. From the point just south of the mouth of Deer Creek, a rocky reef extends 1 mile to the east and southeast, at the outer end of which are boulders with only a foot or two of water on them.

Charts 14908, 14909.—From Deer Creek to the Ford River, a rocky shoal having patches of very scant water extends 2 miles from shore.

Time.—Areas south of Deer Creek observe central standard time or central daylight saving time. Michigan communities northward of Deer Creek observe eastern standard time or eastern daylight saving time.

Section XVI.—Little Bay De Noc and Big Bay De Noc, Mich., the Northerly Extremities of Green Bay

Regional Charts: Chart 14900; Chart 14902; Coast Chart 14908.

Charts 14908, 14915—Little Bay de Noc, Mich.—The main channel in Little Bay de Noc permits the passage of the deeper draft vessels on the lakes. The vessel course in entering, passes between the Escanaba Light at Sand Point on the west side and the buoy marking the outer corner of the shallow offshore bank on the east side, and after proceeding farther northward, the channel to the upper part of the bay opens between Squaw Point Light on the east side and Saunders Point on the west side at Gladstone.

An extensive sand shoal area extends from below the mouth of the **Ford River** out to about 4½ miles from where it extends almost due north to **Sand Point.** Spots along the outer edge of this shoal have depths of 1 to 12 feet. A buoy, about 7 miles from Sand Point, marks the southeasterly edge of the 17-foot contour of this shoal. On this bank, about 2½ miles below Sand Point, is situated **Portage Point,** a narrow ridge about 2 miles long connected with the main shore.

Between Portage Point and Sand Point, a 24-foot shoal spot east of the recommended vessel course, is marked on the westerly edge with a buoy located about 1¼ miles 154½° from Escanaba Light.

Escanaba Harbor, Mich.—This harbor, situated on the west shore of Little Bay de Noc, about 7 miles northeast of the Ford River, and about 7 miles northwesterly of Peninsula Point, consists of an indentation protected on the south by the projection of land terminating in Sand Point and affording safe moorings for vessels.

The portion of the bay constituting the harbor has natural depths of 30 to 40 feet at a distance of approximately 2,000 feet from shore. The natural conditions are such that the largest vessels have free access to the harbor.

Aids to Navigation.—Escanaba Light is located near the northeast corner of the shallow area extending off the north side of Sand Point; a diaphragm air foghorn sounds as required. A buoy 1,800 feet westerly from the light marks the north side of an obstruction lying east of the municipal wharf.

Harbor Facilities.—The following facilities were active in 1978, with alongside depths reported in August 1978. The C. Reiss Coal Co. Dock No. 2 is about 1 mile northwest of Escanaba Light; depths alongside 21 to 24 feet. Chicago and Northwestern Transportation Co. Ore Dock No. 6 is about 1 mile north of Dock No. 2; depths alongside 30 feet. Dock No. 1, about ⅜ mile north of Dock No. 6, is operated by C. Reiss Coal Co. and Amoco Oil Co.; depth alongside 21 feet. Shell Oil Co. Marine Terminal Dock is 1,500 feet northeast of Dock No. 1; depth alongside 20 feet. Wells Terminal Dock, about 1 mile north of Shell Oil Terminal is operated by Holly Terminals, Inc.;

depth alongside 28 feet. Old dock ruins are south of Dock No. 2 and north of Dock No. 6. Sweeping in 1957 disclosed a pile with clear depth of 22.6 feet, 1,440 feet 144° from the end of dock No. 6. The municipal wharf is located on the north side of Sand Point and affords good mooring except during northerly winds.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Escanaba, Mich. is contained in the Port Series No. 48 (Revised 1973) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Municipal Harbor.—A small-boat harbor, primarily for recreational craft, has been developed by the city of Escanaba and the Michigan State Waterways Commission along the bay shore southerly of Sand Point. The completed work consists of an entrance channel, about 9 feet deep and 200 feet wide, protected by parallel piers, leading to a mooring dock and a protected basin having an area of about 30 acres with depths of 1 to 12 feet. A large city-owned marine railway is located in the basin and is available for public use at a nominal cost. The city maintains a light on the outer end of the north pier. Transient berthing, gasoline, diesel fuel, water, electricity, pump-out facility and harbor attendant services are available.

Coast Guard.—A U.S. Coast Guard Aids to Navigation Team is on the northern shore of Sand Point, about 2,000 feet southwest of Escanaba Light. Limited search and rescue operations are available.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A 20-inch potable water intake of the city of Escanaba is located 400 feet southeast of the North Pierhead Light. There is a depth of 35 feet of water over the crib.

A potable water intake pipeline commences at the shoreline about 3¾ miles north of Escanaba Light and extends 3,550 feet 092° to an intake crib in about 38 feet of water. There is a clear depth of 28 feet over the crib and it is not marked.

From Sand Point in Escanaba to Saunders Point in Gladstone, the shore curves from the north into the northeast, with shallow water along it extending out a maximum distance of ⅝ mile.

Gladstone Harbor, Mich., is situated on the western shore of Little Bay de Noc, about 7½ miles north of Escanaba, Mich. The harbor is of natural formation, consisting of an indentation of the bay, protected on the south by the projection of land terminating in Saunders Point. It is completely landlocked and affords safe moorings for vessels at all times. The portion of the bay constituting Gladstone Harbor has generally deep water in the easterly half, extending from a point midway of the shore on the north side of the city up to the Cities Service Oil Co.'s (formerly Theisen-Clemens Co.) dock at Kipling with shoals in the westerly half of the harbor. In places the shoals interfere with the free movement of vessels. The average season for navigation is from April 15 to December 10.

Channels.—A dredged channel leads from the deep water in Little Bay De Noc to a basin off the waterfront at Kipling. In 1977, the controlling depth was 23 feet in the channel and basin.

Aids to Navigation.—Saunders Point Buoy 11 is located 600 feet northeast of the extremity of the point and about 6,700 feet 020° from Squaw Point Lighthouse. A shoal which extends out from the north side of Saunders Point is marked on its northern edge by a buoy. Owing to their respective projections, Saunders Point marked with Saunders Point Light mounted 28 feet above the water on a skeleton tower, is on the west shore of the bay (at Gladstone) directly north of Squaw Point on the east shore and there is a deep channel between the two. This arrangement effects, above Saunders Point, a landlocked anchorage having good depths over mud bottom. Kipling Channel Buoys 8, 9 and 10 mark the dredged 200 foot wide, 24-foot deep channel to the oil terminal at Kipling, Michigan.

Municipal Harbor.—A small-boat harbor, primarily for recreational craft, has been developed by the city of Gladstone and the Michigan State Waterways Commission about 1¼ miles southwesterly from Saunders Point, at the foot of Tenth Street on the south shore of the city. The completed work consists of an entrance channel leading to a lagoon having an area of about 2 acres with depths of 6 to 10 feet. The channel is protected on the south by a pier and a detached breakwater. The depths along the breakwater vary. Reconstruction of the harbor was started in 1949. The east wall of the entrance channel and all piling has been removed and a channel 40 feet wide and about 7 feet deep has been dredged. Additional work contemplated consists of widening the west pier from 10 to 40 feet from the shore to its outer end and construction of a breakwater about 700 feet easterly thereof. The city maintains a flashing green light on the outer end of the breakwater. In 1963, the city and Waterways Commission jointly participated in a project which substantially revised the existing municipal small boat harbor. Water, electricity, gasoline, restrooms and showers are available.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A wooden intake pipe laid by the city of Gladstone extends from the shore near the outer end of Saunders Point, just east of the inner angle on the south side, 1,500 feet southeasterly; its outer end is nearly on a line between Saunders Point buoy and Squaw Point Light. There is a depth of 40 feet over the outer end of the pipeline. It is not marked.

Water Intake.—A steel intake pipe laid by the city of Gladstone extends 550 feet from shore on a line south of the powerplant near the outer end of Saunders Point. There is a 20 foot square intake crib at its outer end with a depth of 29 feet over the highest part. Vessels are cautioned not to anchor in the vicinity of these pipes.

The Whitefish, Rapid, and Tacoosh Rivers, the first used only for logging and the latter two only small creeks, empty into the head of Little Bay de Noc through a common channel which lies between two long points of shoals extending a long distance out from the west shore of the bay at **Masonville,** and from the east shore opposite. This channel is not well defined and is in part, narrow and tortuous. Investigation in September 1965 showed a controlling depth of 3 feet.

The north part of the bay is generally shallow water for about 1 mile. The east side of the bay extending generally into the southwest for about 5 miles to Squaw Point Light is deep water beyond ⅜ mile from shore.

From Squaw Point a flat with spots of 4 to 6 feet at the outer edge extends offshore 2 miles at its southerly limits, gradually increasing from Squaw Point: the southwest corner of this flat is marked by Little Bay de Noc Shoal red lighted buoy about 5 miles southerly from Squaw Point. The bay thence has deeper water to within ½ mile of the shore south to **Stonington.** The coast in the vicinity of Stonington is bluff. The bay is deep-to for a further distance south of 2 miles. Beyond this point the east shore should not be approached within ¾ mile down to **Peninsula Point.** Peninsula Point is the narrow termination of the separating peninsula between Little and Big Bays de Noc. A rocky spit extends 1¼ miles south from Peninsula Point.

Chart 14908.—Minneapolis Shoal light is on a small rocky shoal, 6¼ miles southerly from Peninsula Point, the most southerly point of the northern peninsula extending between Little Bay de Noc and Big Bay de Noc: vessels should give the station a berth of at least ¼ mile. A diaphragm fog horn and a radiobeacon are operated at this station. **Drisco Shoal,** with 9 feet least depth, is located 2⅝ miles southeasterly from Minneapolis Shoal Light, its south end being marked by a buoy. **North Drisco Shoal** is a mound of boulders about 200 feet in diameter, with least depth of 17 feet, situated 1½ miles southeasterly from Minneapolis Shoal Light: there are a number of other spots in the vicinity with 21 to 24 feet depths. These shoals lie close to the track of vessels bound from the Rock Island and Porte des Morts Passages to Little Bay de Noc.

Eleven-Foot Shoal, a detached shoal with 5½ feet least depth, is 2¼ miles southerly from Peninsula Point. A buoy is off the west side of the shoal. Unless perfectly familiar with the locality, vessels should not attempt to pass northward of this 5½-foot shoal, as there are other spots with 13 to 18 feet of water on them, located within ½ mile to the northeastward. **Corona Shoal,** with 12 feet least water, is located about 3 miles southerly from Peninsula Point. Corona Shoal Buoy is moored off a 27-foot spot about 1¼ miles to westward of the shoal, at a point about 4 miles southerly from Peninsula Point.

The area to the south of this region is described previously.

Coming into Big Bay de Noc around Peninsula Point, the coast is low and wooded and trends generally northeast. Between Peninsula Point and **Chippewa Point** the shoals have an offshore extent of from 1 to 1¾ miles.

Round Island lies off this shore 3⅞ miles northeasterly from Chippewa Point and 3⅜ miles southerly from St. Vital Point. It is surrounded by shoals which extend ½ mile southerly and ¾ mile northerly from it. A detached reef with 2 feet least depth is found ¾ mile northwesterly from the north point of Round Island, and extends thence northerly about ¾ mile, its inner edge being about 1½ miles from the adjacent mainland. **Ripley Shoal** lies with its southerly end, having 3 feet of water, 1¼ mile northerly from the north point of Round Island, and is about ½ mile long with only 1 foot depth near its north end.

Ogontz Bay is the name of the northwestern arm of Big Bay de Noc, included between St. Vital Point and Indian Point. Depths in this arm shoal from 18 feet to shore. Shoals from ¾ to 1½ miles in extent continue around St. Vital Point and in the bight south of it. **St. Vital Island** is situated on this bank 1¼ miles northeasterly from St. Vital Point. Depths of less than a foot are found around this island, as well as at spots 1 mile southeasterly from St. Vital Point and ¾ mile southeasterly from the point next south of it.

From the east and west stretch of shore between Stony and Indian Points, a triangular-shaped bank reaches to the southward a distance of 6½ miles, covered with numerous patches of scant depth; its outer end, with depths of 3 to 7 feet, is marked by Big Bay de Noc Shoal buoy.

Nahma, Mich., is a small village on the shore west of Stony Point and at the mouth of Sturgeon River. It contains the mills and docks of the American Playground Device Co. Three dilapidated docks extend about 450 feet into the bay, and eastward therefrom are the ruins of four other docks. There is reported to be about 12 feet depth between the docks, but they should be approached with extreme caution. The water is shoal on the west side of the west dock and on the east side of the east dock. A buoy marks the west side of the approach channel.

Potable Water Intake.—See (42 U.S.C. 264), published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake is located about 200 feet southeast of the docks at Nahma. It is not marked.

From Stony Point, the northeast section of Big Bay de Noc extends northeast about 6½ miles and follows around **Popular Point** to **Porcupine Point** on the west, and around to **Valentine Point** on the east shore, and on down to **Kates Bay,** with depths of 12 to 16 feet. This stretch to the north is generally 14 to 18 feet deep, decreasing to the six-foot contour within ½ to ¾ mile of the shore. Following around **Ansels Point** is **Garden Bay,** the largest indentation on the east coast of Big Bay de Noc, and having available depths of 8 to 12 feet. **Garden Bluff** is the southwesterly point of Garden Bay and deep water is available west of a line from Garden Bluff to **Middle Bluff** with **Snake Island** just to the north of Middle Bluff. Just southwest of Middle Bluff is a

small inlet called Snail Shell Harbor, at the head of which is situated the town of Fayette, Michigan.

The entrance to Snail Shell Harbor is marked by a buoy located approximately 800 feet northwest of the point west of the town of Fayette. This harbor provides excellent protection for recreational craft.

Sand Bay continues to the southwest as far as Burnt Bluff, with shoal water extending out ¼ mile from shore. Burnt Bluff constitutes the east entrance point of Big Bay de Noc. There is a small privately owned man-made harbor with good water just southwesterly of the sheer rock bluff at Burnt Bluff and deep water generally within 1,000 feet of the shore around to the west entrance to Sac Bay.

Fairport, Mich., a small fishing settlement about halfway between Sac Bay and Point Detour, opposite Little Summer Island, has several landing piers with 5 to 6 feet of water at their outer ends. Shoals with 5 feet depth connect the main shore with the Summer Islands; a buoy marks a one foot shoal spot located about 2,000 feet west of Fairport. Otherwise, the shore between Sac Bay and Point Detour has a shoal border from ⅛ to ½ mile wide.

South of Point Detour are the Summer Islands, numerous shoals and passages into Green Bay which have been described previously.

Section XVII.—Point Detour Along the North Shore to Graham Point in Straits of Mackinac

Regional Charts: Chart 14900; Chart 14902; Coast Chart 14908; Coast Chart 14911; Chart 14880; Coast Chart 14881.

Chart 14908.—Between Point Detour at the north entrance to Green Bay and Point aux Barques, a distance of over 18 miles in a general northeast direction, the low coast line is broken by a series of bays and inlets opening to the south and east. At Point Detour shoals make out to the southward about ⅞ mile. A detached shoal with 16 feet depth lies in deep water about 3¼ miles easterly from the first point north of Point Detour. From Point Detour to Portage Bay the coast should be given a berth of 1 mile. Between Portage Bay and Parent Bay the coast is filled by rocks and shoals with very little water on them, the maximum extent being at the northeast point of Portage Bay, where a spit which is nearly exposed in places reaches 2 miles to the southeast. From the northeasterly and southwesterly points of Parent Bay very shallow banks extend over 1 mile to the southeast, and between the two is a width of ⅜ mile of deep water extending northwesterly to within 2,000 feet of the head of the bay. From Parent Bay easterly to Point aux Barques, the coast is a moderate bluff and there is shallow water over rock for a distance offshore of ½ to 1 mile. At Point aux Barques a narrow reef extends 1⅜ miles in a southeasterly direction, having only 9 feet of water on its outer end. From Point aux Barques the low, sandy coast takes a northerly turn to Manistique, a distance of 11½ miles. In this stretch the shoal water reaches ½ to 1 mile offshore as a rule, except at Wiggins Point, 4 miles northerly of Point aux Barques. Here shoals and rocky spots, with prevailing depths of 2 to 13 feet, make out all around the point within a radius of 2 miles. The outer easterly edge of this area is marked by Wiggins Point Shoal buoy, situated about 2¼ miles southeasterly from Wiggins Point.

Vessels approaching the harbor at Manistique should avoid the shoals lying off the point east of the entrance to the river. A rocky shoal, with 18 feet least depth, also exists in the approach to Manistique at a point 4,900 feet 204° from the light on the end of the east breakwater and another shoal with 23 feet over it and more than 33 feet surrounding, is located 3⅛ miles 176° from the light on the end of the east breakwater.

Manistique Harbor, Mich.—This harbor is located at the mouth of Manistique River, distant by water about 66 miles easterly from Escanaba and about 80 miles westerly from St. Ignace.

Channels.—The dredged entrance channel leads northeast from deep water in Lake Michigan between converging breakwaters through an outer basin. From the outer basin, the mouth of the Manistique River is entered between two piers. In 1976, the controlling depths were 19 feet in the approach channel except for shoaling along the west edge, thence 15 feet through the outer basin and through the mouth of the river to a point about 1,200 feet above the outer ends of the piers.

The channel and basin are not adapted for anchorage, and mooring to the breakwaters and piers is prohibited.

The current in the channel attains velocities up to 3 m.p.h.

Above the dredged channel, there are a number of abandoned wharves with channels between having depths of about 7 feet.

Areas of bare ledge rock with from 8 to 17 feet of water over them extend about 2,000 feet to the southward from the east breakwater and approximately 1,500 feet southwesterly from the end of the west breakwater.

Aids to Navigation.—The harbor entrance is marked on its east side by Manistique Light on the end of the east breakwater; a diaphragm foghorn is operated at this harbor. The west side of the entrance is marked by a light on the outer end of the west breakwater. The outer end of the west pierhead at the river mouth is also marked by a light.

Harbor Facilities.—A mooring facility was developed in 1974 by the city of Manistique and the Michigan State Waterways Commission in the city on the Manistique River approximately 0.4 mile from the pierhead lights. The accommodation consists of moorage for 24 small craft up to 60 feet in length and offers water, electricity, lights, gasoline and oil, restrooms, showers, sewage pump-out facilities and harbor attendant services.

From Manistique to Farnsworth Point the bottom is

generally shallow and rocky for a distance offshore of from ⅜ to 1 mile. In the vicinity of Farnsworth Point, there is a shoal area with a rocky bank extending 1¼ miles from shore. Beyond this offshore bank, an area of foul water, consisting of rocky mounds surrounded by 40 to 50 feet of depth, reaches to a distance of 3 miles southward from Farnsworth Point; the shoalest outlying spots being one with 16 feet depth lying 1⅞ miles southeasterly from the point, and one with 19 feet depth lying 2½ miles southerly from the point.

Chart 14911.—This shoal in the vicinity of Farnsworth Point, decreases in size and extent about 1½ miles east of Farnsworth Point, and there is generally deep water to within ⅜ mile of shore for a distance of over 9 miles in a southeasterly direction to Seul Choix Point.

Seul Choix Point Light, on the outer end of **Seul Choix Point,** is shown 80 feet above the water from a white conical tower connected to a red dwelling.

Between Seul Choix Point and **Hughes Point,** a distance of about 5¾ miles, the curve of the shore forms a bay protected from the north and west, having a good depth over sand bottom to within ¾ mile of shore. About ¾ mile south of Hughes Point a detached shoal extends ½ mile east and west, with depths of 9 and 13 feet at its east and west ends, respectively.

Port Inland, Mich. is a private harbor of the Inland Lime & Stone Co., built in the lake in front of the company's plant located about 4 miles northeasterly of Seul Choix Point and 18 miles easterly of Manistique.

The 900-foot-long loading dock on the west side of the harbor basin is protected by a breakwater which extends south and west from the shore east of the dock. The dredged entrance channel has depths of about 25 feet.

Aids to Navigation.—The company maintains a light on the outer end of the breakwater, and an air fog horn sounds as required. A foghorn is located at the lighthouse. A buoy is located in deep water 4 miles south of the light.

The company maintains two lighted ranges with orange background. The outer range front light is on the shore 2,375 feet 348° from the breakwater light; the rear light is 800 feet 000° from the front light; a Coast Guard marker radiobeacon is located at 90 feet 000° from the front light. The inner range front light is on the inner end of the breakwater, 2,750 feet 041° from the breakwater light; the rear light is 625 feet 047° from the front light.

From Hughes Point, the coast trends easterly about 9 miles around a slight recession to **Scott Point and on to Point Patterson. This shore is generally filled with shoals** and rocks within a distance from ¾ to 1 mile; a spot with but 15 feet depth is found 5,000 feet south of Scott Point.

Coming around Point Patterson, the coast continues into the northeast and around a small bay into the **southeast to Millecoquins Point.** The lake area up to the bay west of Millecoquins Point is filled by an extensive flat which, at about the middle of this stretch, extends out a distance of 2¾ miles within the 18-foot contour, receding shoreward on either side of this maximum reach, and having an extent of about ½ mile easterly from Point Patterson. Above this shoal and through the bay, there is deep water to within ½ mile or less of the shore, except for a small rocky spot with 11 feet on it, lying 1½ miles northwesterly from the north end of Naubinway Island and ⅞ mile offshore. Submerged net stakes fill this area within about 4 miles of the shore.

Naubinway Island, about ⅝ mile south of Millecoquins Point, is a small island surrounded with rocks and shoal water, the latter extending in an easterly direction from the island a distance of ¾ mile, with spots of 1 to 7 feet depth near the outer end is marked by Naubinway Island Light. **Naubinway Reef,** a rocky shoal with 4 feet least water, lies 1⅜ miles southeasterly from the island, and about halfway between the two is a 14-foot spot with deep water surrounding. Another detached 14-foot spot lies ¾ mile southwest of Naubinway Island.

Potter and Millecoquins Reefs.—Potter Reef, with 1 foot depth and marked by a buoy on its northeasterly point, lies off the outer extremity of the flat and 6½ miles northeasterly from Point Patterson. The northwestern part of Millecoquins Reefs, with a buoy on its western extreme, consists of detached spots with 7 and 10 feet least depths, extending over 1 mile east and west, located about 5 miles southerly from Millecoquins Point and 2½ miles northeasterly from Potter Reef. The southeastern part of Millecoquins Reefs, with 7 feet least depth, is about 1 mile southeast of the above reef and 3¾ miles easterly from Potter Reef. A boulder shoal with depth of 9 feet lies 1¼ miles southeasterly and two detached 12-foot spots bear southwesterly about 2 miles and 3 miles, respectively, from the southeast part of Millecoquins Reefs. These reefs and shoals are out of the regular path of vessels and are unmarked.

Descriptions relative to the Simmons Reef, Fagan Reef, Lansing Shoals, and other shoals lying farther south in the vicinity of the Beaver Island Group, are given previously.

Between Millecoquins and **Biddle Points** is a small bay having general depths of 12 feet and over, and shallower water lying within a distance of ⅜ mile of shore. Just at the west part of this small bay is the town of Naubinway.

Naubinway, Mich.—The lumber dock at Naubinway, on Millecoquins Point, has been washed out except for a few piles. There is good shelter for boats up to 10 feet draft behind the first point northeast of Millecoquins Point, but the approach is rendered dangerous by very shallow reefs and boulder shoals lying within a distance of ¾ mile easterly from the shore at Millecoquins Point and Naubinway.

Harbor Facilities.—Construction of a smallboat harbor by the Michigan State Waterways Commission and other agencies was completed in 1968. The harbor consists of a sheet steel breakwater 208 feet long running from southwest to northeast perpendicular to shore and inclosing boat wells, providing water, electricity, gasoline, lights, restrooms, sewage pumpout facilities, showers, a launching ramp, parking area and harbor master services.

Between Biddle Point and Point Epoufette the shore is irregular and much broken, and the outlying waters contain many shoals and rocks with 18 feet or less water

on them, reaching out a distance of over 3 miles in the bight east of Biddle Point and decreasing to 1 mile just west of Point Epoufette.

Pelkie Reef lies with its northerly end 2½ miles southwesterly from Point Epoufette, having 11 feet depth at this end, from which it extends southwesterly about ¾ mile; the least depth on the reef is 1 foot. A detached shoal about 2,000 feet long north and south and 1,000 feet wide on the 18-foot contour, rising abruptly from about 35 feet of water lies 1½ miles southwesterly from Pelkie Reef. The shoal is covered with cobble stones and small boulders, and near the center there is an area about 600 feet in diameter with from 10 to 12 feet of water generally, and a least depth of about 6 feet on one boulder. From the center of the shoal Biddle Point bears northwesterly and Point Epoufette bears northeasterly. About 1½ miles west of this shoal there is a spot with 14 feet depth.

Charts 14911, 14880.—Proceeding along shore from Point Epoufette there are numerous shoal patches with less than 20 feet depth over them, lying from ¼ mile to 1¾ miles from shore. The inlet east of Point Epoufette has an available depth of 7 feet, but is shallow and rocky for ½ mile offshore; at its head is the town of Epoufette. A boulder reef about 2,500 feet long and 1,000 feet wide, with prevailing depths of 24 feet, extending northwesterly and southeasterly, lies 1½ miles southwest of the mouth of Brevoort River; on this reef, a boulder with 16½ feet of water over it, 1¼ miles offshore, bears northwesterly 6 miles from the northwesterly point of St. Helena Island, and a boulder with 17½ feet depth is found ¼ mile farther on the same bearing and 1⅜ miles offshore.

A private harbor has been constructed about 5 miles east of Point Epoufette. A rubble mound breakwater 4,000 feet long, completed in September 1969 forms the easterly end of the harbor.

A boulder reef with spots under 20 feet in depth extends about 2 miles westerly from Point aux Chenes; on this reef a boulder with 15 feet, 1 mile offshore, is 5 miles northwesterly of St. Helena Island, and another boulder with 15 feet, 1⅛ miles offshore, is 4⅞ miles northwesterly from the northwesterly point of St. Helena Island.

A shoal of ledge rock, about 400 feet in diameter on the 21-foot contour, least depth 17 feet, lies 2¼ miles southerly of Point aux Chenes and 2½ miles northwesterly from St. Helena Island.

Manitou Paymen Shoal.—About 3¾ miles offshore at a point about halfway between Point Epoufette and Point aux Chenes is Manitou Paymen Shoal, with least depth of about 1 foot and an extent of about 1 mile both north and south and east and west; a buoy marks the southerly edge of the shoal. A boulder about 10 feet in diameter and with least depth of 18 feet, lies in 30 feet of water ⅞ mile southeasterly from Manitou Paymen Shoal buoy; in its exposed position the boulder forms a menace to navigation.

Charts 14880, 14881.—St. Helena Shoal lies with its narrow eastern extremity about 1¼ miles west of the northwest end of St. Helena Island, and thence it reaches westward nearly 1¼ miles, being about ½ mile in greatest extent north and south, with depth of 4 to 20 feet over rock and deep water around it; its southerly edge is marked by a red and black nun buoy. Do not attempt to round the northwestern end of St. Helena Island at night unless its appearance under Gros Cap and the position of the St. Helena Shoal are well understood.

St. Helena Island is situated 1¾ miles southwesterly off the bluff shore at Gros Cap, and is 1 mile long northwest and southeast by about ⅝ mile in greatest width. On the southeast end is St. Helena Lighthouse, which serves as a guide to vessels making a lee under the island and also as a leading mark to vessels bound northwestward through the South Channel of the Straits of Mackinac. From the light, a very shoal bank makes out about ½ mile to the southeast, its outer end being marked by a buoy. In approaching from the westward this end of the island should be given a wide berth.

Between Point aux Chenes and Gros Cap the shore is deeply and irregularly indented by inlets containing rocky shoals of scant depth, lying within a line joining the two headlands. Southeast of Gros Cap is West Moran Bay which opens to the south and west and affords protection to small craft from north to east winds. On the west of the bay, the bluff shore curving northerly around Gros Cap is deep-to while the section into the southeast to Point La Barbe has a shore which is shoal from ¾ to 1 mile offshore.

Submarine Pipelines.—Two 20-inch submarine pipelines, carrying petroleum products across the Straits of Mackinac between Point La Barbe on the north shore to McGulpin Point on the south shore, are located 1,300 feet apart on the natural lake bottom at midpoint, and are buried 15 feet below the existing lake bottom shoreward of the 65-foot depth contour.

Two 24-inch submarine pipelines, carrying natural gas across the Straits of Mackinac between Point La Barbe on the north shore and McGulpin Point on the south shore, are located easterly of the aforementioned 20-inch pipelines. They are placed 970 feet apart on the natural lake bottom in depths exceeding 50 feet, are buried a minimum of 8 feet below lake bottom between the 50-foot and 10-foot contours, and a minimum of 5 feet below lake bottom from the 10-foot contour to shore.

Submarine Cables.—Two submerged cables cross the Straits of Mackinac between Point La Barbe on the north shore and McGulpin Point on the south shore in the same general area as the submerged pipelines.

Straits of Mackinac Bridge.—The bridge extends across the straits from St. Ignace, Mich. to Mackinaw City, Mich., and is composed of three high-level suspension spans and two series of fixed spans which are connected to the south shore in Mackinaw City and a causeway on the north shore that forms a part of the northern approach to the Straits of Mackinac Bridge. Constructed by the State of Michigan in a southerly direction from the south side of Graham Point about 1 mile west of its extremity, it extends about 4,000 feet from shore to the 12-foot contour.

The center suspension span of the bridge is 3,800 feet wide with a vertical clearance of 148 feet at center de-

creasing to 135 feet at each end. The north and south suspension spans are each 1,800 feet in width having maximum vertical clearances of 131 feet decreasing to 86 feet at the shore ends. Between each of these spans and the adjacent cable anchor pier, there is a fixed span having an opening of 472 feet with a decreasing vertical clearance of 86 feet to 50 feet at the anchors. The south approach is composed of 16 fixed spans with openings between piers varying in width from 560 feet to 160 feet and having varying vertical clearances of 81 feet to 20 feet. The north approach is composed of 12 fixed spans and a causeway approximately 3,780 feet projecting from shore. The openings between piers of the north approach vary in width from 393 feet to 160 feet and have varying vertical clearances of 79 feet to 20 feet.

The approaches to the center span of the bridge are marked with buoys. A diaphragm foghorn is located under the main span on the channel line. The fog signal on the bridge is a private aid to navigation maintained by the Mackinac Bridge Authority.

The currents in the Straits of Mackinac, particularly in the vicinity of the Graham Shoals, which lies southerly of Graham Point, are often strong and irregular, and after fresh gales vessels anchored in the Straits frequently trend to windward.

The water areas and coasts of the Straits of Mackinac to the east of the Straits of Mackinac Bridge are described in sequence in the appropriate descriptive data under the general heading of Lake Huron.

12. ST. MARYS RIVER

Depths and vertical clearances under aerial crossings and bridges herein given for upper St. Marys River above the locks are referred to the sloping river surface when Lake Superior is at Low Water Datum, elevation 600.0 feet, and the gage above the U.S. locks reads 599.5 feet. For the lower St. Marys River, depths and clearances are referred to the sloping river surface when the gage below the U.S. locks reads 577.8 feet and Lake Huron is at Low Water Datum, elevation 576.8 feet. These elevations are above mean water level at Pointe-au-Pere (Father Point), Quebec, on International Great Lakes Datum (1955).

GENERAL DESCRIPTION

The St. Marys River forms the outlet of Lake Superior, connecting it with **Lake Huron**. From **Whitefish Bay**, at Point Iroquois and Gros Cap, the river flows in a general southeast direction to Lake Huron at Point De Tour, a distance of from 63 to 75 miles, according to the route traversed.

The river is bounded on its westerly side for its entire length by the mainland of Michigan's Upper Peninsula; along the lower portion of its easterly side by Drummond Island, Michigan and **St. Joseph Island, Ontario**; and along the upper portion of its easterly side by the Ontario Mainland.

The lower end of the river, De Tour Passage, extends northerly from Lake Huron. The mainland coast of the passage extends from Point De Tour on the south to Gaffney Point, 4 miles north, while the Drummond Island coast is from **Barbed Point** on the south to **Black Rock Point**, 3 miles north.

After passing through the narrows of De Tour Passage, the river widens and turns to the northwest. Between Drummond and St. Joseph Islands, a reach of about 5 miles, it extends across the mouth of Potagannissing Bay. The coastline along St. Joseph Island, from **Old Fort St. Joe Point** to Stribling Point, is 19 miles long.

Lime Island, about 2½ miles long, lies about a mile west of Old Fort St. Joe Point. About a mile north of Lime Island is a narrows between Point aux Frenes on the mainland and **Hay Point**. From this narrows to the foot of **Neebish Island**, about 8 miles to the northwest, the river is wider and called **Munuscong Lake** (formerly Mud Lake). Neebish Island, about 8 miles long and 4 miles wide, lies opposite the northerly portion of St. Joseph Island and divides the river into two narrow channels. Above St. Joseph Island the river is confined between mainland shores. **Sugar Island**, just north of Neebish Island, has a length of about 15 miles and a maximum width near its north end of about 8 miles; Lake George is to the east and **Lake Nicolet** (formerly Hay Lake) to the west of the island. A narrow channel extends from the north end of Lake George around the northerly end of Sugar Island and joins a channel leading northwest from Lake Nicolet off the westerly tip of the island. From this junction, the river extends westerly for about 2 miles between the cities of Sault Ste. Marie in Michigan and in Ontario, to the St. Marys Falls and the Locks. Above the locks the trend of the river is southwesterly for about 5 miles to the narrows between Point aux Pins on the northwest and Brush Point on the Southeast. The river then turns westerly for about 3 miles, passing north of Cedar Point and Round Island before swinging to the northwest around Pointe aux Chenes, widening to 3½ miles and extending about 5 miles to its nominal head between Point Iroquois on the southwest and Gros Cap on the northeast. Waiska Bay is on the southwest side of the turn, opposite Pointe aux Chenes.

Anchoring of Vessels.—Cautionary Notice.—When coming to anchor vessels masters are cautioned not to foul submarine cables. Fouling cables may not only result in disrupting utility services to adjacent communities but also expose the mariner to the danger of high voltages carried by certain cables. Mariners are advised to slip the anchor rather than cut the cable if the normal practice of good seamanship fails to clear the fouled anchor. Lost gear or damaged cables should be reported to the authority having jurisdiction over the waterway.

Charts.—The National Ocean Survey publishes three charts, Nos. 14882, 14883, and 14884 that show the navigable conditions of the waterway, the location of all aids to navigation, and details of shore topography from the De Tour Passage entrance at the head of Lake Huron to Point Iroquois, Mich., and Gros Cap, Ontario, at the extreme easterly end of Lake Superior.

Note.—The depths given in this chapter for the improved dredged channels in the St. Marys River are the

Federal project depths. The Corps of Engineers makes periodic bar sweeps through all the improved dredged reaches of the St. Marys River, and these channels are well maintained at the project depths. Any depths found to be less than the project depths are published in the Local Notice to Mariners.

Improvement Work.—The existing improvement by the United States was carried out under a project providing for a minimum width of 300 feet for one-way traffic and of 600 feet for two-way traffic throughout the river, by dredging shoals from the mouth of the river to Munuscong Lake; excavating two separate channels between Munuscong Lake and Lake Nicolet, one on each side of Neebish Island; dredging through Lake Nicolet; dredging through the shoals between the upper entrance to Lake Nicolet and the canals, including extension of the anchorage and maneuver area below the locks; constructing compensating works; deepening and widening the tailrace of the power plant; constructing two canals, four locks and an emergency dam for each lock; deepening the approach channels and reconstructing the approach piers; widening the channel across Brush Point Turn and Point Iroquois Shoals; and by dredging through four shoals between the head of the falls and Lake Superior.

Navigation Routes—Dimensions of Channels.—Reaches between turns along the main navigation routes through the river have been designated as courses and channels and named or numbered to permit ready identification. These designations are shown on the navigation charts of the river and some of the courses and channels are described in the following text.

Limiting Dimensions of Through Channel

Location	Length	Limiting width	Limiting depth
	Feet	*Feet*	*Feet*
In MacArthur Lock	800	80	*31.0
In Poe Lock	1,200	110	*32.0
In Davis and Sabin Locks	1,350	80	23.1
In Canadian Lock	900	59	16.8
In improved river channels:			
Upbound	--------	--------	--------
Westerly side	--------	300	27.0
Easterly side	--------	200	21.0
Downbound	--------	300	27.0

*Governing depth in South Canal approaches to lock is 27½ feet.

From Point Iroquois to the canals, a distance of 14 miles, there are six vessel courses, and the channel has a least width of 1,200 feet, with a least depth of 28 feet. Navigation around the rapids at Sault Ste. Marie is provided for by canals and locks (with limiting dimensions as shown in the table above) on both the United States side and the Canadian side. Between the lower approaches of the canals and the upper end of the Little Rapids Cut into Lake Nicolet, the Bayfield Channel has a depth of 28 feet over a width varying from 1,500 to 1,890 feet.

At the head of Sugar Island, about 2 miles below the canal locks, the channel divides. One route (for small craft) passes to the north and east of Sugar Island, through Lake George and East Neebish, with limiting width of about 150 feet and depth of 12 feet. The main vessel route passes to the west of Sugar Island, through Lake Nicolet, with least width of 600 feet and least depth of 27 feet. Between Lake Nicolet and Munuscong Lake two channels are provided, passing on each side of Neebish Island. The West Neebish Channel, for the use of downbound traffic, passes west of the island, with least width of 300 feet and least depth of 27½ feet. Sailing courses in this route are numbered 4 through 8 inclusive. The Middle Neebish Channel, for upbound traffic, leads from the head of Munuscong Lake to the east and north of Neebish Island, and has a least width of 500 feet, the westerly 300 feet has a least depth of 27 feet and the easterly 200 feet a depth of 21 feet. Sailing courses in this route are numbered 5 through 10 inclusive. The East Neebish Channel of the Lake George route for small craft connects with this upbound channel at the head of Course 7. On the vessel courses in Munuscong Lake and the lower river the depth is 28 feet or more for a least width of 1,000 feet upbound, and 860 feet downbound.

The various river channels are treated in more extended detail under the head of "Local Descriptions", below.

The distance from Point De Tour to Point Iroquois by the Lake Nicolet route is 63 miles and by the Lake George route 75 miles. The Lake Nicolet route, being comparatively straight in its reaches, can be navigated with reasonable safety at night, but this is not the case with the crooked Lake George route. The Lake George route is marked by buoys and day mid-channel ranges (some obscured by trees) and a few lighted aids, and the Lake Nicolet route is well defined by numerous lights and buoys, the details of which are given in the List of Lights and Other Marine Aids, Great Lakes, published by the U.S. Coast Guard.

There is another important channel, known as the St. Joseph Channel, with least depth of about 12 feet, which leaves the Lake George Channel near its connection with the Middle Neebish Channel, at the south end of Sugar Island, and passing to the northward and eastward of St. Joseph Island leads into North Channel, and thence to Georgian Bay by way of Clapperton Main Passage and Little Current, or directly into Lake Huron through channels on the east and west sides of Cockburn Island, called, respectively, Mississagi Strait and False Detour Channel. These channels are all in Canadian waters and are briefly described in Section VII—Localities in Georgian Bay and North Channel Area, Ont. under the Lake Huron heading.

Fluctuations of Water Level.—Each year the St. Marys River rises and falls about one foot as measured by the monthly mean levels. Since 1900 the difference

between the highest and the lowest monthly mean levels above the locks has been about 4 feet and below the locks about 5 feet. From day to day the level fluctuates somewhat, due to wind and barometric pressure, such changes frequently amounting to several inches and sometimes to a foot or more. In addition to these changes in level, occasionally a considerable oscillation takes places within two or three hours, resulting from variations in barometric pressure; such changes amounting to over 5 feet have been known to occur within three hours. As much of the present sailing route in the St. Marys River has been made navigable by dredging, the changes in level have a direct effect on the available depth.

Rules and Regulations Relating to Anchorage, Navigation and Security in the St. Marys River.—See 33 U.S.C. 474 published in Certain Laws, preceding, and 33 CFR § 92, 33 CFR § 207.440 and 33 CFR § 207.441 published in Rules and Regulations, preceding.

In United States waters of the St. Marys River between Point De Tour and Point Iroquois, except the waters of the St. Marys Falls Canal which are under the direction of the District Engineer or his local representative, the Captain of the Port, U.S. Coast Guard, stationed at Sault Ste. Marie, Mich., has control over movement of vessels and anchorage in St. Marys River except during an emergency when the District Engineer, U.S. Army Engineer District, Detroit, may declare any channel closed, (see § 92.07 of Rules and Regulations, preceding.) General information, caution warnings, and specific orders relating to sequence in which vessels may approach the canal during congested periods are conveyed by the Coast Guard from its local base.

Captain of the Port Area.—See 33 C.F.R. § 3.45-95 of Rules and Regulations, preceding.

Pilotage Regulations. See 46 U.S.C. 216-216i published in Certain Laws, preceding, and 46 C.F.R. § 401 (in part) of Rules and Regulations, preceding.

Pilot Dispatch Offices.—The Lakes Huron, Michigan, and Superior, and St. Marys River, in Great Lakes Pilotage District No. 3 are serviced by the following dispatch offices:

Lakes Pilots Association
P.O. Box 902
Port Huron, Michigan
313-984-2541
Upper Great Lakes Pilots, Inc.
802 Garfield Avenue
Duluth, Minnesota 55802
218-722-1425
Upper Great Lakes Pilots, Inc.
De Tour, Michigan
906-297-5111
Upper Great Lakes Pilots, Inc.
Chicago, Illinois
312-734-6311
Upper Great Lakes Pilots, Inc.
Milwaukee, Wisconsin
414-383-5546

For vessels requiring pilotage service, the nearest pilot dispatch office is notified 12 hours ahead with a follow-up confirmation 4 hours in advance.

Notes on the Current in St. Marys River

1. As the speeds referred to in the foregoing rules (92.49 and 92.55) apply to the speeds over the bottom, and as the currents in the river are variable, masters are cautioned to regulate the speed of their vessels by running on time from point to point instead of relying on the number of revolutions per minute of the propeller (see Schedule of Distances and Times, below).

2. The swiftest currents in the navigable channels of the St. Marys River are found at the Middle Neebish dike, the West Neebish rock cut, and the Little Rapids cut. The strength of the current depends largely upon the discharge of the river and the elevation of the water surface at the mouth of the river. The discharge of the river is now under control and is varied according to water-level requirements. When the water surface at the upper end of Lake Huron is high, because of easterly or southerly winds or because of barometric variations, the current velocity is temporarily checked. When the stage on Lake Superior is such that a large flow is being permitted, the current is strong and is further increased if the level of Lake Huron is low.

3. The attention of masters is also directed to the fact that at times the current over the Rapids at Sault Ste. Marie is slight, while a very strong set is often experienced when passing the inlets of both the Michigan and Ontario power canals. This is especially true of the Ontario canal where vessel masters have encountered difficulty through attaching too much importance to the Rapids current and not enough to that of the power canal.

4. The following limits of velocity may be expected:

Location	Velocity in miles per hour		
	Usual	Probable low	Probable high
West Neebish rock cut	2	1¼	3½
Middle Neebish (course 6)	1½	1	3
Little Rapids cut	1½	1	3
Michigan power canal	2½	2	3
Ontario power canal	2	1	3

5. It is well to note that east and south winds make high water below the locks and low water above the locks and that west and north winds have the opposite effect.

Local Descriptions From Mouth to Head of River

Chart 14882.—De Tour Passage, Mich.—This passage forms the mouth or southern end of the St. Marys River and has an available width of over 2,500 feet of very deep

water. It extends northerly from the entrance in Lake Huron, between the most easterly section of the Upper Peninsula of Michigan on the west and the most westerly section of Drummond Island, Michigan on the east. The shoals on either side at the entrance from Lake Huron and through the passage are suitably marked.

De Tour Reef, a rocky shoal with depth of 15 feet, lies about 3,500 feet southeasterly from **Point De Tour**, the most southeasterly point of the Upper Peninsula. De Tour Reef Light, 74 feet above the water on a white square tower, and showing flashing white, with a red sector covering shoals to the west and north, is located at the southeast side of this reef and marks the west side of the entrance to the passage; a radiobeacon and a fog signal are at the light. The point of departure for vessels entering or leaving the St. Marys River is ¾ mile 128° from the light.

De Tour Shoal, a boulder shoal extending about 1,900 feet easterly from the shore about ½ mile north of the extremity of Point De Tour, is marked at its outer edge by a buoy, which indicates the western edge of the deep channel opposite Crab Island Shoal buoy.

Crab Island Shoal on which there are a number of boulders, one nearly exposed, lies about 1,500 feet to southward of Crab Island, which is off Barbed Point on the east side of the entrance to De Tour Passage. Its west edge is marked by a buoy. The passage abreast of the shoal has been improved to a depth of 30 feet for a distance of about 1,200 feet east of the sailing course.

The westerly side of the passage for 2½ miles from Point De Tour to the waterfront of De Tour Village is very irregular. **Frying Pan Island** lies about 700 feet offshore near the northerly end of this reach. An abandoned fueling dock, along which there is a depth of about 21 feet, is located on the southeast tip of Frying Pan Island. Frying Pan Island Light, mounted 20 feet above water on a white skeleton steel tower marks the upper end of the coal dock.

Frying Pan Shoal, consisting of boulders and with a least depth of 18 feet, is located about 2,000 feet south of Frying Pan Island; it is not marked, being well to westward of the vessel course.

Submarine cable.—Downstream from Frying Pan Island, a submerged cable crosses the river from the mainland, passing 900 feet south of Frying Pan Island in a southeasterly direction to a small island off the Drummond Island shore.

Easterly of Frying Pan Island, on the west shore of Drummond Island between Barbed Point and Black Rock Point, a dock 800 feet long constructed along shore partially on the hull of the Steamer **Oglesby** is maintained by Drummond Dolomite, Inc. Depths of 23 feet were reported alongside in August 1978. Shoal water north and south of the dock is marked by buoys. The village of De Tour, a small community located on the west side of De Tour Passage, is a terminus for the westerly end of the North Channel which connects St. Marys River with Georgian Bay and can be reached through Potagannissing Bay. The mainland of the Upper Peninsula of Michigan affords protection at this locality from southwest through west to northwest winds. There are landing piers for the use of small craft. However, care must be taken to avoid submerged cribs & dock ruins. Ferries operate between a dock at De Tour Village and a dock on the west end of Drummond Island about 1,000 feet north of the Drummond Dolomite dock.

Submarine Cables.—A cable crossing area 1,600 feet wide extends across the river from the village of De Tour to Drummond Island. Southerly limit of the area is a line which passes from the mainland about 400 feet north of Frying Pan Island to a point on Drummond Island about 400 feet north of the Drummond Dolomite dock.

Watson Reefs, a narrow shoal about ½ mile long, lies about ¼ mile off shore between De Tour Village and Gaffney Point. Watson Reefs Light, 25 feet above the water on a black tripod tower, is located near the center of the reef. **Pipe Island**, roughly ¼ mile square, lies about ½ mile northeast of Gaffney Point. **Pipe Island Twins**, a pair of small islands, lie ½ mile north and ½ mile northeast, and **Pipe Island Shoal** with a least depth of 11 feet lies ½ mile southeast of Pipe Island. Although much of the area surrounding and between the islands and shoal is relatively shallow, there is a deep water passage about 1,000 feet wide on the mainland side of the area, about a mile wide on the side toward Drummond Island and over ½ mile to the north toward Squaw Island which is almost a mile northwest of the westerly twin. **Sweets Point** is about 2 miles northwest of Gaffney Point and the outer end of a shoal area extending north of the point is marked by Sweets Point Light. The light is about 1½ miles south of Old Fort St. Joe Point at the south end of St. Joseph Island.

Submarine Cable.—A submarine power cable extends northeasterly on a curve in not less than 35 feet of water across the river bed from Gaffney Point to a point at the southwesterly edge of Pipe Island.

About 1 mile above Pipe Island the routes for upbound and downbound traffic are divided.

The upbound route follows a northerly course through De Tour Passage and beyond passing to the east of Pipe Island Shoal buoy; when abreast of Pipe Island Twins Light the course turns to the northwest into Lime Island Channel, passing to the south of **Squaw Island** and coming adjacent to the downbound course when north of Sweets Point. The Lime Island Channel extends from Pipe Island Twins Light about 6⅝ miles to the turn between **Raber Point** and Lime Island into the **Round Island Course.**

The first portion of the downbound course from Sweets Point is named the Pipe Island Course and extends southeasterly, passing southwest between Gaffney Point and Pipe Island. It then turns southerly into De Tour Passage along the Watson Reefs Course with Watson Reefs Light and Frying Pan Island Light on the starboard hand.

These courses are in deep water except for a least depth of 29 feet in mid-channel on the Pipe Island Course due west of Pipe Island Light.

Gaffney Point, Mich.—The Detour Dock Co.'s coaling station is located on the mainland ½ mile westerly of Gaffney Point. There is an available depth of 26 feet along the lower 700 feet of the face of the 1,000 foot long dock, with a passage about 400 feet wide between the

dock and a shoal having a least depth of 22 feet which lies to the northeast.

Raber, Mich., is on the shore of Raber Bay, to the northwest of Raber Point and to the southwestward of Point aux Frenes.

Lime Island, Mich.—A coaling station of the Lake Coal Div., Consolidation Coal Co., is located here, and has a dock 800 feet long, with a least depth of 25 feet along the lower 500 feet and a shoal area having a least depth of 17 feet off the upper end.

At the turn from Lime Island Channel into the Round Island Course, a buoy separates the two-way traffic. The Round Island Course extends northerly about 3¾ miles to the **Point aux Frenes Turn** at the foot of Munuscong Lake. The Point aux Frenes Turn is a reach of about one mile extending northwest to Lower Course 8 which extends northwest across Munuscong Lake to the junction of the West and Middle Neebish Channels. The improved channel from the head of Lime Island, northerly past Round Island Light and continuing for about 2 miles above Point aux Frenes has a least width of 1,000 feet and least depth of 28 feet. Extensive dumping ground areas and shoals exist along both sides of the Round Island Course, through the Point aux Frenes Turn and into Lower Course 8. The channelward edges of these dumping grounds are at least 500 feet back from either edge of the channel.

The Point aux Frenes Passing Range Lights mark the course changes into and out of the Turn. The ranges are lighted only before and after the navigation season when channel buoys are not in place. The front light structures are well off the channel in shoal water and provided with protective rip-rap extending horizontally out from the structure about 5 feet.

Coming out of the turn above Point aux Frenes, Mich., the course follows through Lower Course 8, marked at the lower end on St. Joseph Island, Ontario, by Hay Point range located southeast of Point aux Frenes and continues on to the junction of the Middle Neebish Upbound Channel Course 10 and the West Neebish Downbound Channel Course 8. This intersection is marked with a buoy.

Chart 14883—Middle Neebish (Upbound) Channel.—The channel is 19.4 miles in length between its junctions with the West Neebish Channel in Munuscong Lake at the lower end and Lake Nicolet at the upper end. It is divided by turns into six courses which, proceeding upstream, are numbered 10 through 5. The channel has a least width of 500 feet, and least depth of 21 feet. The westerly side of the channel for a least width of 300 feet has a least depth of 27 feet. All six courses of the channel are marked by ranges, side lights and buoys, some of which are identified in the following text. The many areas marked on Chart 14883 as dumping grounds and located along the courses have been used for the deposit of dredged material forming small islands and shoals. These areas must be avoided. At the turn between Courses 7 and 6, a passage leads to the northeast between St. Joseph and Sugar Islands.

Course 10.—This course, located at the downstream end of the Middle Neebish Channel, has a least width of 500 feet and least depth of 21 feet and leads into the channels passing east and north of Neebish Island. The westerly side of the channel for a least width of 300 feet and substantially greater widths at the turns, has a depth of 27 feet, and is marked by **Winter Point Range** lights on the lower end of Neebish Island. This range is centered on the deep draft portion of the channel.

Course 9.—This course, from Munuscong Lake to Johnson Point, has a least width of 500 feet and least depth of 21 feet. The westerly side of the channel for a least width of 300 feet and substantially greater widths at the turns has a depth of 27 feet, and is marked by the **Sailors Encampment, Ont.,** West Range lights on St. Joseph Island. This range is centered on the deep draft portion of the channel. The shallow draft portion of the channel is marked by the Sailors Encampment East Range of white daybeacons which are 200 feet easterly of the other range. An L shaped Government wharf, having a face parallel to the river of 46 feet, and a depth of 8 feet at the face, has been constructed just north of the range lights. **Everens Point,** Ont., is located on the right bank as the most southwesterly point of land closest to the channel. **Johnson Point,** Neebish Island, is located on the left bank about on the turn into Middle Neebish Course 8.

Course 8.—This course from Johnson Point to **Mirre Point,** Neebish Island has a width of 1,000 feet and least depth of 21 feet. The westerly side of the channel for a least width of 600 feet and substantially greater widths at the turns has a depth of 28 feet, and is marked at the lower end by the Rains Wharf, Ont., Range lights on St. Joseph Island and at upper end by the **Point of Woods,** Neebish Island Range lights. Both of these ranges are centered on the deep draft portion of the channel. **Dark Hole** is on Neebish Island south of the turn into Middle Neebish Course 7 and is marked with the Dark Hole ranges for that course 7.

Course 7.—This course from Mirre Point to **Stribling Point, Ont.,** located on the northwesterly point of St. Joseph Island, has a least width of 500 feet and least depth of 21 feet. The westerly side of the channel for a least width of 300 feet and substantially greater widths at the turns has a depth of 27 feet, and is marked at the lower end by the Dark Hole West Range Lights on Neebish Island and at the upper end by the **Harwood** Point West Range lights on the most southerly point of Sugar Island, Mich. These ranges are centered on the deep draft portion of the channel. Two hundred feet easterly from these ranges the shallow draft portion of the channel is marked at the upper end by the Harwood Point East Range of daybeacons; and at the lower end by the Dark Hole East Range of daybeacons.

At the turn from Course 7 to Course 6, a passage leading to the northeast between Stribling Point and Harwood Point provides access to the St. Joseph Channel and the Lake George Channel. The Hen and Chickens Range lights off the east shore of Neebish Island and marking the channel through the passage, were discontinued in 1968.

Lake George Channel.—This channel passes through Lake George and around the north end of Sugar Island. The available depth before improvement was 7 feet. The least width of channel is 150 feet, with about 12 feet depth. It is abandoned except for rafts and small craft. The route is marked by buoys and daymark ranges (some obscured by trees).

Course 6.—This course, from Stribling Point to the lower end of Lake Nicolet passes to the northwest between Neebish Island to the south and Sugar Island on the north, and has a least width of 500 feet and least depth of 21 feet. From the turn at Stribling Point, the channel is wider for 1½ miles to the dike at the north edge of the channel. The southeast end of the dike is marked by Middle Neebish Channel Light 50, and the northwest end of the dike is marked by Light 58 with lighted buoy 62 located at the north side of the turn into Course 5 at the lower end of Lake Nicolet. The southerly side of the channel for a least width of 300 feet and substantially greater widths at the turns, has a depth of 28 feet, and is marked by the Stribling Point South Range lights and by the Middle Neebish Channel South Range lights. These ranges are centered on the deep draft portion of the channel. Two hundred feet northerly from these ranges the 21-foot shallow draft portion of the channel is marked by the Middle Neebish Channel North Range consisting of a front light and a rear daybeacon; and the Stribling Point North Range of daybeacons.

The Middle Neebish Channel Range Lights and daybeacon are located in open water at the foot of Lake Nicolet. They are well protected by rip-rap and should not be passed close aboard.

Course 5.—This course from the lower end of Lake Nicolet to the upper junction with the West Neebish Channel downbound course, near Ninemile Point, on Sugar Island, Mich., has a least width of 500 feet and a least depth of 21 feet. The westerly side of the channel for a least width of 300 feet and substantially greater widths at the turns has a depth of 27 feet, and is marked by the Lower Nicolet West Range lights on Neebish Island. These ranges are centered on the deep draft portion of the channel. Two hundred feet easterly from this range the 21-foot shallow draft portion of the channel is marked by the Lower Nicolet East Range.

Above Course 5, the upbound channel parallels and is east of the downbound channel along Course 4 through Lake Nicolet.

West Neebish (Downbound) Channel, Mich.—The channel is 18.4 miles in length between the junctions, with the Middle Neebish Channel in Lake Nicolet at the upper end and in Munuscong Lake at the lower end. The least width is 300 feet and least depth 27½ feet. The upstream four of the five courses of the channel are marked by ranges or leading lights, and all courses are marked by side lights and buoys.

Course 4.—This course is a continuation of Course 4 through Lake Nicolet and extends from the upper junction with the Middle Neebish Channel just above Light 58 on the West Neebish Channel near Ninemile Point, to the turn into Course 5 at Light 48 about two miles upstream from Sand Island, the northwest tip of Neebish Island. It has a least width of 300 feet and a least depth of 27½ feet. West Neebish Channel Upper Range Light, on the same structure as Middle Neebish South Range Rear Light, located in lower Lake Nicolet, is centered on the channel. The West Neebish Channel Upper Range Rear Light is located on the northerly end of Neebish Island.

Course 5.—This course, from the turn about two miles above Sand Island to the head of the Rock Cut, has a least width of 300 feet, and least depth of 27½ feet. Downstream, to the channel, is marked by West Neebish Channel Range lights on the mainland, centered on the channel at the turn into Course 6. U.S. Coast Guard Lookout Station No. 4 is on the mainland about 2,000 feet northeast of the leading light and has a fog horn. A radio mast near the lookout tower forms a prominent landmark.

Course 6.—This course, from the head of the Rock Cut, passing the lower dam, to the turn at buoy 24 about one-half mile upstream from Sawmill Point, which is on the mainland, has a least width of 300 feet and a least depth of 28½ feet. The upper end of the channel is marked on both sides by a vertical rock masonry wall. Rock Cut Lower Leading light, located on Neebish Island, opposite Sawmill Point, is centered on the channel.

Course 7.—This course, from the turn about one-half mile upstream from Sawmill Point to Moon Island located west of Light 14 on the southeast edge of the channel at the turn into Course 8, has a least width of 300 feet and a least depth of 28½ feet, and enters into the northerly end of Munuscong Lake. Moon Island Leading light, located on the northwest end of Moon Island, is centered in the channel.

Course 8.—This course, from Moon Island through Munuscong Lake to the lower junction with the Middle Neebish Channel and Lower Course 8 in Munuscong Lake, has at least width of 300 feet and least depth of 27½ feet and is marked by the junction buoy at the junction.

Course 4—Middle Lake Nicolet (upbound), Mich.—The course through the open water of the lake from the upper most lights of West Neebish Channel to Six Mile Point is about 4 miles long. The upbound channel through this reach is marked by Upper Nicolet range lights which are located on Sugar Island east of Frechette Point. Under the existing project, a depth of 20 feet has been obtained over a width of 1,500 feet through Middle Lake Nicolet.

Six-Mile Point Range Front Light in 8 feet of water, ½ mile above Six-Mile Point, is shown 18 feet above water from a dolphin. The base of the pier is surrounded by rip-rap extending horizontally out from the structure about 22 feet, and should not be passed close aboard even by vessels of shallow draft.

Anchorage Area.—Lake Nicolet Anchorage Area, an anchorage area 28 feet deep on the west side of the vessel course just upstream from the junction of the West and Middle Neebish Channels, extends approximately 2¼ miles, being flared from the west channel line at each end, to a 1,000-foot width for one mile at the midpoint.

Courses 3 and 2—Upper Lake Nicolet.—The dredged channel above Six Mile Point at the head of Lake Nicolet

is about 4½ miles long and 27 feet deep, with a width of 1,500 feet at Six Mile Point and decreasing to 600 feet in about 1½ miles through Course 3 to below **Frechette Point** and continuing thus for the northerly 3 miles of Course 2 through **Little Rapids Cut** to Angle Courses 1 and 2 in the turn into the approach to the locks. Course 3 is marked on its upstream prolongation by the Frechette Point Range Lights. Course 2 is marked on its downstream prolongation by the Six Mile Point Range Lights.

A buoyed small boat channel leads northwesterly from just upstream from Frechette Point Rear Range Light to the area between the mainland and the group of islands lying westerly of Little Rapids Cut. Marina facilities are located on the mainland side of this channel. A submarine power cable extends across the Little Rapids Channel from a point 275 feet upstream from Little Rapids Cut Light 96 on Island No. 1, westerly to Island No. 2.

Charts 14884, 14962—Bayfield Channel.—From the upper entrance to Little Rapids Cut, head of Lake Nicolet, to the canals, the improved vessel channel is marked by Bayfield Rock Range lights on the northwest point of Sugar Island. This channel has a depth of 28 feet over the entire width except for that area north of a line connecting the end of East Center Pier with the intersection of the International Boundary and the North Bayfield Channel line. The remainder of the course including the approach to the north canal has a depth of 23.1 feet.

Little Rapids Cut lighted buoy 105 is at the easterly end of Bayfield Channel on the turn from the lower river between Island No. 1 and Island No. 2.

St. Marys Falls Canal and Locks, Mich.—The rapids of the St. Marys River, located about 14 miles below the head of the river at Point Iroquois, are about ¾ mile long and ¼ mile wide, and the fall ranges between 18 and 24 feet with the varying stages of water. The improvement by the United States comprises the canals and locks constructed to overcome these rapids, and a hydroelectric power plant.

The distance between the eastern and western ends of the United States Canals is about 1.9 miles. The canals are faced with revetment walls and piers of timber, steel and concrete. The total width of the easterly entrance between the Brady (southeast) and northeast piers is 1,215 feet. The width of the westerly entrance, where the two canals are in one, is 1,103 feet between the north and south piers, reducing to 795 feet in a distance of about 2,400 feet, or to the west end of the center pier which separates the south canal leading to the MacArthur Lock and the New Poe Lock, and the north canal leading to the Davis and Sabin Locks.

South Canal.—The width of the south canal is variable, being about 723 feet at the lower entrance between the Brady and east center piers, 304 feet at the basin above the MacArthur Lock, and 410 feet at the upper entrance. The lower approach has a minimum depth of 27½ feet. The upper approach has been dredged to a minimum depth of 28 feet.

The **MacArthur Lock** is near the lower end of this canal, is 800 feet long in chamber between gates, 80 feet wide and has a depth of 31 feet.

The new **Poe Lock**, approximately parallel to and immediately north of the MacArthur Lock, was formally dedicated in 1969. It is 1,200 feet long between gates, 110 feet wide and has a depth of 32 feet.

In April 1978, shoaling to 26 and 27 feet existed in the western approaches to Poe and MacArthur Locks, respectively.

North Canal.—The width of the North Canal is 493 feet in the lower entrance at the outer ends of the east center pier and northeast pier, 310 feet in the basin above the locks, 282 feet at the bascule bridge, and 350 feet at the west end. The least depth of water in this canal, as limited by the locks, is 23.1 feet.

The **Davis Lock**, which is approximately parallel to and north of the Poe Lock, is 1,350 feet long between gates, 80 feet wide, and has a least depth of 23.1 feet. The **Sabin Lock** parallels the Davis Lock on its north side, has the same dimensions, and is connected with the same canal. Both are operated by electric power.

Vessels intending passage through the St. Marys Falls Canal are to contact the Soo Locks on VHF-FM channel 16 (156.80 MHz) for transit instructions when reaching Bayfield Dike Light when upbound, and **Big Point** when downbound. The voice call is Soo Locks or WUD-31. In order that the dispatch made will cause the least delay to the vessel involved, vessel masters are requested to refrain from making their dispatch calls prior to reaching the above locations.

Signals to Enter Lock.—Upbound signals consisting of two lights about 12 inches in diameter, 1 red and 1 green, facing east, are located on the southeast wall ends of each lock to indicate to upbound vessels when it is safe to proceed into lock chambers. These signals will normally be set to show red and will be changed to green only when it is safe and permissible for each individual vessels to enter the lock. Vessel masters are cautioned not to enter a lock chamber upbound except on a green light signal, even though the lock gates may be open.

Recreational Craft Movement Through Locks.—Upbound recreational craft mariners desiring lockage shall report to the East Center Pier Shelter. Downbound recreational craft mariners desiring lockage shall report to the Southwest Pier Shelter.

Minimum requirements have been established for passage of recreational craft:

1. No restriction or minimum for size or weight.
2. Must have power and auxiliary movement source (Oars, etc.).
3. No row boats or canoes.
4. Life jacket for each person in boat.
5. 75 feet of line to reach top of wall.
6. Lock report forms available at Shelters.

Landing at East Center Pier.—Vessels approaching this pier are cautioned against landing too close to its outer end because of eddy currents.

In emptying the northerly locks an eddy is formed along the southeast pier, moving upstream. When the south-

erly locks are being emptied, the current at the end of the center pier flows northward. When the northerly locks are emptying, this latter current is usually reversed. Wind conditions alter the situation.

Handling of Vessel Mooring Cables.—Before entering a lock, all vessels shall put heaving lines, attached to forward and aft cables, out onto the approach pier, and either line or cable shall be continuously carried by the vessel deckhands or canal linesmen until the vessel is moored in the lock chamber in all cases where the mooring is made on the side of the lock adjacent to the approach pier used. Vessels intending to moor on the side of the lock opposite that adjacent to the approach pier shall, in the same manner, put out heaving lines and have the line or cable continuously carried along the approach pier, shall take them in just as the lock is entered, and put them out again on the mooring side of the lock as soon as possible.

Signals as to Filling.—In order that masters of downbound vessels approaching the northwest pier may know when either the Davis or the Sabin Lock is filling, three signals have been established. These consist of flashing yellow lights, one placed on top of a light pole at the end of the upper nose pier between these two locks, the second at a point approximately 100 feet upstream of the railroad bridge on the northwest pier and the third on top of a light pole approximately midway between the Railway Bridge and the end of the northwest pier. The lights flash during the first 8 minutes of each lock filling, which is the period when flow toward the lock is increasing. In order that masters of downbound vessels approaching the Southwest or West Center Piers may know when either the MacArthur or the Poe Lock is filling, a signal consisting of a flashing yellow light has been established. This signal is mounted on the top of a light pole at the end of the nose pier between the MacArthur and Poe Locks. The light flashes during the period when either lock is filling.

Closure to Traffic During Periods of Low Visibility.—Whenever, in the opinion of the Detroit District Engineer or his authorized representatives at St. Marys Falls Canal, the safety of lock structures or vessels in the canal area might be jeopardized by the continuance of vessel movements during periods of low visibility, all vessel movements in the canal area, and in approaching and entering the canal area, may be stopped. Whenever the stopping of vessel movements becomes advisable the U.S. Coast Guard will be informed and will take such usual action as is necessary to advise vessels approaching St. Marys Falls Canal, and to direct their anchoring. The chief lockmaster in the control tower at St. Marys Falls Canal will personally direct, by radio telephone, all movements of vessels in the locks area at the time the stop order is issued, and may approve continued movement or order mooring at specified locations.

Current Toward Edison Sault Electric Co. Canal.—A current, which apparently does not exceed 1 mile per hour, sets toward the Edison Sault Electric Co. canal entrance immediately on the south of the west or upper end of the ship canals. A westward enlargement of the power canal entrance in 1943 and a 1,200-foot extension of the southwest pier in 1945 were made to reduce the effect of the cross current along the south side of the navigation channel. Downbound vessels should make allowance for this current when approaching the southwest pier for the MacArthur Lock.

Landing at Northwest Pier.—Vessels should reduce speed to 2½ miles per hour upon entering the canal (see § 207.440 par. (f) of Rules and Regulations, preceding) and should hold as far as possible to northward of Vidal Shoals range (keeping safe from cross currents due to flow over the rapids), in order to make a broadside landing at the pier. It is advisable that landings be made about 1,000 feet from the pier end, in order to make ample allowance for northward drift resulting from the rapids discharge.

Landing at West Center Pier.—The filling of the locks causes a current to set across the end of the west center pier, this current sometimes being in one direction and sometimes in the other. Vessels bound for the Davis Lock should not attempt to make the pier near its end.

Landing at Southwest Pier.—Downbound vessels dispatched to the MacArthur Lock are cautioned to hold the Vidal Shoals range until due north of the Southwest Pierhead Light. Due to the strong current at the end of the southwest pier, such vessels should pass at least 200 feet to the north of the end of this pier. A flashing white light is shown on the pier 1,000 feet east of its west end, at pier height; vessels should land east of this light.

Aids to Navigation.—The lower entrance is marked by the Bayfield Rock Range of fixed white lights, on the northwest point of Sugar Island.

The upper approach to the canals is marked by Vidal Shoals Channel Range: the front light is about 230 feet north of the face of the northwest pier and about 170 feet west of the International Bridge, and the rear light is about 2,700 feet 076° from the front light. There is also a white, oval-shaped, horizontally slatted daymark, 10 feet wide and 18 feet high, 22 feet above water on the Vidal Shoals Channel range line about 850 feet in advance of the front light.

On the ends of the piers at the upper and lower entrances to the canal, the following lights are maintained by the canal authorities: The end of the southeast pier is marked by a fixed red light 9 feet above the water. Fixed red lights, each 20 feet above the water, mark the ends of the west center pier, the northwest pier, and the east center pier. The southwest pier and northeast pier are marked by fixed red lights 20 and 21 feet above the water, respectively.

Radio Facility—Station WUD-31.—The Chief Lockmaster's vessel dispatch station in the tower of the Administration Building is equipped with radiotelephone operating on VHF-FM channels 14 (156.70 MHz) and 16 (156.80 MHz). This station is considered to have an effective operating range of approximate 50 miles. Operation is limited to communication with vessels on matters related to canal operation and traffic movement through the locks and for emergency purposes and masters are urged to provide supervision of the vessel's radiotelephone

when approaching and transiting the canals so as to be promptly advised of changes in lock dispatch, impending bridge closures, etc.

General Information.—Masters or clerks of vessels using the canals are required to report as specified in § 207.440, par. (k), of Rules and Regulations preceding. Vessel transit forms for these reports and copies of all Rules and Regulations can be obtained on application at the U.S. Canal Office, located in the operations building adjacent to the Davis Lock.

In the operations building there are also a Notary Public and a marine post office designated Canal Station.

Vessels requiring special services while in the United States locks should contact the Canal station WUD-31 by radiotelephone in advance to expedite necessary arrangements by canal authorities. Similar facilities are available for vessels using the Canadian Canal and contacting the Canadian radiotelephone at Sault Ste. Marie, Ont.

Navigation Regulations—St. Marys Falls Canal and Locks, Mich.—See 33 U.S.C. 1, published in Certain Laws, preceding, and § 207.440 and § 207.441, of Rules and Regulations, preceding.

Sault Ste. Marie (Canadian) Canal, Ontario.—This canal is a cut through red sandstone rock, 7,295 feet (about 1.4 miles) long from end to end of upper and lower piers, and its general width is 150 feet at the water surface and 141 feet 8 inches at the bottom. The approaches above and below the canal are channels dredged through boulder shoals and marked by suitable buoys and range lights. The lower approach is 16.8 to 18.5 feet deep, being 230 feet wide on the southerly side of the range line, and 160 feet wide on the northerly side immediately east of the south pier; but thence southeasterly the channel widens on its northerly side so as to strike the southwest corner of the Algoma Central & Hudson Bay Railway dock, which is 290 feet from the range line. The upper approach has depths of 21 to 24 feet, and from the end of the north pier, it widens in its westerly extension to beyond the axis of the range leading from Vidal Shoals, the width being 500 feet abreast of the end of the south pier.

All entrance piers marking the ends of the approaches to the Canadian Canal are marked by a yellow light.

Vessels approaching the canal from Sault Ste. Marie Harbour or the International Channel below the lock shall keep on range until abreast of the Lower Entrance Light No. 1067 (Can. LL-1973) and then turn westward so as to pass between the alignment of the North-east and South-east piers. The South East pier being on the port side is the tie up pier while awaiting the lock when upbound and approach pier when entering the lock.

Mooring to the North East pier can only be under instruction from the Lockmaster.

Vessels approaching the canal from the Vidal Shoals shall keep on range until abreast of the upper turning Buoy No. 1072 (Can. LL-1973) and shall then turn eastward so as to pass between the alignments of the Northwest and South-west piers. The North West pier being on the port side is the tie up while awaiting the lock when downbound and approach pier when entering the lock.

Mooring to the South West pier can only be under instruction from the Lockmaster.

Masters of vessels are cautioned of cross currents at the Upper Entrance that result from the Power Canal immediately to the North of the North-west pier and Lake Superior Control Dam immediately to the South of the South-west pier.

Lock.—A masonry lock is located near the east or lower end of the canal, with a maximum permissible usable length of 852 feet and maximum permissible vessel beam of 59 feet with a depth of 16.8 feet over the sills at LWD. The gates and culvert valves are operated by electricity.

The Canadian lock operates between 0800 and 2400 local time daily. Vessels must be between piers by 2330 to lock through before the next morning.

Vessels intending passage through, or departing from, the Canadian Canal are to maintain radiotelephone contact with the Canadian Canal between Six Mile Point and Brush Point. Radiotelephone procedure is as follows:

—Upbound vessels shall call the Canadian Canal on VHF-FM channel 16 (156.80 MHz) when reaching Six Mile Point, using either voice call CANADIAN CANAL or VDX-23. Upon making contact, switch to VHF-FM channel 14 (156.70 MHz) for transit instructions.

—Downbound vessels shall follow the same procedures when at Brush Point.

—Masters are reminded that they should switch back to Channel 16 when they have received their transit instructions.

—If, for some reason, the Master changes his mind and wishes to proceed through the U.S. locks, he should advise the Station immediately.

—Vessels intending to proceed to Canadian docks above or below the lock should advise the Station giving their destination. When leaving a dock to proceed toward the lock, vessels should contact the Canadian Lock by radiotelephone as described above.

—Vessels departing the Canadian lock or Canadian docks shall give the customary security calls.

Vessels approaching the Canadian Lock should blow 3 long, and 2 short (— — — — —) at the Turning Buoys located approximately 1,000 feet east and west of the entrances to the canal reaches.

At each entrance to the lock there is a signal showing red and green lights, alternatively.

"Limit of Approach" signs are on the south downstream pier 425 feet from the Lower Lock Gates and on the north up-stream pier 1,700 feet from the Upper Lock Gates.

A steady red light or no light indicates that an approaching vessel shall stop and be made fast before reaching the sign "Limit of Approach" where the vessel shall wait until a green light is shown.

Vessels shall not make fast to the north downstream pier or south upstream pier without prior permission from the Lockmaster.

Upon entering the lock a downbound vessel shall come to a full stop when the bow has reached a point 200 feet from the lower gates, and likewise an upbound vessel

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shall come to a full stop when the bow has reached a point 200 feet from the upper gates. Stop signs are painted on the lock walls.

When in distress or unable to determine from the lock signal light whether or not to proceed past the entrance piers, a vessel may contact the Canadian Lock, VDX-23, on VHF-FM channel 16 (156.80 MHz) for instructions. Upon making contact, the vessel should switch to a working frequency.

Upbound small craft—recreational type, shall use "Small Craft Landing" at knuckle on North East pier. Designated by sign and blue light. Tie up and use telephone to obtain instructions. Downbound "Small Craft Landing" at knuckle on South West pier. Designated by sign and blue light. Use telephone to obtain instructions. Minimum requirements for passage of recreational craft.

1. No restriction or minimum size or weight.
2. Must have auxiliary movement source such as oars.
3. 75 foot line to reach top of wall.
4. Life jacket for each person on boat.

Vessels and Pleasure Craft transiting the Canadian Canal shall be governed by regulations established by the Canadian Government. Copies of the regulations can be obtained at the canal office.

Bridge.—The International Railway Bridge crosses the canal with a swing span of about 156 feet clear width between canal walls, and 15 feet clear height. The draw does not sound any whistle, and the closure of the draw is indicated by an automatic semaphore. Boats should sound three long blasts of a whistle (— — —) as a request for opening the draw if it be found closed. The bridge, if closed at night, should show a red light and when open, a green light.

Sault Ste. Marie, Mich.—The harbor front of the city extends about 1½ miles below the United States Canal properties. The available depth is about 19 feet along the wharves extending from the locks southeasterly to the Pittsburgh Steamship Division's dock.

Public docking facilities have been provided by the City and the Michigan State Waterways Commission and are located off the main channel approximately three miles downstream from the locks. Water, electricity, sewage pump-out facilities, and lights are available with gasoline located at commercial installations nearby. A launching ramp is also available.

Coast Guard.—The Coast Guard Base is about ½ mile below the St. Marys Falls Canal at Southeast Pierhead Light. The Coast Guard Group Office is on the base.

Radio Facilities-U.S. Coast Guard.—A communications center on the base handles both vessel traffic communications and Search and Rescue communications.

Vessels transiting U.S. waters of the St. Marys River between De Tour Reef and Parisienne Island shall establish radiotelephone contact on VHF-FM channel 12 (156.60 MHz) with the Coast Guard vessel traffic control center, voice call SOO CONTROL.

Communications to the Coast Guard relating to distress and/or communications other than vessel traffic movement are made utilizing voice call COAST GUARD GROUP SAULT STE. MARIE on VHF-FM channels 16 (156.80 MHz) and 22 (157.10 MHz).

Bridges—International Highway Bridge.—The Sault Ste. Marie International Bridge extending from Sault Ste. Marie, Mich., over the St. Marys River to Sault Ste. Marie, Ont., was completed in 1962. The bridge is approximately 125 feet downstream and parallel to the existing railway bridge west of the Falls. This structure consists of 3 high level fixed spans, each with a horizontal clearance of 410 feet, and vertical clearances of 124 feet across South Canal and North Canal, and 120 feet across Canadian Canal.

The International Railway Bridge crosses the canals above the locks. Across the south canal there is a lift bridge span, electrically operated and having clear heights of 123 feet in the raised position and 16 feet in the lowered position. Across the north canal there is a double-leaf bascule, electrically operated, with clear opening between canal walls of 282 feet and clear height of 13.7 feet when closed. The leaves do not open to a vertical position. When fully raised, the lower cord of the south leaf is about 65 feet above normal water level on a vertical line at the face of the pier fenders, and the lower cord of the north leaf is about 68 feet measured along a similar line. The bridge is continued across the river at the head of the rapids by nine fixed spans, each of approximately 232 feet clear width and 15 feet clear height.

The lift bridge has two lights located on both the upstream and downstream lower chords and approximately one quarter of the distance from their ends. These four lights show green when the span is in its completely raised position and show red when it is at any point below the completely raised position. The bascule bridge has a red light on upstream and downstream end of each abutment; a light on the upstream and downstream side of outer end of each leaf, swinging with leaf and showing red when bridge is closed and green when open.

Both draws ordinarily remain open. Traffic is governed by signal lights operated from the bascule bridge for railway traffic and by a horn for vessel traffic. If light signal indicates clear track, the locomotive sounds two blasts before proceeding onto the bridge. The regulations for opening draws for vessel traffic follow.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding, and 33 CFR § 117.695 of Rules and Regulations, preceding.

Sault Ste. Marie, Ontario.—Above the Canadian Canal, the approach to the Algoma Steel Corporation's slip and docks has a dredged depth of 22.8 feet.

The Canadian waters below the Canadian Canal, easterly from the southerly extension of the east face of the Algoma Central Railway wharf, have been dredged prior to 1975 to a depth of 20 feet. The north limit of this dredging is a line 70 feet south of the face of the private wharves easterly to the Government wharf thence along the south face of the Government wharf, thence easterly to an intersection with the U.S. channel at the west end of Bayfield stone dike.

Government Wharf.—The Government wharf on the river front below the Canadian Canal is of concrete con-

struction, extends out 600 feet 221° from the shore at the south end of Pim Street, with an L end extending about 315 feet 292°. There are large freight sheds on the wharf. The southeast and southwest corners of the wharf are marked by lights and a light 23 feet above the water marks the extreme west end. A slip 500 feet long and 20 feet deep, with width of 200 feet at its entrance and 80 feet at its inner end, extends along the east side of the wharf. The east side of the slip is marked by a buoy. The basin on the west side of the wharf, within the L, has an available depth of 16 feet for a length of 300 feet measured along the west face of the wharf.

Radio Facility.—A marine radio station at Sault Ste. Marie, Ont. (call sign VBB) is operated continuously during the navigation season. Extended range ship-shore VHF transmitting and receiving facilities at Bald Head, Ont. and Blind River, Ont. are remotely controlled from this station.

Above St. Marys Falls, the water course proceeds through Vidal Shoals and on around Pointe aux Pins and into Whitefish Bay at the southeast end of Lake Superior.

Vidal Shoals are located in the approach to the American and Canadian Canals at Sault Ste. Marie, and two channels leading to the respective canals have been dredged through the shoals.

The improvement by the United States has provided a channel 28 feet deep and 1,500 feet wide, which enables downbound vessels to approach the northwest pier of the American Canal nearly in line and facilitates their landing. The vessel course is marked by range lights located on the north side of the American Canal; also, a daymark is located on the range line in advance of the front light. The southerly edge of the channel is marked by buoys. The northerly edge is marked by a buoy at the westerly end; by a buoy on the westerly side of the entrance to the Canadian channel at its junction with the American channel; by a junction buoy at the dividing point of the two channels; and by a buoy approaching the American Canal.

The Canadian channel through the shoals is 500 feet wide, its side lines being well marked by buoys and the vessel course by a range of lights at the head of the Canadian Canal. In Jun 1975, a least depth of 22.8 feet was reported in the channel by sonar sweep.

A buoy, placed to the eastward of Vidal Shoals, marks the west side of the channel crossing between the United States and Canadian Canal approaches.

The C. Reiss Coal Company has a dredged channel 21 feet deep and about 80 feet wide, leading southerly from the Vidal Shoals Channel to the company's dock, formerly known as the North Western-Hanna Fuel Co. Dock. Soundings taken in August 1966 showed a controlling depth of 21 feet in the slip for a distance of 600 feet.

Vidal Shoals Channel.—Above Vidal Shoals, there is a natural wide passage of deep water properly buoyed, rounding **Big Point, Mich.** The abandoned Coast Guard Dispatch Station is located at the outer end of a pier extending out from this point. Small craft now report at the Southwest Pier Shelter for clearance to pass through locks.

Recreational Craft Movement Through Locks.—Downbound recreational craft mariners desiring lockage shall report to the Southwest Pier Shelter. Upbound recreational craft mariners desiring lockage shall report to the East Center Pier Shelter.

Minimum requirements have been established for passage of recreational craft:

1. No restriction or minimum for size or weight.
2. Must have power and auxiliary movement source (Oars, etc.).
3. No row boats or canoes.
4. Life jacket for each person in boat.
5. 75 feet of line to reach top of wall.
6. Lock report forms available at Shelters.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. Off Big Point a submerged potable water intake crib about 1,700 feet offshore is marked by a buoy.

Pointe aux Pins Course.—This course extends southwesterly from the turn off Big Point to a turn between **Pointe aux Pins and Brush Point.** It has been improved to a minimum width of 1,200 feet and depth of 28 feet and is marked by the Pointe aux Pins Range lights which are located near the end of Point Louise about a mile southwest of the easterly tip of Pointe aux Pins.

Submarine Pipeline.—A 10 inch submarine pipeline, carrying natural gas across the St. Marys River between Brush Point on the southerly shore and Pointe aux Pins on the northerly shore, is located near the junction of Pointe aux Pins Course and Point Louise Channel, laying in a northwesterly direction from Brush Point. The pipeline is buried a minimum of 10 feet below the existing river bottom except that part extending from the southerly channel bank in shallow water to the shore where it is buried a minimum of 5 feet.

Point Louise Channel and Point Louise Turn.—This channel extends from abreast Brush Point to opposite Pointe aux Pins Main Light which is on the south tip of Point Louise, Ont. The short reach of transition from the Point Louise Channel to the Brush Point Course is called the Point Louise Turn. Both the channel and turn have a minimum width of 1,200 feet and depth of 28 feet.

Brush Point Course.—Marked by the Brush Point Range lights, this course from the Point Louise Turn through the **Round Island Shoals** to the turn onto the Birch Point Range has depths of 28 to 30 feet and a minimum width of 1,250 feet.

The improvement by the United States has provided a channel 28 feet deep for a width of 1,250 feet at lower Brush Point Course abreast of **Cedar Point, Mich.**

The improvements by the United States at the turn at the downstream end of the Birch Point Course, to the northwest of Round Island, has provided a depth of 30 feet in the channel and over the former middle

ground shoal along its southerly side. The improved area has a least width of 1,250 feet at the easterly end, flaring broadly to the westward on the turn at the intersection of courses marked by Brush Point and **Birch Point** ranges. A midchannel buoy is located in mid-channel on the line of Birch Point range and 8,800 feet from the front light. The southerly limits of the deep area are marked at the eastern end by a buoy, and thence westward by two buoys. The northerly line is well marked with buoys.

The improved channel along the Birch Point Range through the head of the river has a minimum width of 2,000 feet and minimum depth of 30 feet. The improvement includes dredged cuts through Point Iroquois Shoals and Gros Cap Reef.

Point Iroquois Shoals.—From the shore between 1 and 2 miles southeasterly from **Point Iroquois**, a sandy flat with a minimum depth of 13 feet at the outer edge extends off a distance from 1½ to 1¾ miles. Buoy #47, in 30 feet of water, 13,400 feet 278° from Gros Cap Reef Light, marks the northeast side of an isolated boulder shoal with a least depth of 24 feet. Buoy #45 is in about 32 feet of water northwest of the shoals and about 6,600 feet, 162° from Gros Cap Reef Light. The outer edge of the shoals, along the deep vessel channel, is marked by buoys. The opposite bank of the deep passage, formed by the shallow area reaching from the Canadian shore at **Pointe aux Chênes**, is indicated by two buoys. The vessel course is marked by range lights at Birch Point.

Gros Cap Reefs, Ont., almost due north of Point Iroquois, comprises a detached rocky group with limiting depths of 17 to 20 feet, lying from 1 to 1.8 miles in a southwesterly direction from **Gros Cap, Ont.** A concrete capped crib is located on the shoal, 11,100 feet 023° from Point Iroquois Old Lighthouse and approximately 550 feet northeasterly from the dredged channel bank and is marked by a light about 45 feet above the water, by a fog horn, and a radar responder beacon (Racon) Morse Code D (— . .). A combination marine-aviation radiobeacon transmitting on 286 kHz, is operated continuously the year round. There is a steel skeleton radiomast 132 feet in height located on this crib. A detached reef of bed rock with 4 feet least depth lies 900 feet northwesterly from Gros Cap.

Brimley, Mich. is on the **Waiska River**, ¼ mile above the mouth, about 11½ miles upstream from St. Marys Falls Canal. An unmarked channel, about 500 feet off the mouth of the Waiska River at the southeast end of **Waiska Bay**, extends in a northeasterly direction to deep water in the St. Marys River. In August 1966, the controlling depth in the channel was 6 feet. Persons unfamiliar with this area should not attempt the river entrance in adverse weather.

13. LAKE SUPERIOR

Depths and vertical clearances under aerial crossings and bridges herein given are referred to Low Water Datum, which for Lake Superior is an elevation 600.0 feet above mean water level at Pointe-au-Pere (Father Point), Quebec, on International Great Lakes Datum (1955).

DIMENSIONS, ETC.

Length, steamer track, Duluth Canal to Point Iroquois (approximate) ..... miles	383
Length (right line in clear), Duluth Canal to Michipicoten Harbor ..... miles	350
Breadth, about longitude 86°45′ ..... do	160
Depth, maximum recorded ..... feet	1,333

Areas in square miles:	United States	Canada	Total
Water surface of lake*	20,600	11,100	31,700
Entire drainage basin	37,500	43,500	81,000

*Including St. Marys River above Brush Point.

GENERAL DESCRIPTION

Lake Superior is the largest of the Great Lakes, and also one of the largest expanses of fresh water on the globe. It is characterized by deep water and by high and rocky shores along a large portion of its coast. Compared with the other Great Lakes, its surface is more elevated above the sea, it is more irregular in outline, has deeper and colder water, more fog, more shore ice, a shorter season of navigation, less rain, about the same snowfall, and winds and seas not greatly different.

Navigation Season.—The navigation season on Lake Superior is generally about eight months in length, ice conditions and cold weather making it impracticable to continue through the winter months. The actual length of season depends primarily on the demand for tonnage which justifies the expense of ice breaking for earlier or later vessel movements. Commercial fishing operations from the various harbors around the lake continue throughout the year except where prevented by ice conditions.

Anchoring of Vessels.—Cautionary Notice.—When coming to anchor vessels masters are cautioned not to foul submarine cables. Fouling cables may not only result in disrupting utility services to adjacent communities but also expose the mariner to the danger of high voltages carried by certain cables. Mariners are advised to slip the anchor rather than cut the cable if the normal practice of good seamanship fails to clear the fouled anchor. Lost gear or damaged cables should be reported to the authority having jurisdiction over the waterway.

Fluctuations of Water Level.—The average or normal elevation of the lake surface varies irregularly from year to year. During the course of each year the surface is subject to a consistent seasonal rise and fall, reaching its lowest stage usually at about the close of winter and attaining its highest stage during the late summer.

Through joint action on the part of the United States and Canada, the elevation of Lake Superior is being regulated by compensating works located in the St. Marys River at the head of St. Marys Falls, which consist of dikes and sluice gates so operated as to vary the volume of discharge from the lake. The Orders of Approval permitting the construction of said works in the St. Marys River also provided that the works be so operated as to maintain the monthly mean levels of Lake Superior as nearly as may be between elevations 600.5 and 602.0 feet (IGLD 1955) and in such a manner so as to benefit navigation and reasonably protect the property and interests, public and private, in both countries above said works.

In addition to the annual fluctuation, there are also oscillations of irregular amount and duration produced by storms. Some of shorter period are caused by squall conditions, the water level fluctuations being produced by a combination of wind and barometric pressure changes that accompany the squalls. These fluctuations last at the most a few hours. A storm of this type on June 16, 1939, produced fluctuations at Marquette with a maximum range of 7.4 feet. At other times the lake level is affected by winds of sufficient speed to drive the surface water forward in greater volume than that carried by the lower return currents, thus raising the elevation on the lee shore and lowering it on the weather shore. These wind-produced changes are generally for a somewhat longer period, such as many hours or a day, and may cause changes in water level up to about 2 feet, depending on the sustained strength and direction of winds, but seldom exceed 1 foot above or below the normal level.

The unusually severe storm of November 28, 1905, temporarily raised the water level by 2.3 feet in Duluth Harbor.

Weather Conditions.—There is often considerable wave action in Lake Superior because of the possible long fetches of wind. However, during storms the water rises less on the lee shore and falls less on the weather shore than it does on the shoaler lakes, as the greater depth of water allows the lower return currents to flow more freely. During the summer months the perils of navigation are mainly those of fog and squall winds, the latter occurring frequently in connection with thunderstorms. In the spring and fall the lake is foggy, stormy, and dangerous. Late in the navigation season, ice accumulation on ships is sometimes a problem. The highest wind velocity, as derived from longtime records of the National Weather Service for certain shore stations, is 79 knots (91 miles per hour) from the south at Marquette, Mich., in May 1934; the shore-station values are subject to the condition that the free flow of the wind is diminished by land friction. The highest velocity as observed on anemometer-equipped vessels while more than 6 miles offshore was 81 knots (93 miles per hour) on June 25, 1950; but such records began in 1941 and self-recording data over a long period, which might register higher winds, are not available. The records of the Atmospheric Environment Service of the Canada Department of Environment (formerly Meteorological Branch of the Canadian Department of Transport) for near-shore areas of Ontario indicate the maximum wind speeds noted below in the sequence of station, speed, direction, date. These are sustained speeds over a one-hour period at airport locations (A) but one-minute averages at all other stations, and do not show maximum gusts which may be much higher. The speeds are in knots, with the value in miles-per-hour in brackets: Sault Ste. Marie A 48 (55) NW, Nov. 1963; Thunder Bay A 43 (50) NNE, Aug. 1967; Caribou Island 62 (71) W, Nov. 1946; Slate Island 52 (60) SE, Oct. 1971.

The area of greater frequency of fog, according to the reports of the United States National Weather Service, is east of Keweenaw Point and northward of Au Sable Point a district almost coincident with that of lowest water temperatures. Less fog is reported on the coast from Au Sable Point to Marquette and Portage Entry

Magnetic Attraction.—Local magnetic attraction, or disturbance of the compass needle, is more prevalent than on the other lakes. Reports of vessel masters agree that it is strongest at particular localities along the north shore, that it decreases in intensity as the distance from this shore increases, and that the tendency is to draw upbound vessels in toward the north shore.

Special observations were made in the fall of 1902 by the Corps of Engineers, for determining magnetic variations and local attraction over that portion of the head of Lake Superior lying west of Devils Island. Lines of observation were run across the lake perpendicular to its general direction, at intervals of 10 or 14 miles, between the following points: **Amnicon River and Lester River, Brule River and Stony Point, Flag River and Burlington Bay, Bark Bay and Gooseberry River, Sand Island and Beaver Bay, and Devils Island and Little Marais.** Other lines of observation run were as follows: **Devils Island to Duluth, Duluth to Sand Island, Duluth to Bois Brule River, Superior Entry to Stony Point, Duluth Canal to Superior Entry by way of lake and by way of harbor, Red Cliff (near Basswood Island) to Houghton Point (Chequamegon Bay), and lines skirting the north and south shores.**

These observations confirmed to a considerable extent the current reports as to local attraction along the north shore. The greatest local attraction found was near **Stony Point**, about 2 miles southwest of **Knife Island** and 18 miles from **Duluth**. Here where the normal variation was about 008° E. a variation was found as high as 026° E., showing a local attraction of 018°. This was near the shore on a straight line run from a buoy 200 feet out from the end of Stony Point, toward the south edge of Knife Island, with observations spaced about 200 feet apart. There were several maximum and minimum results on this line, occurring in the following order and amounts, all being east of north: 006°, 017°, 012°, 023°, 013°, 026°, 007°, 012°, 008°, 022°, 005°, 011°, 008°. The first is 1,000 feet west of Stony Point and the last 1,000 feet west of the west end of Knife Island. This indicates a number of magnetic foci of different intensities or different distances from the line of observation, and the spacing is not regular. The change from 026° to 007° occurs in a distance of 650 feet. Another line nearly parallel to the former and about ¼ mile farther from shore showed less change, the range of variation being within the limits of 009° and 022°. Another line which passed Stony Point at a distance of 7,000 feet, or 1¼ miles, and which passed Knife Island at a distance of 4,600 feet, gave variations between 008° E. and 013° E., being greatest in the vicinity of Stony Point, about 010° E. abreast Knife Island, 008° or 009° E. at intermediate points, and 008° E. east of Knife Island. On a line running southeasterly from Stony Point the local attraction disappeared at a distance of about 3 miles. It will be noticed that the local attraction generally draws the north end of the needle to the east in this locality.

Corundum Point showed the next greatest disturbance. Here at a distance from shore of about ¼ mile were found variations from 005° W.[1] to 017° E., a range of 022° or two points. At a distance of about 1¼ miles from shore the variation was from 004° E. to 009° E. The normal variation at this locality was about 006° E., and the needle was drawn strongly to the west at one point and to the east at another point. At the rate of decrease shown in going out into the lake, it is likely that the local attraction disappears at a distance of a very few miles from shore.

Near **Gooseberry River** (14 miles east of Two Harbors) and within 1 mile from shore, the needle was drawn from 005° to 008° to the east from the normal amount.

Near **Encampment Island** the needle was attracted 005°

[1] This is the only case of a west variation that was met with in the entire work.

to the east at two or more points about 2 miles from the island. There is less disturbance in Encampment Bay, west of the island. The observations were not sufficient for determining the limits of the disturbed area nor the maximum amount; and this remark applies to several other localities mentioned, as time did not permit a complete survey.

In the vicinity of the Palisades and the Baptism River, a line of observation run approximately parallel to shore and about ¼ mile away, and for a distance of 2½ miles, showed variations of 000° to 002° E., indicating a local attraction of 004° to 006° to the west; and at a point 1 mile west of Little Marais and ½ mile from shore was an attraction of about 004° to the west.

No considerable attraction was found within 6 miles east or west of Two Harbors, within the scope of the observations, contrary to certain reports, nor within several miles of Lester River.

Near French River and Talmadge River, 12 miles from Duluth and 1 mile from shore, the variation was as great as 015° E., showing a disturbance of about 007°. Near the base of Minnesota Point, north of the Duluth Canal, was found a large attraction to the east, but this was wholly outside the track of vessels.

The south shore of the lake from Superior to Devils Island, and at a distance of about 1 mile from shore generally, is free from any great attraction, as is also the line from Red Cliff (near Basswood Island) to Houghton Point (Chequamegon Bay).

In the body of the lake there was some attraction within 10 or 12 miles of Duluth, amounting to from 001° to 005° to the east of the normal variation, covering areas of several miles extent in certain directions. These are probably within the sound of Duluth and Superior fog signals and not likely to trouble vessels. Farther east the lines of observation running across the lake and from Duluth to Sand Island and Duluth to Devils Island developed no large attraction, but a few limited areas of 001° to 002° from the normal, and one of 004° to the east of normal 3½ miles from Gooseberry River.

The average variation on the vessel course from Devils Island to Duluth is not greatly different from that which would be taken from the NOS chart.

A partial test of the determined variations was made by running the *Vidette* from Devils Island (1½ miles off from the latter) to Duluth in thick weather by compass alone and disregarding the fog whistle when nearing Duluth. When within ½ mile of Duluth objects were sighted ahead showing that the vessel was heading 800 feet north of the Canal, equal to one-sixth of a degree error on the entire course. This course was figured with a variation of 006.3° E. for the first 30 miles from Devils Island and 008.2° E. for the remaining 38 miles, a mean true course of 251° and the proper deviation for the steamer's heading. The convergence of the shores makes the approach to Duluth something like entering a funnel, and an error of not many degrees in this course would throw a vessel over to the north shore, and a near approach to the shore might bring it within the local attraction which occurs at Stony Point, for example. Vessels which run near the north shore for protection from northwest storms may also feel some of the disturbance that is prevalent at several other points.

Vessel masters and owners on the lakes should give proper attention to the correction of the compass and the determination of the ship's deviation.[2] There is more reason for care from the fact that the directive force of the earth's magnetism is rather weak in this region as compared with other navigable waters of the globe and tends to sluggishness of the compass needle.

Magnetic observations over Lake Superior made by the Lake Survey in 1928 and 1929 showed irregularities around Isle Royale, also in an area about 22 miles south of Peninsula Harbor, a rather large area about 40 miles northwest of Au Sable Point, and an area around Stannard Rock.

Vessel masters have reported points of large magnetic disturbance as follows: Grand Marais, Pigeon Point, Pie Island, Welcome Islands, Thunder Cape, Point Porphyry, Magnet Island, Pic Island, and Peninsula Harbor, the disturbance being reported as great as 040° to 050° at Magnet and Pic Islands.

Improved Harbors.—Compared with others of the Great Lakes, Lake Superior was fairly well provided with natural harbors, and works of improvement have created additional harbors of refuge at various points. The harbors of Marquette, Mich., Presque Isle, Mich., Two Harbors, Minn., Silver Bay, Minn., Taconite Harbor, Minn., and Grand Marais, Minn., consist of bays of generally deep water, having wide mouths or openings toward the lake, which have been provided with breakwaters to close partially the natural openings and form the desired protection. At Whitefish Point, Big Bay, Keweenaw upper entrance, Black River, Saxon, Bayfield and Superior Entry, breakwaters have been built, forming stilling basins which are entirely artificial. Chequamegon Bay, on which the harbor of Ashland is situated, is protected from lake storms, but has so large an area that a breakwater has been built for protection against waves generated within the bay. Grand Marais, Mich., Grand Traverse Bay, Mich., Lac La Belle, Mich., Ontonagon, Mich., Cornucopia, Wis., Port Wing, Wis., and Duluth, Minn., have dredged entrance channels protected by parallel piers. At Portage Entry in Keweenaw Bay and at Knife River, the dredged entrance channels are protected by single breakwater piers. Little Lake has a dredged entrance channel protected by breakwaters. At harbors which required dredging to obtain depths suitable for navigation in the entrance and inner channels and basins, periodical dredging is necessary for maintenance.

Separate Steamer Lanes for Vessels.—The Lake Carriers' Association and the Dominion Marine Association

[2] Rules for correcting a true course for variation and deviation may be found in Bowditch's American Practical Navigator (for sale by Defense Mapping Agency Hydrographic/Topographic Center Office of Distribution Services and its sales agents) and in other treatises on navigation.

have prescribed, for vessels enrolled in the associations, the following separation of routes for upbound and downbound traffic in Lake Superior:

Downbound vessels shall lay a course from Duluth-Superior Harbor to pass not less than 12 miles off Devils Island Light, Eagle Harbor Light, Copper Harbor Light, and Manitou Island Light; thence to a point not less than 2½ miles off Whitefish Point Light; thence head 147½° to a point 2½ miles off Ile Parisienne Light and thence 138¾° to off Gros Cap Reef Light: *Provided*, That vessels leaving Superior Harbor shall lay their course 045° for 20 miles before turning on the course for Devils Island.

Downbound vessels from Taconite Harbor shall steer 082½° to a point 21½ miles north of Eagle Harbor, thence 112¾° to a point 12 miles 024° from Manitou Island Light, then 114° to the point 2½ miles off Whitefish Point Light.

Downbound vessels from Silver Bay shall steer 093½° to a point 12 miles north of Devils Island and there join the general downbound course on Lake Superior.

Downbound vessels from Ashland shall lay a course from South Channel to intersect the down bound course from Duluth 12 miles north of Eagle Harbor Light.

Downbound vessels from Marquette shall take departure from a point 076°, 2 miles, from Presque Isle Breakwater Light, and shall lay a course to pass not less than 7 miles off Au Sable Point Light, thence to pass not less than 7 miles off Crisp Point Light and continue same course to intersect the downbound course from Manitou to Whitefish Point. The foregoing may be accomplished from Presque Isle Harbor by laying a course of 076½° from Presque Isle Breakwater Light, and from Marquette by steering 030° for 3¾ miles to above point of departure, thence laying the 076½° course.

Downbound vessels from Thunder Bay (formerly Port Arthur and Fort William) Kaministikwia River Entrance shall take departure from a point not more than ½ mile 047° from Welcome Island Light, and shall lay a course 137° for 9 miles to a position not less than 2½ miles 227° from Thunder Cape.

From Mission River Entrance, vessels shall take departure from the Breakwater Pier Light, and shall lay a course of 110° for 2½ miles; thence 117½° for 8¾ miles to a position not less than 2½ miles 227° from Thunder Cape.

Vessels shall now lay a course 098° for 26 miles, passing not less than 2 miles 187° off Thunder Cape and passing not less than 1¾ miles 187° from Trowbridge Island Light in order to pass not more than 2½ miles off Blake Point Light abeam; thence 121° for 2 miles to a point not less than 1 mile 211° from Passage Island Light; thence 148° for 15 miles; thence 118¾° for 175½ miles to a point not less than 2½ miles 030° from Whitefish Point; thence joining the downbound course to Ile Parisienne.

Upbound vessels for south shore and western Lake Superior points shall lay a course from lighted bell buoy east of Point Iroquois 300° for 5 miles; thence 319° to a point 4 miles off Ile Parisienne Light; thence 328° to a point 1 mile off Whitefish Point Light; thence lay a course not over 280° to a point not more than 4½ miles off Crisp Point Light; thence to pass not more than 4 miles off Manitou Island Light and not more than 5 miles north of Copper Harbor Light, Eagle Harbor Light, and Devils Island Light and thence to destination.

Upbound vessels for Taconite Harbor shall follow the general upbound course on Lake Superior to a point 5 miles north of Copper Harbor, then steer 308¼° to a point 17 miles north of Eagle Harbor, then 261¼° to a point 25 miles north of Devils Island, thence to destination.

Upbound vessels for Silver Bay shall follow the general upbound course on Lake Superior to a point 5 miles north of Devils Island, then steer 288¾° for destination.

Upbound vessels for Ashland when 5 miles north of Eagle Harbor Light shall lay a course to pass 6½ miles off Michigan Island Light and thence to South Channel.

Upbound vessels bound for Marquette shall lay a course from a point not over 4½ miles off Crisp Point Light to pass not more than 4½ miles off Au Sable Light, thence to destination.

Upbound vessels for Thunder Bay (formerly Fort William and Port Arthur) shall take departure from a point ⅝ mile 293° from Gros Cap Light; thence steer 000° for 1½ miles; thence head on Whitefish Point Light, 318¾° for 8⅝ miles to a point 1½ miles 230° from Ile Parisienne Light; then 339¾° for 13 miles to a point 6 miles 065° from Whitefish Point Light; thence 300° for 192 miles to a point not more than ½ mile 211° from Passage Island Light; thence 310° for 3 miles; thence 277° for 26 miles, passing not more than ¾ mile 187° from Trowbridge Island Light, not more than 1 mile 187° off Thunder Cape and not more than ½ mile 170° off Hare Island Buoy; thence 319¼° for 8 miles to pass not less than 1 mile 048° from Welcome Island Light; thence to destination.

Vessels bound for Mission River Entrance, from the position not more than ¾ mile 187° off Hare Island Buoy, shall lay a course 292¼° for 8 miles; thence 290° to destination.

Vessels upbound to other points on the north shore of Lake Superior shall follow the courses as laid down from the Gros Cap Reef Light, to the position 6 miles 065° from Whitefish Point Light; thence to destination.

It is understood that masters may exercise discretion in departing from these courses when ice and weather conditions are such as to warrant it.

The recommended courses are designated on the general chart 14960, Lake Superior.

Limits of anchorage in Whitefish Bay are recommended as follows: From a point on the Birch Point range ½ mile above Gros Cap, 340° for 2½ miles; thence 314° to a point 2 miles off Ile Parisienne Light. From a point on the Birch Point range ½ mile above Gros Cap, 229° for ½ mile; then 300° for 2.7 miles; thence to a point 3½ miles off Ile Parisienne Light. No downbound vessel to proceed from this anchorage area unless authorized to do so by the U.S. Coast Guard.

DETAILED DESCRIPTIONS OF COAST LINE, HARBOR, ISLANDS, AND REEFS

Section I.—South Shore From Point Iroquois to Au Sable Point, Mich.

Charts 14884, 14962.—The areas from **Point Iroquois** to Whitefish Point forms **Whitefish Bay** to the northwest of the entrance to the St. Marys River. Point Iroquois is marked near its northerly end by the abandoned Point Iroquois Light white conical tower with attached dwelling. From this point the shoreline trend is westerly for about 19 miles thence northerly for about 20 miles to Whitefish Point, forming the south and west sides of Whitefish Bay. Buoy #47 in about 30 feet of water about three miles northwest of Point Iroquois Old Lighthouse marks the northerly edge of shoal water. **Mission Hill** with a high point over 400 feet above the lake and steep slopes on the north and east is about 2¼ miles southwest of Point Iroquois Old Lighthouse. A fire tower is located near the high point on Mission Hill.

Nadoway Point is about 2 miles west of Point Iroquois. The shoreline between forms a shallow bight with the southerly limit about midway between the points. **Iroquois Island**, a very low rocky island about ¼ mile long is about ¼ mile north of Nadoway Point. The 30 foot contour extends to a maximum of about 2¼ miles offshore around this point with depths over the rocky bottom of 15 to 18 feet at a mile off shore. From Nadoway Point the shoreline trend is south-southwest for about 7½ miles to the mouth of **Pendills Creek. Dollar Settlement**, mostly abandoned, is about 4 miles from the point. Between Dollar Settlement and Pendills Creek, the 30-foot contour is less than ½ mile off shore.

Chart 14962.—From Pendills Creek, the shoreline swings northwest for about 2¾ miles to Salt Point which is low and rocky thence west and northwest 4¼ miles to Naomikong Point. **Menekaunee Point** is about ½ mile west of Naomikong Point and a shallow bay is formed between the points. **Tahquamenon Island** is a small island about 3 miles north of Menekaunee Point and about 4 miles southeast of the mouth of the **Tahquamenon** River. From Menekaunee Point to about one mile south of the mouth of the **Tahquamenon River**, the shoreline curves to form **Tahquamenon Bay**. The 30 foot contour is about 1 mile offshore from Pendills Creek to Salt Point and extends across the mouth of Tahquamenon Bay from Salt Point, passing about 1 mile east of Tahquamenon Island. Depths of 6 feet or less are found over isolated shoals a mile north and a mile southeast of Tahquamenon Island and ½ mile east of Naomikong Point. A shoal with 6 feet or less extends about a mile north of that point and a large shoal with least depths of 2 feet extends 3¼ miles south of the mouth of the Tahquamenon River into Tahquamenon Bay.

The entrance to the Tahquamenon River is shoal and should be approached with care. In July 1966, a controlling depth of 3 feet was found in a channel leading easterly from the mouth of the river. The lower 16 miles of the river to the Lower Falls was navigable by small boat. In September 1963, a least depth of 3 feet was found about half way along this reach. The State of Michigan maintains a ramp on the south side of the river at its mouth. Fuel is available near the ramp. The shoal border inside the 30 foot contour is about 4 miles wide off the mouth of the Tahquamenon River.

From the river the shoreline extends almost due north for 9 miles to the mouth of the **Betsy (Shelldrake) River** and the shoal border decreases to less than a mile in width. The resort village of Paradise is about 4½ miles north of the Tahquamenon River. Ruins of two abandoned docks extend off the lakefront at the mouth of the Betsy River. From one mile north of the Betsy River to **Whitefish Point** the shore line extends to the northeast and may be safely approached to within ½ mile.

Whitefish Point Harbor, Mich.—This harbor, entirely artificial, is constructed about one mile southwest of the top of Whitefish Point and serves as a harbor of refuge for shallow draft vessels. The harbor is protected by breakwaters on the north, east and south sides forming a basin roughly 600 feet by 200 feet.

Channels.—The harbor is entered from Lake Superior through a dredged channel leading north then west between the breakwaters to the south end of the basin. In 1977, the controlling depths were 12 feet in the entrance except for shoaling to 7 feet on the west edge and 12 feet in the basin except for shoaling to 6 feet along the edges.

Aids to Navigation.—Whitefish Point Harbor North Breakwater Light, on a white column, is located at the south end of the north breakwater. Whitefish Point Harbor South Breakwater Light, on a white column, is located at the east end of the south breakwater. Whitefish Point Harbor Inner Breakwater Light, on a white pile, is located at the west end of inner breakwater. The breakwater lights are 25 feet above lake level.

Harbor Facilities.—The Michigan State Waterways Commission has constructed mooring piers connected to the north breakwater. The facility is capable of accommodating nine moored craft up to 60 feet in length. No electrical or water services, however, are available. In addition, the Commission has developed a launching ramp and parking area capable of accommodating 29 parked car-trailer units. Toilet facilities are also available.

The private dock of Brown's Fishery is about 300 feet south. Fuel is available in this harbor.

Whitefish Point Light, near the extreme tip of Whitefish Point and about 1 mile northeast of Whitefish Point Harbor, is 76 feet above the lake on a white skeleton tower with dwelling attached. The light station has a radio beacon and fog diaphragm horn.

A buoy, in 33 feet of water and about ½ mile north northeast of Whitefish Point Light, marks the north edge of shoal water off the point.

The shoreline extends westerly for about 20 miles from Whitefish Point to Little Lake Harbor, Michigan, and is

generally bold, but should be given a berth of about a mile to avoid the shoal water extending off from ½ to ¾ mile. None of the rivers which drain into the lake in this reach are navigable.

Crisp Point Light, 62 feet above the water, is shown from a white conical tower. It is located at the tip of Crisp Point about 14½ miles west of Whitefish Point. The buildings at the abandoned Coast Guard station at Vermilion Point, about 4½ miles east of Crisp Point, make a good land mark.

Wrecks.—Two wrecks are located in the vicinity of the Crisp Point Light. One is located about 2 miles east of the light, and ¼ mile offshore and the other is about 1 mile north of the light. No recent information is available regarding their character or condition.

Little Lake Harbor, Michigan.—This harbor, the only refuge in the reach from Whitefish Point to Grand Marais, Michigan, is located about 20 miles west of Whitefish Point and 29 miles east of Grand Marais. Little Lake which is roughly oval in shape is 2,800 feet long and 1,800 feet wide and separated from Lake Superior along part of its length by a low sand ridge about 300 feet wide and by higher bluffs along the remainder. There are depths of 18 feet or more over most of the lake with good water close to shore. A public dock is located near the easterly end of its northerly shore.

Channels.—A dredged channel leads from Lake Superior through a stilling basin between converging breakwaters and thence through the sand ridge into Little Lake. In 1977, the controlling depth in the channel was 5 feet along the west breakwater. The channel is subject to extensive shoaling.

Boat operators using the harbor are cautioned to use care in navigating the entrance area, and are advised that storm action may cause additional shoaling.

Aids to Navigation.—Little Lake Harbor of Refuge West Breakwater Light, 25 feet above the lake on a red steel column, is located at the outer end of the West Breakwater. Little Lake Harbor of Refuge East Breakwater Light, 20 feet above the lake on a black steel column, is on the outer end of the east breakwater.

Harbor Facilities.—A "T" shaped dock with its outer face about 135 feet long and 130 feet offshore has been constructed by the Michigan State Waterways Commission on the northerly shore of the harbor about 1,200 feet east of the entrance channel. In July 1970, there were depths of 6 to 7 feet off the dock. A small boat launching ramp and a vehicle parking area are located approximately 100 feet north of the dock. Gasoline and sewage pumpout facilities are available, but other facilities are very limited because of the isolated location of the harbor.

The stretch of 29 miles from Little Lake Harbor, Michigan, to Grand Marais, Michigan, has a westerly trend and continues bold. Depths of more than 30 feet can be found within ¾ mile of shore except for isolated shoals of 28 to 30 feet which reach about 1¼ miles from shore about 5 miles east of Grand Marais. There are no easily identified landmarks in this stretch.

Charts 14962, 14963.—Grand Marais Harbor, Michigan.—This harbor is located in West Bay about half way between Whitefish Point and Grand Island and 8 miles east of Au Sable Point. Except for Little Lake Harbor, it is the only harbor of any kind in this stretch of about 90 miles of dangerous coast, along which numerous wrecks have occurred, and is very useful as a harbor of refuge. The harbor basin is a natural deep water bay with a length of about 8,400 feet, parallel to shore and width varying from about 1,500 to nearly 2,200 feet, having an area of about 190 acres with a depth of over 18 feet with good anchorage. The village of Grand Marais, Michigan, is located around the southwest corner of the bay and its buildings, particularly the red brick school with chimney, aid in identifying the harbor.

The natural entrance to the harbor basin was near the easterly end of the bay but this entrance was closed with a pile dike constructed by the U.S. in 1891 and a new entrance and piers constructed by the U.S. The pile dike has been reinforced by riprap, but in 1977, was almost completely in ruins. It was not visible above water, leaving only some submerged piling which is extremely dangerous to any water craft. Sand has moved in through the breaks causing extensive shoaling in the east end of the harbor. Anchorage is advised in the western end of the harbor.

Channels.—A dredged entrance channel between parallel piers leads across the sand spit which separates Lake Superior and West Bay. In 1977, the controlling depth was 18 feet in the east half of the channel with depths decreasing to 15 feet at the west limit.

Aids to Navigation.—Grand Marais Harbor of Refuge Outer Light, on a white pyramidal skeleton tower located near the outer end of the west pier, is 40 feet above the water and has a fog-horn. Grand Marais Harbor of Refuge Inner Light, on a similar tower located near the inner end of the west pier, is 54 feet above the water and 2,610 feet 176°50′ from the outer light.

Harbor Facilities.—Arrangements can be made for minor repairs. There is no railroad connection or bus service.

The Michigan State Waterways Commission has provided a public docking facility located in the westerly section of the harbor which is operated by Burt Township. The dock provides water, electricity, lights, sewage pumpout facilities, gasoline, and launching ramp accommodations.

Coast Guard Station.—Grand Marais Coast Guard Station is located on the west side of the entrance channel.

The shoreline west of Grand Marais harbor entrance extends west southwest for about 7 miles and northwest about 1½ miles to the northerly tip of Au Sable Point which is marked by Au Sable Light about 107 feet above the lake on a white conical tower with a red dwelling attached and located about 57 miles west of Whitefish Point Light. The steep bluff of the Grand Sable area begins about 1 mile west of Grand Marais and extends along shore to within a mile of Au Sable Light. Grand Sable has elevations of 400 feet above the lake. The 30 foot contour is between ¼ and ¾ mile offshore in this section.

Section II.—South Shore From Au Sable Point to Big Bay, Mich.

Chart 14963.—The outer edge of a shoal extending northwest from Au Sable Point is located about 1 mile from Au Sable Light. Least depth on the shoal is a 6-foot spot ½ mile northwest of the light.

From Au Sable Light the shoreline trend is westerly for a mile, thence southwest for 16 miles and thence 1 mile west-northwest to the north tip of **Grand Portal Point.** The coast southwest of Au Sable is generally bluff with high points close to the shore and up to 100 feet above the lake to within 4 miles northeast of Grand Portal where the sheer exposed cliffs of the Pictured Rocks begin with elevations of over 100 feet. Except for shoals of 23 and 24 feet about ½ mile offshore and 3 and 4 miles, respectively, northeast of Grand Portal Point, there are no outlying obstructions along this coast.

Charts 14963, 14969.—Paralleling this coast is the east approach to Grand Island Harbor, Michigan, described below. The trend of this shoreline for the 10 miles between Grand Portal Point and Sand Point is southwesterly. The Pictured Rocks extend along the first 8 miles of this stretch with Sail Rock, 1 mile, and **Miners Castle Point,** 6 miles from Grand Portal, the most prominent points. South of the Pictured Rocks a high wooded bluff continues close to shore past Sand Point which is low and projects ½ mile northwest from the bluff. Thirty foot depths are available within ½ mile of shore and 6 foot depths close to shore along most of this reach. Two and one-fourth miles southwest of Miners Castle Point, a shoal area with a least depth of 2 feet begins to make out from shore. The outer extremity of the shoal is marked by a buoy located ⅓ mile northwest of Sand Point. The Pictured Rocks National Lakeshore is, established 6 Oct 1972, being developed along this reach.

Grand Island, Michigan, lies to the west of this reach. It is a bluff, wooded island about 7½ miles long, north and south, and 3½ miles wide, east and west, having much of its area over 100 feet above the lake. The easterly of two points on its north shore is about 9 miles west of Grand Portal Point and the shoreline near its southeast corner is less than ¾ mile northwest of Sand Point. Grand Island Light is on the westerly point on the north shore of the island. It is mounted on a white column with a white daymark and is on the bluff 190 feet above the lake. Trees to the west of the light obscure it from that direction and it is not visible on the course from Marquette. An abandoned lighthouse is about 200 feet southeast of the light. Except for shoals extending ½ mile off the north points of the island and off its easterly and southerly extremities, the island generally can be approached to within ¼ mile of shore.

The southeast portion of Grand Island, known as the Thumb, is high and roughly oval in shape. The Thumb is about 3 miles long and 1 mile wide and its long axis is parallel to the shoreline to the east. A low isthmus, 1 mile long and ½ to 1 mile wide, leads from its northwest side to the main island forming two bays. **Trout Bay** with an indentation of 1½ miles, is north and Murray Bay with an indentation of 1¼ miles, is south of the isthmus.

The easterly limit of shoal water off **Trout Point,** the northeast part of the Thumb, is marked by a buoy. Opposite Sand Point, the shoal border is narrow and marked by a buoy. The course of 217° through the natural deep water channel between the mainland and Grand Island into Grand Island Harbor is marked by the Munising Range in Munising, Michigan. An abandoned light tower is located on the southeast tip of the Thumb.

Charts 14963, 14969.—Grand Island Harbor, Michigan.—This deep water area lying south of Grand Island forms, during northerly storms, a refuge for the largest class of vessels plying the Great Lakes. The anchorage with good holding ground is to the south of Grand Island and east of the southerly point of the island and 1½ miles west of **Wick Point,** the southerly point of the Thumb. Murray Bay and South Bay are deep water areas contiguous with the harbor.

South Bay is bounded as follows: from Sand Point to Munising the shoreline extends about 3 miles to the southwest with a narrow band of low ground along shore. The shoreline extends northwest 1¼ miles along the waterfront of Munising and continues northeast and north for about 1½ miles to **Powell Point.** Outside the shoal water which reaches less than ½ mile offshore the depths are from 30 to over 200 feet.

There is also a deep water approach channel to the west and south of Grand Island. This west approach to Grand Island Harbor leads between Powell Point and the south tip of Grand Island which are ⅜ of a mile apart. Powell Point is deep-to while a shoal with width up to ½ mile and least depth of 3 feet extends off the southerly end of the island. A buoy ½ mile southwest of the southerly tip of Grand Island, marks the south corner of the shoal and a buoy ½ mile west of this buoy marks the turn into the harbor from the Bay Furnace Directional Light (formerly Grand Island Harbor Range).

Munising Harbor, Michigan, is located around the southwesterly end of South Bay. The city of Munising, Michigan, built on low ground at the foot of high bluffs, fronts on the harbor. The stack and tank of the Kimberly-Clark Corporation, near the southeast end of the city, are prominent landmarks when approaching the Corporations' coal dock. Lighted television and radio masts on high ground to the west of the city are very good landmarks.

Aids to Navigation.—The Munising Range Lights are located near the southwest end of South Bay and mark the channel east of Grand Island. The front light, 79 feet above the lake, is on a white conical tower near the junction of Hemlock Street and Munising Avenue; the rear light, 107 feet above the lake, is on a white conical tower 1,150 feet 217° from the front light.

Harbor Facilities.—The Anna River, which is not navigable even for small craft, flows into the southeasterly corner of South Bay. About 1,500 feet west of the Anna

River is the coal dock of the Kimberly-Clark Corp. The dock, about 700 feet long, is parallel to shore and had a depth of 14 to 23 feet reported alongside in August 1978.

About 1,000 feet northwest of the coal docks at the foot of Elm Avenue is the City Dock. This is an "L" shaped dock of steel and concrete construction with a 400-foot inner arm perpendicular to shore and a 300-foot outer arm extending to the southeast. Along the outside face of the outer arm, depths of 14 to 21 feet are available and around the remainder of the outer half of the dock, depths are greater than 6 feet. Limited dockage is available for transient craft. Fuel can be obtained by tank truck delivery and some repair facilities are available at local garages. Sewage pumpout facilities are available.

The ruins of a large dock, located about ½ mile northwest of the City Dock, extend 700 feet from shore. The outer arm of the ruin is on the line of the Munising Range.

A municipal launching ramp of the city of Munising was completed in 1965. The ramp, having a depth of about 2 feet at the outer end, is located on the westerly side of South Bay.

Medical Facilities.—Munising Hospital is located on the easterly side of South Bay about 1¼ miles northeast of the town.

Coast Guard Station.—Munising Coast Guard Station, seasonally operated, is in the town of Munising at the Munising Range Front Light. A radio guard is maintained during daylight hours, usually only on weekends and holidays.

From the north tip of Powell Point the shoreline is less bluff and extends southwest for 1 mile, thence westerly 1 mile to the village of **Christmas**, thence northwest about 3 miles to **Fivemile Point** and thence westerly for about 2½ miles to **Au Train Point**. The Bay Furnace Directional Light (formerly Grand Island Harbor Range is located near the center of **Bay Furnace**, the bight west of Powell Point. The Directional Light sectors show green from 171° to 168°; white from 168° to 166° and red from 166° to 163° with the recommended vessel course in the white sector. The line of the course passes through the deep water passage between Grand Island and the large shoal area which extends 3½ miles northerly and over a mile easterly of Fivemile Point, the point west of the island. **Wood Island** is near the outer end and **Williams Island** is 2½ miles southeast of the outer end and near the east edge of the shoal. There is a good passage between these islands to abreast of **Laughing Fish Point** on the course to Marquette except for a 10-foot detached reef 1½ miles off Au Train Point, this being the outermost patch of shoal water extending off this point. However, depths of 12 feet or less extend over ¾ mile off shore around Au Train Point.

Water Intake Pipeline.—An intake pipeline for the Kimberly-Clark Corp. Munising Mill commences 1,700 feet 122° from the east end of the city dock and extends 710 feet 358° to a crib with 44 feet over. It is not marked.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The intake pipe of the Munising Waterworks extends about 1,000 feet 325° from a point about ⅝ mile east of the Bay Furnace Directional Light to a crib in about 60 feet of water. There is a depth of 44 feet over the crib.

Chart 14963.—There are no landings in the reach of 29 miles between Au Train Point and Marquette Harbor, Michigan. From Au Train Point the shoreline extends southwesterly for 3 miles, then west 3¼ miles and northwest about 2 miles to form **Au Train Bay**. **Au Train Island** which is ¾ mile long and rises about 100 feet above the lake, has its south tip about one mile northeast of the northwest corner of the bay. The shoreline of the bay is generally low with hills and bluffs from ½ to 1½ miles back from shore. West of Au Train Bay, the shoreline continues low and extends westerly for about 2 miles, thence about 5 miles northerly. The area between this shore and Au Train Island is known as **Shelter Bay**. The shoreline around the southerly part of the bay is low, but bluffs rise along the westerly shore. From the northerly end of this bold shoreline the coast becomes low and extends west northwest 2 miles to Laughing Fish Point, the northerly projection in this section of coast.

West of Laughing Fish Point the shoreline is irregular and continues low, rocky, and with a trend southwesterly for about 5 miles to the mouth of the **Sand River**. It then becomes more regular and except for one projection, **Shot Point**, extends westerly for 12 miles to the mouth of the **Chocolay River**. The shoreline becomes more bluff and curves to the north in the remaining 3 miles to Marquette Harbor, forming Marquette Bay. Shot Point, which projects about 1 mile, is about 7 miles southwesterly of Laughing Fish Point.

Au Train Bay is deep and has a narrow shoal border except for that previously mentioned off Au Train Point and a spit with 12 feet near its outer end. This spit extends 1¼ miles northeast of the northwest corner of the bay to about ¼ mile southeast of Au Train Island. Another spit with 18 feet at its outer end extends over a mile north and a shoal with less than 12 feet extends ½ mile west of the island. There is 17 feet over a shoal about midway between Au Train Island and a promontory on the west shore of Shelter Bay. From the promontory to the northerly limit of the bay, the 30-foot contour is less than ¾ mile offshore. Depths of 24 feet or less are found almost a mile offshore from 2 miles east to 1 mile west of Laughing Fish Point, and the shoal border continues about ¾ mile wide from there to the Sand River. Except for a shoal area extending about 1 mile northeast from Shot Point and detached rocks, the shoreline can be approached to within ½ mile and has a sandy beach along most of the reach from Sand River to Marquette Bay. The detached rocks are at the edge of the shoal border about ½ mile offshore and extend for about 800 feet in a northwest-southeast direction with the northeast end exposed. The southeast end, which is nearly awash, is about 3,500 feet northwest of the mouth of the Chocolay River. A standpipe on Mount Mesnard, about 1½ miles south of Marquette Harbor, is about 500 feet above the lake and

forms a prominent landmark. The lighted radio masts of Station WDMJ-FM, about 3 miles west of the harbor, are also prominent.

Jettison Area.—An emergency External Stores Jettison Area has been established for K. I. Sawyer Air Force Base operations within the following coordinates: 46°40′49″ N., 87°08′32″ W.; 46°37′13″ N., 87°10′50″ W.; 46°38′48″ N., 87°16′04″ W.; 46°42′24″ N., 87°13′46″ W. The jettison area is an area of about 20 square miles northeast of Marquette, on a line between Grand Island to the southeast and Granite Island to the northwest. All vessels are requested to avoid this restricted area since use will be on an aircraft in emergency status basis and no advance announcement will be possible.

Charts 14963, 14970.—Marquette Harbor, Michigan.—This harbor, also known as Marquette Lower Harbor, is at the north end of **Marquette Bay** and, by steamer track, about 143 miles from the head of the St. Marys River. It is about 40 miles west of Grand Island harbor which is the nearest safe harbor to the east. The City of Marquette fronts on the harbor which is used for the shipment of iron ore, for receiving coal and petroleum products and as a base for commercial fishing.

Channels.—A breakwater extends south and southeast from the shore to protect a dredged basin. In 1974, the controlling depth in the basin was 26 feet except for shoaling along the edges.

Aids to Navigation.—Marquette Light, about 1,000 feet northeast of the north end of the breakwater and about 390 feet from the east end of the point north of Marquette Harbor, is 77 feet above the lake on a red square tower on a dwelling; a radiobeacon is operated at this station. Marquette Breakwater Outer Light, 40 feet above the lake on a white square pyramidal tower, is located at the southeasterly end of the breakwater; an air fog diaphragm is operated at the light; a red sector showing to the northeast on this light covers the shoal area east of Marquette Light. Marquette Breakwater Inner Light, 38 feet above the lake on a red skeleton tower, is located at the angle in the breakwater. About ½ mile 220° southwest of the Marquette Breakwater Outer Light, a buoy marks an 18-foot shoal area. Buoys, located 1,800 feet 262° and 1,800 feet 291½° west of the Breakwater Inner Light, mark the west limit of the harbor basin and two shoal areas.

A privately maintained buoy is south of the coal dock in 12 feet of water 3,075 feet 241° from Marquette Light and marks the northeasterly edge of shoal water.

Harbor Facilities.—The harbor contains one ore dock, two coal docks and two petroleum docks. A number of other docks are mostly in ruins. Most of these docks are along the west side of the harbor and are separated from the breakwater by the harbor basin which has good anchorage.

One coal dock is located along the west portion of the north side of the harbor and the other in the south portion. The ore dock extends from the west shore about 700 feet south. Depths of 20 to 24 feet are available along the northerly coal dock and 22 to 24 feet along the south side and 27 feet long the north side of the ore dock. The ruins of two docks extend from shore betweeen the coal and ore docks. **Ripley Rock**, a small rock island, is located about 200 feet south of the outer end of the ore dock. The inner portion of the dock ruins which extend out to Ripley Rock is used as an oil dock as is the inner portion of the remains of an ore dock about 500 feet south. Most of the latter dock has been removed, but a submerged ridge of fill stone 400 feet in length with a least depth of 8 feet remains at its outer end and is on line with and about 1,200 feet southeast of the oil dock structure. This ridge extends to the westerly limit of the dredged harbor basin and is marked at that point by the buoy which is about 1,800 feet west of the Breakwater Inner Light.

Vessels are not allowed to make fast to the breakwater and care should be taken in anchoring to see that they do not swing around against it. Limited emergency mooring and fuel are available for small craft along the northerly dock ruin and along the inner end of the slips to the north and south of this dock. Commercial fishermen and local boat owners operate from this area. A marine railway and ramp are available at the north side of the harbor about 1,000 feet west of the breakwater. Marine gasoline and repairs are provided in the harbor by local concerns.

Coast Guard Station.—Marquette Coast Guard Station is near the inner end of the breakwater, about 1,000 feet southwest of Marquette Light.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. An intake crib with a least depth of 55 feet is located 2,750 feet 104° from Marquette Light.

From Marquette Harbor to Presque Isle Harbor, a distance of about 2 miles, the shoreline trends to the northwest and is generally low and rocky. There are two detached rocks lying 1,400 feet 070° and 1,100 feet 103° from Marquette Light, with a rock nearly awash about 600 feet east of the light; a very shallow bank connects the southerly rock with the main shore, and extends about 600 feet to the eastward beyond it. In rounding the lighthouse point, marked with a buoy on the northeast edge of the shoal area, vessels should not approach closer than ½ mile from shore, to avoid this rocky bank.

Picnic Rocks, a group of small rock islands, are located just off a small point about ¾ mile north of the light. A stack just southwest of these islands and a plant and chimney about a mile northwest are prominent features along this coast.

Presque Isle Harbor, Mich., known also as **Marquette Upper Harbor**, also as **North Harbor**, is an indentation in the shore north of Marquette Harbor, and just south of Presque Isle Point, by which it is protected from northerly and, to some extent, from northeast storms. The bay is about 1½ miles long and extends into the shore about ½ mile; there being, over the greater part of this area, from 18 to 40 feet of water, with a hard sand, gravel, and boulder bottom.

Channels.—A breakwater extends southeast from the south end of Presque Isle Park to protect a dredged basin off the wharves at Presque Isle. In 1970, the controlling depths were 30 feet in the approach to the basin from Lake Superior with 28 feet in the basin.

Aids to Navigation.—Presque Isle Breakwater Light, 56 feet above the water on a white cylindrical tower attached to a white octagonal building, is located 60 feet from the outer end of the breakwater; an air diaphragm foghorn and a marker radiobeacon are operated at this light.

A buoy, located about 3,400 feet southwest of the end of the breakwater, marks the north edge of the shoal with a least depth of 3 feet on the south of the harbor basin and abreast of the Cliffs Dow Chemical Co.'s abandoned plant. A buoy west of the Presque Isle Breakwater marks the easterly line of the dredged harbor. A buoy north of the L. S. & I. R. R. dock marks the east edge of the narrow channel to the L. S. & I. R. R. Mdse. Dock.

Harbor Facilities.—The terminal facilities consist of one ore dock and a merchandise and petroleum wharf, both owned by the Lake Superior and Ishpeming Railroad Company. In November 1970 there was a controlling depth of 29 feet along the outer half and 28 feet along the inner half of the north side and 27 feet along the outer ¾ and 25 feet along the inner ¼ of south side of the ore dock. There was a controlling depth of 21 feet in the outer 400 feet of the slip on the southerly side of the merchandise wharf and recent dredging has provided depths of 20½ feet in the approach thereto.

In the fall of 1970, the city of Marquette and the Michigan State Waterways Commission completed a public docking facility northeast of the merchandise dock. Main piers extending from the northeast slope of the harbor with connecting floating finger piers provide dockage for recreational craft. The harbor is protected on the south by an east-west rubble mound breakwater. The mooring area was dredged to a depth of six feet.

Gasoline, diesel fuel, water, electricity, lights, sewage pump-out facilities, harbormaster service, and restroom and shower facilities are available at the public dock.

A launching ramp is along the north shore of the harbor.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. 1250.93 of Rules and Regulations, preceding. The intake pipeline of the Upper Peninsula Generating Co. commences from a point on shore 4,650 feet 283° from Presque Isle Breakwater Light and extends 1,300 feet 109° to a crib in 19 feet of water. There is a depth of 11 feet over the crib, which is marked by a private, seasonal lighted buoy.

Outfall Pipelines.—An outfall pipeline for the Upper Peninsula Generating Co. commences from a point on shore 4,650 feet 283° from Presque Isle Breakwater Light and extends 1,550 feet 131°. There is a depth of 15 feet over the outlet.

An outfall pipeline for the Upper Peninsula Generating Co. commences from a point on shore 4,650 feet 283° from Presque Isle Breakwater Light and extends 1,275 feet 131° thence 900 feet 182° and curving lakeward for 150 feet to an outlet with 18 feet over it.

Extending about 1 mile north of Presque Isle Harbor is a wooded rocky point, called **Presque Isle Point** with its northerly tip about 3¼ miles north of Marquette; along the east side there is deep water close to shore; small detached outcropping rock islands, known as **Presque Isle Rocks**, lie ⅝ mile to the eastward of the northern portion of the point, and a rock pinnacle with but 10 feet depth over it, lying in deep water about 1,000 feet east of the middle exposed rock, forms a dangerous outlying menace. Vessels passing this point bound northward out of Marquette Harbor should keep well outside of the exposed rocks, and by keeping the inner light on the Marquette breakwater well open with Marquette Light, clear to the eastward of the obstructions.

Chart 14963.—The coast from Presque Isle Point to Big Bay, Michigan, is a stretch of about 23 miles, with a northwesterly trend and generally bold. **Granite Point** is about 5 miles northwest of Presque Isle Point. The southeasterly half of the bight between these points is somewhat foul with a group of islands and scattered shoals extending to about a mile offshore. **Partridge Island**, the largest in the group and west of the group center is roughly ½ mile in diameter and has a height of over 200 feet above the lake. **Middle Bay** is to the southeast and **Partridge Bay** to the west of this island. Care must be taken in navigating these bays. The most dangerous shoal with 2 feet depth lies about half-way between the westerly side of Partridge Island and the mainland due west of the island. **Larus Island** is at the northwest limit of the area. The northwesterly half of the bight between Larus Island and Granite Point is deep-to.

Between Granite Point and **Big Bay Point**, which forms the east side of Big Bay, there are no outlying obstructions with the exception of Granite Island and Stannard Rock. **Garlic Point**, also known as **Thoney Point**, 4½ miles northwest of Granite Point, and **Yellow Dog Point**, 3 miles southeast of Big Bay Point, are prominent features along this coast which is backed by high hills and ridges. Also prominent are **Sauk Head**, 2¾ miles northwest of Garlic Point, and an un-named point, 3 miles southeast of Yellow Dog Point.

The coast from Granite Point to Big Bay Point can generally be approached with safety within ½ mile, except at a point about 1¾ miles northwesterly of Sauk Head, where the bank reaches about ¾ mile offshore, and at Yellow Dog Point where the bank extends out about ⅝ mile. **Garlic Island** lies close to shore midway between Garlic Point and Sauk Head.

Granite Island, with an area of about one acre, lies about 8⅞ miles north northwest of Presque Isle Point and about 5⅝ miles northeasterly of Garlic Point; it has steep shores with deep water surrounding. Granite Island Light, 89 feet above the lake on a square grey granite tower with dwelling, serves as a guide to Marquette Harbor from the northward and westward.

Stannard Rock, 33 miles 015° from Granite Island Light and 23½ miles 134° from Manitou Light, consists of two large, detached, rocky shoals. The southerly shoal runs in a southwesterly and northeasterly direction, with only a few feet of water over it. It was reported that in June 1956 a few scattered rocks were awash between this small rocky island and the lighthouse. The northerly shoal extends about 1,200 feet in a northwesterly and southeasterly direction and about 900 feet in a north

and south direction, with very scant depth; on this shoal is located Stannard Rock Light, 102 feet above the lake on a grey conical tower set on a cylindrical crib. Two detached rocky shoals are found in the immediate vicinity of the light; one is a 14-foot shoal lying about 1,000 feet southwesterly of the light; the other an 18-foot shoal, 3,600 feet west of the light, plainly to be seen from vessels passing over it in calm weather.

Section III.—South Shore From Big Bay to Keweenaw Point, Mich., Including the Keweenaw Waterway

Charts 14963, 14964.—Big Bay, about 2 miles wide, opens between Big Bay Point on the east and Salmon Trout Point on the west; it is about 12 miles east of the Huron Islands. At Big Bay Point, a shoal with only 9 feet depth near its outer end extends 1 mile northerly, its outer extremity marked by a buoy. Big Bay Point Light, on the northeast side of the point, is 69 feet above the lake on a white column attached to a dwelling. The south and west shores of the bay are deep-to within ¼ mile.

Big Bay Harbor, Mich.—This harbor of refuge is located in the southwest corner of Big Bay.

Channels.—A dredged entrance channel leads from deep water in Lake Superior between converging breakwaters to an inner harbor basin. In September 1978, the controlling depths were 9 feet in the entrance channel with 10 feet available in the basin.

Aids to Navigation.—Big Bay Harbor West Pier Light, on the outer end of the west breakwater, is 25 feet above the lake on a white column. Big Bay Harbor East Pier Daybeacon, on the outer end of the east breakwater, is 14 feet above the lake on a white column.

Harbor Facilities.—Marquette County and the Michigan State Waterways Commission have provided a public docking facility located in the southwest corner of the inner basin which is operated by the Marquette County Road Commission. The dock provides water, electricity, gasoline, sewage pump-out facilities, restrooms, showers, and a launching ramp.

About 700 feet northwest of the west breakwater are the ruins of an abandoned wharf about 530 feet long. The entire dock is submerged with depths of 3 to 9 feet over the ruins.

Chart 14964.—From Big Bay to Huron River Point, about 8 miles northwesterly, and thence westerly about 9 miles to the point at the southeast side of the mouth of Huron Bay, the shore is generally clear to within ½ mile, but off Huron River Point, a shoal having only 8 to 10 feet depth near its outer end, extends 1½ miles in a northeasterly direction and should be carefully avoided. This stretch is marked by the Huron Mountains. Conway Point, 2 miles, and Pine River Point, 4 miles northwest of Salmon Trout Point, are prominent. Pine River, about 1¾ miles southeasterly of Huron River Point, has cottages and a clubhouse, but no landing or shelter.

Huron Bay extends southwesterly about 12 miles, has a width of about 3 miles at its mouth, narrowing in the outer 5 miles to about a mile and to less than ½ mile at its inner end. It has deep water and generally clean shores, and on its northwest side, and separating it from Keweenaw Bay, is the peninsula terminating in Point Abbaye.

Huron Bay Light is at the outer end of a point about midway along the east shore of the bay just north of Skanee, Michigan. At Skanee, the old sawmill and wharves are dilapidated and abandoned. A submarine cable crosses the bay about 2½ miles southwesterly of Huron Bay Light.

Facilities.—Marina facilities are available approximately 1,000 feet south of Huron Bay Light where dredging has provided a basin 10 feet deep with 6 feet of water in the entrance leading to the basin. A ramp and gasoline are available.

The ruins of two wharves, mostly piles above water, are located on the east shore of the bay at the site of the abandoned village of Huron Bay. They extend about 1,000 feet off the mouth of the Slate River which is about 1½ miles from the head of the bay and near the southerly extremity of deep water. The two old wharves form a slip between them about 100 feet wide, but the available depth is less than 2 feet except at the extreme outer end. There is very shoal water on the outer sides of both wharves.

Point Abbaye Reef, with 6 feet least depth near its outer end in 1963, extends 1⅜ miles easterly from the northeast extremity of the point. At its outer end, the northerly edge of this shoal is marked by a buoy moored in 28 feet of water, 5 miles 276° from Huron Island Light and the southeasterly edge is marked by a buoy moored in 22 feet of water, ¾ mile southeasterly of the northerly buoy.

Huron Islands, lying from 2½ to 4 miles offshore near the entrance to Huron Bay, consist of two groups, both having very bold and clean shores except for several patches of rocks, awash, off the east end of the easterly group which is about 3½ miles northwest of Huron River Point. There is a deep channel 2¼ miles wide between the island and the mainland, also a passage ¾ mile wide and 100 feet in depth between the islands. Huron Island Light, 197 feet above the lake on a gray granite lighthouse tower is located on the northerly side of West Huron Island which is about 6 miles east of Point Abbaye. An air fog diaphragm horn is located about 1,750 feet 309° from the lighthouse tower.

Charts 14964, 14971.—Keweenaw Bay.—From Point Abbaye, this bay extends to the southwestward about 22 miles, being 12 miles wide at the entrance, with a minimum width of about 1⅛ miles abreast of Sand Point which projects from the west side about 2¼ miles from the head of the bay. The portion of Keweenaw Bay southerly of Sand Point is known as L'Anse Bay. About 12 miles southwest of the tip of Point Abbaye, a point or headland about 1 mile wide at its inner end and 2 miles wide at its outer end extends about 2 miles to the northwest. Sand Bay is to the northeast and Pequaming Bay to the southwest of this point. The Portage River enters the westerly side of the bay about 14 miles west of the tip of Point Abbaye and 12 miles north of Sand Point. The entrance to the river has been improved to form the Lower Entrance to the Keweenaw Waterway. The Keweenaw Peninsula with

its tip about 45 miles northeast of the entrance is described following the Waterway. Aside from the features described above, the coast of Keweenaw Bay is regular, its outlying waters are deep and unobstructed, and the shore line shoals vary in width from ⅛ to less than ½ mile. Radio masts southeast of L'Anse and northwest of Baraga are prominent and make good land marks.

Pequaming, Michigan, is situated on the north side of Pequaming Bay about 14 miles from Point Abbaye and about 8 miles from Portage River. Slab dock ruins extend about 1,200 feet south from the southwest tip of the headland which forms the bay and affords protection from westerly winds. There is a wharf in poor condition which parallels the east side of the dock ruins. The westerly side of the wharf is of slab construction and the easterly side of wooden pile and timber construction. In July 1966, the depths in the 60 foot wide slip west of the wharf ranged from 17 feet at its outer end to 7 feet at its inner end, and along the outer 500 feet of its east side, 19 feet of water was found. There are dilapidated mooring facilities on the east side. A small island, which is all that remains above water of the outer part of an old dock, is about 500 feet northeasterly of the wharf. Submerged log-boom cribs, widely spaced, extend from the island across Pequaming Bay nearly to the easterly shoreline. The cribs are in depths of 8 to 14 feet, are 500 to 1,000 feet from the shoreline of the northerly side of the bay, and do not encroach upon the anchorage area. Submerged ruins also extend to shore from the inner end of the island.

No facilities are maintained at Pequaming. There is excellent protection, but caution must be exercised in approaching and landing on dock ruins.

L'Anse, Michigan, is a village at the mouth of the Falls River near the southeast angle of L'Anse Bay. The development of the waterfront has provided a wharf and a Municipal Marina. There has been little commercial traffic in recent years. Prominent landmarks include an elevated silver water tank at the Celotex Plant which is just south of the river mouth and the stack at the power plant just east of the river mouth.

Harbor Facilities.—The Celotex Corp.'s wharf extends about 800 feet northwesterly from the mouth of the Falls River, and thence about 3,000 feet southwesterly along the shore. There is 19 feet of water at the northerly corner of the wharf, lessening to 12 feet near the intake structure about 300 feet southeast of the corner, and to about 2 feet at the mouth of the river. Along the lakeward or westerly side the deep water, with depths up to 22 feet, extends 2,800 feet southwest from the northerly corner, and thence the depths along the wharf diminish rapidly. In approaching the wharf, vessels should enter on a range parallel to and 75 feet away from the northeasterly face of the wharf. There is a 17 foot shoal about 600 feet northwest of the corner of the wharf. Submerged dock ruins which are dangerous to all vessels extend about 700 feet northwesterly from a point which is about 500 feet to the northeast of the corner of the Celotex Corp's wharf and 900 feet north of the mouth of the Fall River. A wreck is located just southwesterly of the submerged ruins. The outer end of the ruins is marked by a buoy.

L'Anse Municipal Marina is located on the southwest side of the point and about 600 feet north of the river mouth. Provided with steel sheet piling revetments and wooden docks, it consists of a 130 by 180-foot basin with a 50-foot wide entrance at its south corner. In August 1972, soundings showed a depth of 4 feet in the approach and a controlling depth of 4 feet in the basin. Fuel and most supplies can be purchased at the dock, or in the village. There is a hospital in L'Anse.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations preceding. A Potable Water Intake commences on shore at a point 5,750 feet 016° from the Upper Peninsula Power Co. Stack in L'Anse and extends 1,000 feet 270° to an unmarked crib in about 40 feet of water.

Sewer Outfall.—A sewer outfall pipeline commences on shore at a point 3,850 feet 002° from the Upper Peninsula Power Co. Stack and extends into the bay 1,030 feet 339° in about 16 feet of water. The end of the pipeline is not marked.

Baraga, Michigan, on the west side of L'Anse Bay, fronts on a well-sheltered bay formed under Sand Point. Two docks of slab construction and in fair condition, extend easterly from shore. One of these is the former Gitche Gumee Oil Co.'s coal dock, which is about 1,200 feet long, has ruins, mostly submerged, extending about 200 feet off its outer end and about 900 feet from its south side. About 175 feet north of the coal dock is the All-Wood, Inc. mill and wharf, the latter extending about 700 feet out to 18 feet depth. Two metal stacks at the mill are good landmarks. Commercial traffic includes occasional receipt of coal.

Harbor Facilities.—The north face of the coal dock, the only face suitable for mooring was, in 1978, in poor condition. A ramp is located near its inner end. There were depths of 17 to 7 feet in the slip between the docks in July 1972. Other facilities are available in the village nearby.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline commences at the shoreline 1,725 feet 179° from the post office at Baraga and extends 800 feet 121° into L'Anse Bay to a crib. There is a depth of 13 feet over the crib and it is not marked.

L'Anse Bay Shoal Buoy 2 is located in 12 feet of water 1,600 feet 199° from Sand Point Light and marks the southerly edge of a one foot shoal area extending south of Sand Point.

Sand Point Light, 35 feet above the lake on a red mast projecting from a small building, is situated on the easterly side of the point about 1,400 feet northwest of its southerly tip. The old light tower is located about 100 feet west of the light.

The village of **Keweenaw Bay** is on the west shore of Keweenaw Bay, opposite Pequaming and about 7½ miles

south of Portage River. An abandoned coal dock is in ruins and not now accessible.

Charts 14964, 14972.—Keweenaw Waterway, Mich., the waterway formerly designated the Portage Lake and Lake Superior Canals, is about 25 miles in length, crossing Keweenaw Peninsula from Keweenaw Bay on the southeast side to the open lake on the northwest side, including 5 miles in Portage River and its dredged cuts, 17½ miles in Portage Lake and 2¼ miles in the upper canal, from the head of Portage Lake to Lake Superior, excavated through what was formerly dry land at the northerly end of the route. Originally constructed by a private corporation, it was purchased by the United States in 1891.

On the vessel route between Sault Ste. Marie and Duluth, the distance through the Waterway is about 5 miles greater than by the open lake course. However, between Marquette and Duluth there is a saving of about 22 miles, and between Marquette and Ashland a saving of about 26 miles by the Waterway as compared with the route around the outside of Keweenaw Point. The use of the waterway for refuge is indicated by the fact that more freight passes through the canals in October and November, the stormy season, than at any other time in the year, although the commerce on Lake Superior, as shown by the records at the Sault and at the head of the lake is heaviest during July and August.

Numerous lights, ranges and buoys mark the channels in this waterway.

Channels.—The east entrance in Keweenaw Bay is protected by a breakwater extending southward from the east side of the mouth of Portage River. The dredged channel leads westward of the breakwater through Portage River, Portage Lake, and thence through the dredged canal connecting Portage Lake with Lake Superior. The entrance at Lake Superior is protected by converging breakwaters. The Federal project depths through the Keweenaw Waterway are 26 to 28 feet through the lower entrance at the mouth of Portage River, thence 25 feet through the river to the deep water in Portage Lake and from the upper end of the lake through the canal, and thence 26 to 32 feet through the upper entrance at Lake Superior.

The breakwater at the mouth of the Portage River is riprapped on the channel side, and it should not be approached closer than 20 feet by vessels exceeding a 12-foot draft.

Portage River Harbor of Refuge is just inside the waterway's lower entrance at the mouth of the Portage River.

The one-half-mile-long basin has a revetment with bollards on the west side where vessels may moor.

Portage River is the natural outlet of Portage Lake and forms part of the waterway across Keweenaw Peninsula. From the lake to the outer end of the breakwater at the mouth of the river is a distance of about 5 miles.

In 1966, the controlling depth in Portage River was 24 feet. In 1975, the controlling depth in the harbor of refuge was 24 feet except for shoaling to 22 feet in the southeast corner and shoaling to 19 feet along the mooring pier on the west side.

Aids to Navigation.—Keweenaw Lower Entrance Light, 68 feet above the lake on a white octagonal tower, is located on the pierhead at the outer end of the breakwater pier; a fog diaphragm horn is operated at this station. A buoy marks the west side of the entrance channel opposite the light station. Suitable aids mark the channel into the harbor of refuge and through the Portage River.

Harbor Facilities.—A small settlement with docks of commercial fishermen is on the west side of the river entrance, south of the mooring pier. Fuel, limited dockage, repair facilities, launching ramp, and marine railway are available. At the north end of the mooring pier, the U.S. constructed a recreational area with facilities including picnic tables, potable water supply, toilets, and a small boat launching ramp.

Portage Lake is 17½ miles long, generally narrow and resembling a river, but without sensible current. The southeasterly portion of the lake (known locally as Big Portage) is over 2 miles wide, east-west. The Portage River outlet is at its southeast corner and Pike Bay at its southwest corner, divided by flats at the mouth of the Sturgeon River. About 3 miles north of its south end, the lake is divided by Grosse Point with Torch Bay extending about 3 miles to the northeast and the main portion of the lake narrowing to about ½ mile and extending north about 2 miles before turning west around Pilgrim Point. The village of Dollar Bay is on the north shore at the turn. The lake extends west for about 5½ miles, passing between Hancock and Houghton which are the principal communities on the waterway and are, respectively, on the north and south shores. It then extends northerly for about 4½ miles to its junction with the canal. In the reach from Pilgrim Point to the canal the lake has a minimum width of about ¼ mile. Being on the slope of high bluffs, buildings in Hancock and Houghton are prominent. There are radio masts on the heights back of the towns. Some of the masts are lighted and visible from Lake Superior.

Channels.—In 1977, the channel through the lake had a controlling depth of 25 feet.

Aids to Navigation.—The channel is well marked by lights and buoys. The middle ground south of Grosse Point, where the depth is only 9 feet, is marked at its extreme southeast end by a buoy.

Pike Bay.—There is an available channel about 100 feet wide, with depth of 9 feet or more during the navigation season, leading up to the pile remains of the old lumber wharf at Chassell, on Pike Bay, at the southwesterly end of Portage Lake.

Wreck.—The Steamer Charles H. Bradley, 201 feet long, 37 feet beam, 13½ feet deep, burned October 8, 1931, and now lies in from 6 to 17 feet of water in the southerly end of Portage Lake, off the mouth of Sturgeon River, about 650 feet west of the vessel course and 650 feet southwest of a buoy marking the outer entrance. During high stages, the wreck is entirely below water.

Torch Lake and Canal are tributary to Torch Bay and

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lie northeasterly of Portage Lake. Torch Lake is about 5 miles long and 1½ miles in greatest width, with a maximum depth of 123 feet. On the northwesterly shore of the lake are the towns of **Lake Linden** and **Hubbell**, with stamp mills, reclamation plants and copper-smelting works. For several years, extensive stamp sand deposits along the westerly shores of the lake were in the process of being removed for reprocessing and redeposit into the lake causing a continuing change in the shore line and depths. These reclamation operations ceased prior to 1970.

Torch Lake was originally connected with Torch Bay by a narrow circuitous channel. A canal about 4 miles long on a rectified line was subsequently dredged by private interest but has not been maintained since 1974.

Soundings in June 1972 showed that the canal channel was suitable for vessels drawing 19 feet.

Houghton—Hancock Bridge.—There is a vertical lift, combined highway and railway bridge across Portage Lake, connecting the city of Hancock and the city of Houghton. The double deck lift span provides a horizontal clearance of 250 feet, a vertical clearance of 7 feet when closed and 103 feet when fully raised, both distances above high water, which for this bridge is 3.3 feet above Low Water Datum. The lift span may be stopped at intermediate elevations with vertical clearances above high water indicated opposite a pointer on the lift span. Fixed red lights are shown on top of the lift span towers and a fixed white light is shown at center of top of lift span. A light at center of bottom of lift span shows red and is changed to green when lift is raised sufficiently for passage.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding, and 33 CFR § 117.642 published in Rules and Regulations, preceding.

Harbor Facilities.—There are facilities for receiving coal and petroleum at Dollar Bay, coal at Houghton, and Hancock on Portage Lake, and at Hubbell on Torch Lake. The National Park Service maintains a dock at Houghton for ships carrying supplies and passengers to Isle Royale National Park. Docks along the waterfront of Houghton are in good condition, but most of those at Hancock are becoming ruins. Some dock space for small boats is located at the village of **Ripley**, between Dollar Bay and Hancock; ramps are located just east of the bridge on the Hancock waterfront and on the east side of the lake about a mile south of the canal. There are two large hospitals at Hancock.

The Michigan State Waterways Commission, and the County of Houghton, have constructed a recreational marina having docking and launching facilities just east of the bridge along the north side of the waterway. Water, electricity, diesel fuel, sewage pumpout facilities, gasoline, and other services are available.

Wreck.—A 40 by 90-foot wreck of a barge, located 1,150 feet 216° from Lily Pond Leading Light, lies perpendicular to and 200 feet west of the channel edge. It is at about Low Water Datum and unmarked.

Keweenaw Upper Entrance and Canal.—The Upper Entrance and Canal of the Keweenaw Waterway are entirely man-made.

Channels.—The dredged canal from the upper end of Portage Lake to Lake Superior is about 2¼ miles long. In 1973–1974, the controlling depth through the canal was 22 feet.

Lily Pond Harbor of Refuge, about 0.6 mile above the upper end of Portage Lake, has a revetment fitted with bollards on the east side where vessels may tie up.

From the harbor of refuge to Lake Superior, the canal is revetted on both sides. However, vessels are not permitted to tie up to these revetments.

Aids to Navigation—Keweenaw Upper Entrance Light, 82 feet above the lake on a white square tower, is on a detached crib at the outer end of the east breakwater; a foghorn operates at this station. Keweenaw Upper Entrance West Breakwater Light, 32 feet above the lake on a white skeleton tower, is on a detached crib at the outer end of the west breakwater.

Keweenaw Upper Entry East Revetment Light 72, on the east side of the channel at the junction of the stilling basin and the upper canal, is 26 feet above the lake on a white skeleton tower. West Revetment Light, on the west side of the channel opposite Keweenaw Upper East Revetment Light 72, is 32 feet above the lake on a white skeleton tower. A radiobeacon is operated on the east bank of the canal entrance.

Harbor Facilities.—Aside from the mooring pier at the Lily Pond Harbor of Refuge, there are no facilities at the Upper Entrance and Canal.

Isle Royale Ferry Service.—During the summer months from about June 15 through Labor Day, the National Park Service ship, M/V Ranger III, travels a course of 004° from Keweenaw Upper Entrance to Rock Harbor Light on Tuesday and Friday. The course for the ship is 184° from Rock Harbor Light to Keweenaw Upper Entrance on Wednesday and Saturday.

Coast Guard Station.—Portage Coast Guard Station is on the east bank of the upper canal, about 0.8 mile southeast of the breakwater entrance.

Navigation Regulations.—See 33 CFR § 162.115 and § 207.410 of Rules and Regulations, preceding.

Chart 14964.—Proceeding from the Keweenaw Lower Entrance 15 miles northeasterly to **Traverse Point**, the headland separating **Little Traverse** and **Grand Traverse Bays**, the shore can be approached to within ½ mile. **Traverse Island**, 4½ miles southwesterly of Traverse Point and 2 miles offshore is roughly triangular in shape with ½ mile long sides; it has a narrow, shallow spit extending ¾ mile in a southwest direction from its narrow southwest point. In July 1966, there existed a small gravel island, about 100 feet by 25 feet and 3½ feet above the water, about 500 feet northeast of the southerly limit of the 6-foot contour of the spit. The other shores should be given a berth of from ⅛ to ¼ mile. Good water is found in the passage, 1¾ miles wide, between Traverse Island and the main shore.

Little Traverse Bay, roughly a 2 mile diameter semicircle, affords protection from west to northeast and has a sandy bottom. Grand Traverse Bay, about 4½ miles wide with an indentation of about 1½ miles, is bounded on the north by a low point near the village of Gay, Michigan,

and affords protection from westerly winds; a shoal extends over a mile offshore in the northerly corner of the bay with depths of 14 feet near its outer edge. A tall stack, all that remains of a plant at Gay, is a very prominent landmark.

Grand Traverse Bay Harbor, Mich.—A shallow draft harbor is located near the center of the westerly shore of Grand Traverse Bay at the mouth of the Traverse River about 18 miles northeasterly of Keweenaw Lower Entrance and about 3 miles north of the northeast tip of Traverse Point. The principal use of this harbor is as a base for commercial fishing tugs.

Channels.—A dredged entrance channel leads from deep water in Grand Traverse Bay between breakwaters at the mouth of Traverse River to an inner harbor basin. An extension channel leads northeast from the inner basin upstream in the river for about 150 feet. In September 1978, the controlling depths were 12 feet in the approach, thence 12 feet between the breakwaters, and thence 10 feet in the basin and extension channel.

Aids to Navigation.—Grand Traverse Bay Harbor Light 2, on the outer end of the north breakwater, is 38 feet above the water and mounted on a white skeleton tower. Grand Traverse Bay Harbor Light 3 is on the outer end of the south breakwater, 27 feet above the water, and mounted on a steel pile.

Harbor Facilities.—This harbor is extensively used by fishing tugs with very limited facilities for recreational small craft. No dockside facilities for marine repair or maintenance are available and the nearest store is about 5 miles by road at the village of Gay, Michigan.

The Michigan State Waterways Commission has constructed a mooring facility at the turning basin approximately 1,000 feet upstream from the pierhead light. This facility can accommodate approximately 4 craft moored broadside. A boat ramp is available.

In 1965, the ruins of an old coal dock were reported extending about 150 feet into Lake Superior from the north shore of Grand Traverse Bay. The ruins are located approximately 10,000 feet 044° from Grand Traverse Bay Harbor Light. The structure is reported to be 1½ feet under water.

From Grand Traverse Bay to Bete Grise Bay, the trend is northeasterly and the distance about 20 miles. Care should be exercised in approaching the coast in this reach to avoid the shoal water extending out in some places nearly ¾ mile. At Point Isabelle, which forms the southerly shore of Bete Grise Bay, the shoal rocky bank reaches out ⅞ mile to the northeast, the outer end being marked by a buoy in 32 feet of water, 2 miles 123° from Lac La Belle South Pierhead Light.

Bete Grise Bay is an indentation about 2 miles deep and is about 3 miles wide at its mouth and 2 miles wide at its head. The southerly shore is low and rocky, the westerly shore low and sandy and the northerly shore bluff and rocky. Mt. Houghton; just north of the bay, and Mt. Bohemia, about 3 miles west, are prominent peaks. There is a fire tower on top of Mt. Bohemia.

Lac La Belle Harbor, at the head of Bete Grise Bay about 37 miles from the Keweenaw Waterway southern entrance, consists of a canal connecting Bete Grise Bay and Lac La Belle, a small inland lake about 2½ miles long, 1 mile wide, and up to 37 feet deep. The canal, about ¾ mile long, was first cut through in 1866 to replace a shallow circuitous natural river route. It was later abandoned, but was restored by the U.S. Government in 1960. An abandoned lighthouse is on the south side of the channel about 1,000 feet west of the entrance.

Channels.—The canal is entered between parallel piers at its mouth in Bete Grise Bay. In 1977, the controlling depths were 11 feet in the approach, thence 10 feet between the piers, and thence 10 feet in the canal to natural water in Lac La Belle.

Aids to Navigation.—Lac La Belle South Pierhead Light, 25 feet above the lake on a white column, is located on the outer end of the South Pier. Lac La Belle North Pierhead Light, 25 feet above the lake on a white column, is located on the outer end of the north pier.

Harbor Facilities.—The area surrounding this harbor is largely unpopulated except during the summer. A few commercial fishing tugs work out of the harbor, however facilities for recreational craft are limited. Local interests and the Michigan Waterways Commission have constructed a dock for small craft at the northeast end of a small bay at the northwest corner of Lac La Belle. Fuel, ramps and provisions are available near this municipal dock.

The coast in the reach of 12 miles from Bete Grise Bay to Keweenaw Point, trends easterly and is bold and deep-to, with a few exceptions. Elevations of 500 to 600 feet above lake level characterize the area adjacent to the coast.

A boulder shoal nearly awash makes out from Keweenaw Point, the easternmost extremity of the peninsula, for about ½ mile in a southeast direction with its outer edge marked by a buoy in 30 feet of water.

Manitou Island, with its west edge about 3 miles easterly of Keweenaw Point, extends 3 miles in length in an easterly direction and is about 1¼ miles in maximum width. Rocky shoals extending about ¼ to ¾ miles offshore border the island.

Manitou Light, 81 feet above the lake on a white cylindrical tower, is on the easterly point of the island. A fog signal, radiobeacon, and radar transponder beacon (RACON) are at the light. (See Light List for details.)

Between Keweenaw Point and Manitou Island there is a deep passage 1¾ miles wide. Gull Rock Light, 50 feet above the lake on a yellow square tower with dwelling attached, is at the extremity of a rocky flat extending ¾ mile from the west end of Manitou Island and serves as a guide through this passage. A dangerous gravelly shoal with 12 feet least depth, ⅞ mile 177° from this light, is marked on its westerly side by a buoy. A boulder shoal, over which the least depth is 26 feet, lies 1 mile due south of Gull Rock buoy.

Good lees from west thru north to northeast winds can be found with good holding ground in **Fishermans (formerly South) Bay** on the southeast shore of Manitou Island as well as **Keystone Bay**, immediately west of Keweenaw Point, and Bete Grise Bay.

Section IV.—South Shore From Keweenaw Point, Mich., to Chequamegon Point, Wis.

From the tip of Keweenaw Point the shore line trends northward for 2¾ miles before turning northwest and gradually curving to the west in the 7½ miles from the turn to Copper Harbor entrance. The coast is deep-to and generally low and rocky in this reach with high bluffs a short distance back from shore.

Copper Harbor, Mich., is situated at the most northerly part of the Keweenaw Peninsula. It is a snug harbor, 3 miles long and of 1,700 feet average width. Around Keweenaw Point great storms come from the northeast and northwest, and against these the harbor affords protection from the waves.

Aids to Navigation.—Copper Harbor Light, 90 feet above the lake on a white square skeleton tower, is located on the east point of the harbor entrance. An abandoned lighthouse is just east of the light.

The Copper Harbor range of lights is located on the south shore of the harbor.

The approach to the entrance is marked by a buoy located about 3,500 feet 010° from the front range light.

Harbor Facilities.—The water is generally deep, with good holding ground at the west end, there being an area of about 320 acres with more than 18 feet depth. The available depth over the ridge at the harbor entrance is about 14 feet on the range.

Wharves in the harbor are concentrated on the south shore near the westerly end and consist of fish docks and small boat landings. Vessels seeking shelter in northeast storms should go to anchor near the west end of Porter Island, where the best holding ground in the harbor is to be found.

The Michigan State Waterways Commission has provided a public docking facility on the south shore in the westerly end of the harbor. The facility is operated by the Keweenaw County Road Commission. The dock provides water, electricity, lights, gasoline, sewage pump-out facilities, restrooms, showers, and a launching ramp.

Several detached shoals in the harbor are hazardous to navigation notably a shoal with least depth of 12 feet, 1,100 feet 176° from Copper Harbor Light.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake is located about 50 feet off shore at the foot of 3rd Street in Copper Harbor. The intake is not marked.

Ferry Service.—The Isle Royale Queen II is operated Monday and Friday from mid-May until mid-June and daily except Sunday from mid-June through Labor Day in passenger service to Isle Royale National Park. The course from Copper Harbor Light to Scoville Point on Isle Royale is 330°. The return trip is on the same route on a 150° course.

From Copper Harbor to Agate Harbor, a reach of 8 miles with a westerly trend, the coast is deep-to and may be approached to within ¼ mile. From Agate Harbor to Eagle Harbor, a reach of 5 miles trending westerly, a succession of dangerous rocks and reefs parallel shore about ¼ to ½ mile out. Little Grand Marais Harbor is about midway in the latter reach.

Agate Harbor consists of a north and a south harbor parallel to each other and open to the westward, inclosed by two narrow peninsulas which extend westward from the mainland, and by islets and reefs which extend still further westward from the ends of the peninsulas. These harbors afford safe shelter and good holding ground for small craft. Extreme caution must be exercised to avoid reefs. No lights or ranges are maintained. The maximum available depth across the outer line of shoals at the entrance to the north harbor is 19 feet.

A shoal blocks the entrance to Little Grand Marais Harbor which is open to the north and almost completely landlocked.

Eagle Harbor, Mich.—A partly inclosed indentation in the north face of Keweenaw Peninsula, closely approximating a rectangle, in which the length trending with the shore measures about 4,900 feet, and the width about 1,150 feet. The area of possible anchorage ground, having a depth of from 14 to 20 feet, is 33 acres. The general character of the bottom within this area does not give the best holding ground. The shores in the vicinity are rocky and bold, and dangerous to approach during northerly gales. Outside the entrance, at a distance of 1,000 feet therefrom, there is a reef upon which a minimum depth of 2 feet is found. Large commercial vessels do not enter Eagle Harbor or remain there when a storm is imminent, however, small craft facilities are available.

Channels.—A channel has been dredged between two partially submerged cribs from Lake Superior to the deep water inside the harbor, and a basin has been dredged off a boathouse at the east end of the harbor. In 1975, the controlling depths were 12 feet in the entrance channel and 11 feet in the basin with 8 feet along the revetment and boathouse on the north side of the basin.

Aids to Navigation.—Eagle Harbor Light, 60 feet above the lake, on a white octagonal tower is on the west point of the entrance; a radiobeacon is at the light.

The entrance range is marked by lights, on the south shore of the harbor and leading between the U.S. cribs.

Harbor Facilities.—The Michigan Waterways Commission has constructed a dock and ramp on the north side of the harbor basin and has provided restroom and shower facilities at this location as well as water, electricity, gasoline, sewage pumpout and dock attendant services to watercraft at the dock.

The trend of the shore line in the reach from Eagle Harbor to Keweenaw Upper Entrance is 28 miles southwesterly. The coast is generally bluff and may be approached close to with the exception of several shoals. The coast for the 7 miles from Eagle Harbor to Eagle River has a succession of dangerous shoals paralleling shore from ¼ to 1 mile out. Great Sand Bay is an indentation extending from 3 miles west of Eagle Harbor to a mile east of Eagle River. Eagle River Shoals, a narrow band of shoal water, parallels the shore almost a mile

off from abreast of Eagle River eastward across the mouth of Great Sand Bay. It is about 4 miles in length with a least depth of 4 feet.

Eagle River is abandoned as a commercial port and the cribs of the old dock are submerged. Buildings in the village and a resort at the shore aid in identifying the site.

About 5¼ miles southwesterly of Eagle River there is a detached rocky reef, called **Hutchinson Shoal**, with least depth of 14 feet and about 60 feet by 200 feet in size on the 20-foot contour. It is ½ mile from shore and out of the usual course of vessels. An abandoned lighthouse on a point (Sand Point), about a mile east of the shoal, is a prominent landmark. At a point 1 mile northeasterly of the Keweenaw Upper Entrance, a spit extends ¾ mile to the north, with but 8 feet of water well toward its outer end, and must be carefully avoided in entering or leaving the canal.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake, located 7 miles northeast of the Keweenaw Upper Entrance Light, is 900 feet from shore and has 10 feet of water over its submerged crib.

A potable water intake, located 5¼ miles northeast of the Keweenaw Upper Entrance Light, is 1,000 feet from shore and has 13 feet over its submerged crib.

Charts 14964, 14965.—From the Keweenaw Upper Entrance the shoreline trend is generally southwest for about 42 miles to Ontonagon Harbor. None of the rivers entering the lake in this reach are navigable nor are there any landing or dockline facilities along the coast. Stacks near shore at **Redridge** and **Freda** are about 8 and 10½ miles, respectively, southwest of the Upper Entrance and are prominent landmarks.

Chart 14965.—From Freda the shore has a more southerly direction for about 10 miles thence westerly about 8 miles past **Willard Point** to **Fourteen Mile Point. Carvers Bay**, also known as **Misery Bay**, just easterly of **Willard Point**, and **Sleeping Bay** between **Willard Point** and **Fourteen Mile Point** offer limited protection. An abandoned house and light tower on Fourteen Mile Point, 13 miles northeast of Ontonagon Harbor, is readily visible from lakeward and makes a good landmark.

Ontonagon Harbor, Michigan.—This harbor is at the mouth of the **Ontonagon River**, and is the only refuge for small craft between Keweenaw Upper Entrance and Black River Harbor, a distance of about 81 miles. The entrance is protected by parallel piers. Prominent landmarks include a blue elevated tank, stacks and buildings at the paper company which is on the west side of the river about ¾ mile south of the entrance and a blue elevated water tank located on the east side of the river about 1¼ miles southeast of the entrance. A highway bridge crosses the river about 1,000 feet upstream from the piers and a railway bridge about 2,200 feet is further upstream.

Channels.—A dredged entrance channel leads from deep water in Lake Superior between the parallel piers to the mouth of Ontonagon River, thence upstream for about 0.4 mile to just below the Ontonagon Street bridge. In August 1978, the controlling depths were 17 feet in the approach channel, thence 15 feet through the piers and the river mouth, thence 10 feet to the bridge. Shoaling in the harbor occurs annually during the winter.

Aids to Navigation.—A buoy, located 1,230 feet 337° from Ontonagon Harbor West Pierhead Light, is on the recommended course into the harbor entrance to mark clearance around the deteriorated East Pierhead. The harbor entrance is marked at the outer end of the west pier by the Ontonagon Harbor West Pierhead Light which is shown on a white skeleton tower with upper part inclosed, 31 feet above the water. The outer end of the east breakwater is marked by the Ontonagon Harbor East Pierhead Light which is shown on a white column about 25 feet above the water.

Harbor Facilities.—This harbor is used extensively by commercial fishing craft, and to receive oil and coal. Facilities for transient docking are located along the easterly side of the harbor. Medical services are available at the Ontonagon Memorial Hospital in the village.

The village of Ontonagon and the Michigan State Waterways Commission completed a public docking facility in the fall of 1970. The entrance is located approximately 1,000 feet upstream of the M-64 bridge on the southwest side of the Ontonagon River.

The facility consists of a boat basin dredged to a depth of 7 feet in 1970. A main pier extending from the southwest slope with connecting finger piers provides dockage for recreation craft.

Gasoline, water, electricity, lights, sewage pump-out service, harbormaster service, and restroom and shower facilities are available at this facility. In addition, a 30-ton hoist is located in the basin.

Several launching ramps are on the southwest bank of the river approximately 500 feet upstream of the boat basin entrance.

Bridges.—A highway bridge crosses Ontonagon River about 900 feet above the inner ends of the piers. There is a draw span over the main channel, with horizontal clearance of 30.5 feet for the east opening and 31.5 feet for the west opening, and clear height of 7.8 feet above low-water datum. The signal for opening the draw is 2 blasts, 1 long, 1 short (— –).

About 2,200 feet above this bridge a railroad bridge crosses the river, having three main spans, each 108 feet long and 8 feet in clear height above low-water datum. There is no drawspan.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding, and 33 CFR § 117.641 of Rules and Regulations, preceding.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline of the village of Ontonagon commences at the intake structure on the shoreline 2,175 feet 185.7° from Ontonagon Harbor West Pierhead Light and extends 3,000 feet 317° to an intake in 38 feet of water. There is a depth of 27 feet over the intake which is not marked.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake for the village of Ontonagon is located from a point on shore 3,135 feet 200° from the West Pierhead Light and extends 3,200 feet 313° to a crib with least depth of 36 feet over.

From Ontonagon the coast runs in a southwest direction for about 6 miles to the settlement of Green, thence westerly for about 15 miles and thence southwesterly about 18 miles to Black River Harbor. The coast is relatively low with shoal water extending about ¾ mile offshore between Ontonagon and Silver City, a settlement at the mouth of the Big Iron River and about 14 miles southwest of Ontonagon.

About 2 miles west of Silver City and extending west and southwest along shore for about 15 miles are the Porcupine Mountains, with some elevations 1,200 feet feet above the lake. From Ontonagon to the Porcupines the shoal border is up to ¾ miles wide. A small island of solid rock, projecting about 20 feet above the lake and located about 1,000 feet offshore, is situated about 14 miles northeast of the Black River. Aside from this island which is shown as a rock above water on the chart, the coast along the Porcupines may be approached close-to as no other known outlying hazards exist. From the westerly end of the Porcupine Mountains to Black River Harbor, the shoal border extends approximately ½ mile offshore. None of the numerous rivers entering the lake in this reach are navigable with the exception of the Big Iron River, at Silver City which in September 1978 had a reported controlling depth at its mouth of 2 feet. Navigation of this river should not be attempted without local knowledge. Union Bay, a shallow bight west of Silver City, affords limited protection. A 500-foot-high stack with its upper third black, 4½ miles south of Silver City at White Pine, and a television mast, on top of a mountain about 6 miles west of Silver City, are prominent landmarks.

Time.—Lakeshore areas of the United States west of 89°50. 7′ W., which is about midway between Silver City and Black River Harbor on Lake Superior, observe central standard time or central daylight saving time. Areas east of this meridian, including the lakeshore areas of the Canadian Province of Ontario, observe eastern standard time or eastern daylight saving time.

Caution Area.—Special Use Airspace, as noted in Federal Regulations 14 C.F.R. Part 73, (Federal Aviation Adm., Dept of Transp.), Special Use Airspace, consists of the area above the surface of the earth as outlined by geographic coordinates and is to be used and controlled for specific purposes in the operation of aircraft. Area R-4305, Lake Superior, Minn., beginning at 47°45′00″ N., 90°05′00″ W.; to 47°45′00″ N., 89°28′00″ W.; to 46°55′00″ N., 89°28′00″ W.; 46°55′00″ N., 90°05′00″ W., to the point of beginning may be used for military purposes from the surface to a flight level of 45,000 feet. The using agency is the Commander, Second Air Force, Barksdale AFB, Louisiana, and the time of designation is 0001 local time Monday to 2400 local time Friday. The Controlling Agency is the Federal Aviation Administration, Minneapolis ARTC Center.

Mariners are cautioned to consult every U.S. Coast Guard Ninth District Notice to Mariners for additional information, firing schedules and changes.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake tunnel at Silver City extends about 1,900 feet 326° from the easterly bank of the Big Iron River, and has a depth of 20 feet over a submerged crib at its outer end.

Black River Harbor, Mich.—This harbor at the mouth of the Black River, 39 miles west of Ontonagon, offers shelter for commercial fishing and recreational craft. A park and recreation area maintained by the U.S. Forest Service are adjacent to the harbor.

Channels.—A dredge entrance channel leads from deep water in Lake Superior between converging breakwaters to a harbor basin inside the mouth of the river. In August 1978, the controlling depths were 10 feet in the entrance channel, thence 7 feet in the river channel and basin.

Aids to Navigation.—Black River East Breakwater Light is 30 feet above water on a white skeleton tower on the outer end of the east breakwater. Black River West Breakwater Light is 30 feet above water on a white skeleton tower on the outer end of the west breakwater.

Harbor Facilities.—The surrounding area is sparsely populated with a few dock spaces along the westerly shore of the river. Dockside facilities include gasoline, diesel fuel, water, electricity, sewage pump-out, and a launching ramp.

From Black River Harbor to Saxon Harbor, a distance of about 20 miles, the coast is relatively bold and may be approached close-to as no known hazards exist outside the shoal border which extends less than ½ mile offshore. The shore line is regular in a southwest direction with the exception of Little Girls Point, a projection about 6 miles northeast of Saxon Harbor.

Charts 14965, 14966, 14973.—Montreal River, about 1 mile northeast of Saxon Harbor is not navigable and is the boundary between the states of Michigan and Wisconsin.

Saxon Harbor, Wisconsin.—This small-boat basin was originally provided by Iron County, Wisconsin, just inside the original mouth of the Oronto Creek about 15 miles east of Chequamegon Bay.

Channels.—A dredged entrance channel leads from Lake Superior between converging breakwaters to an inner harbor basin and channel. In August 1978, the controlling depth was 9 feet in the entrance channel with 7 feet in the inner basin and channel.

Aids to Navigation.—Saxon East Breakwater Light is 24 feet above the water on a white column on the outer end of the east breakwater. Saxon West Breakwater Light is 24 feet above the water on a white steel column on the outer end of the west breakwater.

Harbor facilities.—A mooring dock, about 300 feet in length, is provided on the easterly side of the outer channel. A small boat ramp is located about midway along this dock. Iron County maintains a picnic area with

potable water near the harbor. Dockside facilities include gasoline and sewage pumpout.

Charts 14966, 14973.—From Saxon Harbor the shore line trend is northwest for approximately 22 miles to the westerly end of Long Island and the entrance to Chequamegon Bay. Marble (Clinton) Point, about 4 miles northwest of Saxon Harbor marks the western extremity of the high bluff country to the east. From this point the shore is characterized by low ground and marsh to Chequamegon Point Light, 39 feet above the lake on a white square pyramidal skeleton tower, located at the northwest tip of Long Island and marking the east side of the entrance to Chequamegon Bay. A diaphragm horn fog signal is maintained at this light.

Section V.—South Shore From Chequamegon Point to Superior, Wis., Including the Apostle Islands.

Charts 14966, 14973.—Long Island is an extension of **Chequamegon Point** to which it is connected by a reappearing sand bar. The island and point are sandy and wooded and have a maximum width of less than ¼ mile and a total length of about 7 miles. They lie in a northwest-southeast direction forming the northeast side of Chequamegon Bay. The shoal border in this reach extends approximately ½ to ¾ mile offshore.

The Apostle Islands are located to the north of this coast. Madeline Island, the southerly in this group, is 1½ miles north of Long Island. **South Channel** is a deep water passage between Madeline and Long Islands and is the easterly approach to Chequamegon Bay. The south side of South Channel is marked by La Pointe Light and the north side by two buoys off Madeline Island. La Pointe Light, shown on a white cylindrical tower 70 feet above the lake, is about 1¼ miles to the eastward of the west end of Long Island. A fog diaphragm horn and a radiobeacon are maintained at this station.

Submerged Cable.—A submerged control cable was installed by the Coast Guard in 1964. The cable extends from La Pointe Light 8,350 feet 004° to the southwest shore of Madeline Island.

Wreck.—Off Long Island, Wis., a wreck with a least depth of 9 feet over it and with 17 to 19 feet of water close outside, lies about 1 mile 113½° from La Pointe Light.

Charts 14966, 14973, 14974.—Chequamegon Bay, Wisconsin, is about 12 miles long by 5 miles in width at a point midway of its length which extends from northeast to southwest, and is separated from Lake Superior by Chequamegon Point and Long Island. The entrance to the bay is between Long Island and the mainland to the west. The easterly portion of the bay is covered by an extensive flat with the shoalest water around Oak Point in the easterly corner of the bay. The natural navigable channel follows the northwesterly shore from the westerly end of Long Island past the bluffs of Houghton Point, about 3 miles southwest, and Washburn Harbor 3 miles farther, thence south to Ashland Harbor near the head of the bay.

The shoal border off the west shore is marked by a buoy in 70 feet of water, about ¼ mile off Houghton Point. The westerly limit of the extensive shoal border to the east is marked by a buoy in 30 feet of water, about 2 miles south of Houghton Point.

Ashland Harbor, Wisconsin.—This harbor is near the head of Chequamegon Bay, which is sheltered from the storms on Lake Superior by Chequamegon Point and Long Island and by the Apostle Islands. The size of the bay, however, permits the generation within itself of waves, which in northeast storms are augmented by the swell coming in from the lake, and which, before the construction of the protecting breakwater, made it unsafe for vessels to lie at the end or on the exposed side of the wharves. The city of Ashland is situated on a low bluff which extends along the shore of the harbor. Stacks and spires in the city form prominent landmarks.

Channels.—A 1½-mile-long breakwater, on a northwest-southeast line about 2 miles northeast of the center of the Ashland waterfront, provides protection for the waterfront and the dredged areas along it. A dredged basin is off the piers in the eastern part of the harbor, and a dredged channel leads from deep water in the bay along the piers in the western part of the harbor.

In 1972, the controlling depths were 26 feet in the western part of the basin and 24 feet in the eastern part. In 1975, the approach to the western channel had a controlling depth of 19 feet with 19 feet in the eastern part of the channel, and thence in 1972, 20 feet in the western part of the channel.

An old dumping ground lies northeast of the northeast line of the dredged basin, with depth of 3 feet over it at about 1,200 feet from the basin, and must be avoided by keeping to westward of the buoys marking that side of the basin when entering or leaving the harbor.

Aids to Navigation.—Ashland Breakwater Light, 60 feet above the water, is shown from a white, octagonal, pyramidal tower on the outer end of the breakwater. Ashland Breakwater South Light, 25 feet above the lake, is displayed on a white pole on the inner or southeast end of the breakwater. The cannel and basin are well marked by buoys including two buoys marking the northerly edge of the West Channel.

Harbor Facilities.—Terminal facilities in 1978 consisted of a coal dock and several inactive docks. All vessels must use extreme caution when maneuvering along the waterfront due to the numerous and partially submerged ruins and piles.

There are limited berthing facilities for small craft in the harbor at the City Dock near the foot of Prentice Avenue and at the boat club dock near the foot of the 29th Ave. E. Fuel must be obtained by tank truck. A hospital and transportation facilities are available.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Ashland, Wis., is contained in the Port Series No. 49 (Revised 1974) published and sold by Corps of Engineers,

U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

National Weather Service Warning Display Station.—Signals are displayed from a steel tower on the bay front at the foot of Second Avenue West, near the intersection with Front Street, West. It is on top of the bluff about ½ mile southwest of the ore dock.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The City of Ashland water supply intake pipe extends about 1,900 feet, 329° from shore at the foot of 13th Avenue East, extended, and terminates in a submerged crib with least depth of 19 feet. The crib is in a deep hole which is surrounded except to the north by depths of 15 feet.

Washburn Harbor, Wisconsin, is on the west side of Chequamegon Bay, 4½ miles north of Ashland. This harbor, on the north side of an angle in the shore known as **Vandeventer Bay,** was formerly a shipping point for lumber. Ruins of the lumber wharves in the southwest part of the harbor are partially submerged and form a hazard to navigation.

Harbor Facilities.—A coal dock, unused in 1978, has an available depth of 20 feet along most of the dock face and in the approach. The city dock extends about 600 feet lakeward from the northeast corner of the coal dock, with a depth of 17 (in 1972) feet along its outer end, 19 feet along the southwest face and 17 feet along the northeast face. A small boat launching ramp and a small dock are maintained by the city near the foot of Sixth Avenue West.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The intake pipeline for the city of Washburn commences on the shore 2,150 feet 007° from the most easterly corner of the city dock in Washburn, and extends 400 feet 116° to an intake crib in about 12 feet of water. The structure is not marked.

Charts 14966, 14973.—From Houghton Point northerly to Bayfield Harbor the shoal border extends about ¼ mile offshore and with the exception of low ground in the vicinity of streams the shore line is generally bluff with the highest part being the bluff at **Van Tassells Point** which is about ⅔ of the way. This reach, protected on the east for most of its length by Long and Madeline Islands, affords a deep water passage from Chequamegon Bay past Bayfield. Submarine cables extend from Bayfield to **Pt. De Froid** at the northwest tip of Madeline Island.

Port Superior Village, Wis. is a community on the northwest shore of **Pikes Bay,** about 6¼ miles north of Houghton Point. In 1978, small-craft facilities were protected by a detached breakwater and included transient berths, gasoline, water, electricity, sewage pump-out, launch ramp, hoist, marine supplies, and some hull and engine repairs.

Bayfield Harbor, Wisconsin.—This well-protected harbor, about 15 miles northerly of Ashland, is used principally as a base for commercial fishing tugs and recreational craft and as a harbor of refuge for small craft. Ferries operate between this harbor and **La Pointe** on Madeline Island.

The harbor comprises three basins formed by breakwaters extending north and south from the city dock and from the shore north and south of the city dock. In 1976, the controlling depth in the south basin was 10 feet. The north basin and the small eastern basin on the south side of the city dock have depths of 8 to 10 feet.

Aids to Navigation.—The entrance to the south basin is marked on the north by North Breakwater Light and on the south by South Breakwater Light. The lights, 25 feet above the lake, are shown on white columns at the outer ends of the respective breakwaters. A fog diaphragm horn is located at the South Breakwater Light. Bayfield Municipal Breakwater Light marks the south side of the entrance to the north basin. The southwesterly outer end of the Yacht Club dock is marked with a privately maintained light.

Submerged Dock.—A submerged dock exists southwest of the Bayfield Harbor facility. The ruins commence on the shoreline 2,550 feet 188½° from the spire in Bayfield and extend 550 feet 083° to a crib in about 26 feet of water. There is a clearance of two feet over the dock and crib ruins. A buoy marks the outer end of the submerged crib at the easterly end of the ruins.

Harbor Facilities.—The city dock has a depth of 16 feet at its outer end with gradually diminishing depths towards shore, while Bodin's wharf to the north has 9 to 11 feet. Dock space is available in the south basin and at other wharves which are privately owned and mostly in poor condition. A marina in the south basin provides limited transient berthing, gasoline, diesel fuel, water, electricity, limited marine supplies, sewage pump-out, a launch ramp, a 25-ton mobile hoist capable of hauling out craft up to 65 feet in length and 17-foot beam, and marine repairs.

Coast Guard Station.—Bayfield Coast Guard Station is on the south side of the city, about 1,000 feet southwest of Bayfield Harbor South Breakwater Light.

From Bayfield the coast runs in a general northeasterly direction for about 6 miles to **Red Cliff Point,** thence northwest for about 8 miles to **Point Detour,** thence west and southwest for about 14 miles to Cornucopia Harbor. The shore is generally bluff and irregular with other prominent points and bays notably **Raspberry Point** lying about midway between the two aforementioned points, **Sand Point** about 5 miles west southwest of Point Detour, and **Squaw Point** about 2 miles northeasterly of Cornucopia Harbor. **Red Cliff Bay** is just south of **Red Cliff Point** and **Raspberry Bay** west of Raspberry Point. **Roys Point,** a small projection about 3 miles north of Bayfield, forms the south side of **Buffalo Bay.** Red Cliff is a small settlement on the hill overlooking that bay. A breakwater protects the small-craft facilities at Red Cliff.

The shore along this reach is generally deep-to and can safely be approached within about ¼ mile with the exception of a shoal which connects Point Detour with **York Island** and a shoal extending from the mouth of the **Sand River** about 2 miles east of Sand Point to the southeast corner of **Sand Island.** Additional information

of these shoals is provided in the description of the Apostle Islands, Wis. The West Channel, which provides access to Bayfield and Chequamegon Bay is a deep passage between the mainland, southeast of Point Detour, and the Apostles. Red Cliff Point buoy in 42 feet of water marks a turn in this channel abreast of Red Cliff Point.

Wrecks.—Northeast of the town of Red Cliff, a wreck lies in about 12 feet of water on the north side of the mouth of Chicago Creek. The large wooden wreckage tug Ottawa was burned November 29, 1909, and the hull lies submerged about 100 feet from the north shore of Red Cliff Bay under Red Cliff Point.

Apostle Islands, Wis.—There are good passages generally around and between the wooded islands of this group. A number of lighthouses are located on the outlying islands.

Madeline Island, the most southerly and largest of the Apostle Island group, is 12 miles long from southwest to northeast, and from 1 to 3¼ miles in width. From the southwest end, a sandy flat with generally less than 6 feet of water over it extends ¾ mile in a west-southwest direction, its outer edge being marked by a buoy. The south shore from this place to Big Bay, and including the area around the point on the south side of the bay, has shoal water extending out from ⅛ to ½ mile. In this reach a buoy marks the northerly side of the south channel vessel passage. The sand beach on the west side of Big Bay may be approached with safety to within 600 feet. The shore may be approached to within ¼ mile from Big Bay to the most easterly point of the island where shoal water makes out to the south, east, and north for ⅞ mile. From the east point along the northerly and westerly shores down to Point De Froid, the coast is generally bold and may be approached to within ¼ mile. Off Point De Froid a sandy spit with least depth of 15 feet at the outer end extends 1,900 feet in a northwesterly direction. From Point De Froid to the southwest end of the island, shoal water extends ¼ mile offshore.

La Pointe Harbor, Wis.—The community of La Pointe, adjacent to the harbor, is a small old settlement and summer resort near Point De Froid at the westerly end of Madeline Island. The area is connected by ferry with Bayfield, Wis., on the mainland. The Lake Superior water area south of the community has been partially enclosed with a breakwater to provide a protected small craft harbor area.

Channels.—The dredged basin on the east side of the breakwater is approached from the south. In August 1978, the controlling depths were 10 feet in the entrance channel and 8 feet in the basin.

A 400-foot L-shaped dock, constructed by local interests, extends from inside the shoreline to a short L-leg which ties into the breakwater.

Aids to Navigation.—The southerly end of the cellular breakwater is marked with Madeline Island Breakwater Light mounted 20 feet above the water on a white pole.

Harbor Facilities.—In addition to mooring facilities in the harbor described above, there are docks, a marine hoist, a pumpout station, and a ramp at a private marina located about ½ mile to the south.

Basswood and Hermit Islands are small, lying about 2 miles northwesterly from Madeline Island and easterly from the mainland in the vicinity of Red Cliff. The shores of both islands are bold and may be approached within 900 feet or less.

Stockton Island or Presque Isle, about 2½ miles north of the northeasterly end of Madeline Island, is 7½ miles long northeasterly and southwesterly, and about 2½ miles in general width, with Presque Isle Point projecting about 1½ miles from the southerly shore. The shoal area extends out 1,800 feet along the westerly side of Presque Isle Point; thence to the westward along the south shore, it decreases to 300 feet near the westerly end of the island. Around the west end, the shore may be approached to within 600 feet, and along the northerly and easterly sides to within 2,000 feet. On the westerly side of Presque Isle Point, and about ½ mile northward of the end, the Wisconsin Conservation Department built a dock of steel construction, 10 feet wide, with a concrete deck, about 300 feet in length. Mooring is limited to the north side of the dock.

Michigan and Gull Islands.—Michigan Island is on the easterly side of the group, about 3 miles northeast of Madeline Island. Michigan Island Light, 170 feet above the lake, shown from a white cylindrical tower is at the southwesterly end of the island.

Vessels passing to the south of Michigan Island should give the light a berth of at least 1 mile, to avoid the shallow water which extends ¾ mile southerly from the shore in that vicinity, with depth of but 12 feet at ½ mile out and only 16 feet at ⅝ mile out. The shoal border along the remainder of the southerly shore and that along the entire northerly shore is from ¼ to ½ mile wide. From the northeast point of the island a rocky ledge reaches 1⅜ miles to the northeast; on this ledge and about ½ mile from the point mentioned is Gull Island, very small and connected with Michigan Island by continuous stony patches having very scant depths. Gull Island Light, on the easterly middle part of the island, is 55 feet above lake level on a black square skeleton tower.

Gull Island Shoal is a detached rocky spot with least depth of 18 feet, lying northeast 3⅝ miles from Gull Island, and nearly due south of the extreme east side of Outer Island. This shoal is not marked and should be carefully avoided.

Outer Island, the most northeasterly one of the group, extends about 6 miles north and south and averages about 2½ miles in width, but has a sharp point at its southwesterly termination. Along the southeasterly face of the island a shelving rocky bank extends off an average distance of ½ mile, narrowing to ⅛ mile along the easterly shore. From the northeast point shoal water extends ½ mile in a northeast direction. Shoal water extends ⅝ mile off the northwesterly shore, diminishing in extent to about ⅓ mile proceeding southward along the west face of the island. Outer Island Light, at the north end of the island is 130 feet above the lake and shown from a white conical tower with dwelling attached.

Outer Island Shoal is an unmarked menace to be avoided

by vessels passing close along the north side of the Apostle Island group. The shoal is practically an extension of the offshore bank, with its outer edge 1½ miles northerly from the shore at Outer Island Light, and has depths of 16 to 18 feet over rock.

Wreck.—The wreck of a wooden schooner lies 1½ miles 057° from Outer Island Light.

Cat Island is 4 miles west of Outer Island and 2½ miles north of Stockton Island. The shelving bank extends out from ⅜ to ½ mile around the whole north end of the island and farther south it decreases to ⅛ mile or less on both the east and west sides, increasing again around the south end, from which a shoal extends southward ½ mile.

North Twin Island lies on the northerly edge of the group about 6 miles west of Outer Island. Off the southerly end, shoal water extends ½ mile in a southwesterly direction. The easterly shore may be approached within ¼ mile, and the northerly and westerly shores within ¼ to ⅜ mile.

Rocky and South Twin Islands are about 2½ miles to the southwest of North Twin. At their northerly ends a rocky flat with maximum available depth of 10 feet connects the two islands, and shoal water extends ⅓ mile off the southerly points of both. The west shore of Rocky Island may be approached within 1,000 feet, and the northerly shore within ⅓ mile, except at the northeast point, where a bank reaches 1⅛ miles in a northeasterly direction from the extremity of the narrow peninsula extending 1⅛ miles from the main body of the island. Off the east shore of South Twin Island shoal water is found from ⅜ to ⅝ mile out. In the bay formed by these islands the shores may be approached within 900 feet as far north as the small point of land on South Twin Island; this bay affords anchorage in mud, and is sheltered from west and northwest winds. Within the small bay on the east side of Rocky Island, there is an unmarked submerged crib in about 7 feet of water. Commercial fishermen have docks on both islands around the bay.

Ironwood and Otter Islands are near the center of the island group. Vessels should not approach the easterly or northeasterly shores of either island, or the southerly shores of Ironwood Island, nearer than ⅓ mile; the other shores of both islands should be given a berth of 1,000 feet. Oak Island Shoal is 1 mile to the southwestward of Otter Island.

Manitou Island, to the southwestward of Ironwood Island is 1¾ miles northwest of Stockton Island and the same distance northeast of Oak Island. The shores may be approached within 1,200 feet, except off the extreme westerly point where a shoal about 2,300 feet in width extends ⅝ mile in a northwest direction. Near the outer end of this shoal is a small rocky islet, called **Little Manitou Island,** with very shallow water for some distance inside it. Little Manitou Island Light, 21 feet above lake level is shown on a pole with small house located on Little Manitou Island.

Oak Island, about 3½ miles long north and south by 2½ miles wide, lying about 1½ miles northeasterly off the mainland above Red Cliff Point, is very bold, reaching over 400 feet above the lake. Its shores may be approached to within 1,100 feet along the east and north faces and to within 1,700 feet along the west and south sides.

Oak Island Shoal, with minimum depth of 18 feet, lies ⅞ mile northeasterly from the most northerly point of Oak Island, the deep-water channel between the two being ⅝ mile wide, and that between the shoal and Otter Island being over ⅞ mile wide.

Raspberry Island is about 2 miles northwest of Oak Island and 1¾ miles northeast of the mainland at Point Detour. Shoal water extends from ⅛ to ⅜ mile from shore, the maximum extent being on the south side and contiguous to the southerly vessel passage through the island group. Raspberry Island Light, on the southwest point of the island, 55 feet above the lake is mounted on a steel column. An abandoned lighthouse is about 100 feet north of the light. Marina Shoal buoy, located about 1,200 feet 256° from Raspberry Island Light, marks the westerly edge of the shoal water making out from the light.

Bear Island is 1¾ miles northeast of Raspberry Island. Shoal water makes out an average distance of ⅝ mile from the northwesterly face, ¼ mile around the southerly end and decreases to less than 1,000 feet on the east and west sides.

Bear Island Shoal, with 13 feet least depth, lies to the westward of the northerly end of Bear Island, 2 miles distant from the nearest point of the island, and bearing northwesterly 4⅛ miles from Raspberry Island Light, and southwesterly 5⅜ miles from Devils Island Light. It extends ½ mile in a north and south direction, and is over ¼ mile in width. York Island Shoals lie about ⅞ mile to the southwestward of this shoal.

Devils Island is the northernmost island in the westerly part of the group. Vessels may approach within 800 feet on the east and west sides and around the northerly end; the south end should be given a berth of ¼ mile. On the north end is Devils Island Light, 100 feet above the lake on a white cylindrical tower. A fog signal, radiobeacon, and radar transponder beacon (RACON) are at the light. (See Light List for details.)

Devils Island Shoal, a detached rocky shoal with least depth of 11 feet, lies 1½ miles easterly from the light, and due north of the extreme west side of Rocky Island. There is over 1 mile width of deep water between the shoal and Devils Island.

York Island lies about 1 mile north of Point Detour on the main shore. Shoal water extends ⅝ mile off the south point, leaving a passage from 20 to 25 feet deep and 1,800 feet wide between the island and the main shore and passing within 600 feet of the latter. Shoal water extends ½ mile from the southwesterly shore and ⅜ mile from the north and east shores.

York Island Shoals are detached rocky patches with least depth of 14 feet, lying northeasterly about 4⅝ miles from Sand Island Light and northwesterly about 3¼ miles from Raspberry Island Light; the main reef extends north and south 1 mile, and is about ⅜ mile wide at its northerly end. A buoy is maintained in about 30 feet of water off the northwesterly edge of the shoals,

at the westerly entrance to the Apostle Islands. There are several detached spots with from 19 to 22 feet lying to the east and southeast off the southerly end of the main shoal. The width of the available deep channel on the vessel course passing between the most southerly spot and the adjacent shore of York Island is about 1½ miles. Bear Island Shoal lies about ⅞ mile to northeastward of these shoals.

Sand Island is 1¼ miles north of the mainland at Sand Point. Shoal water extends from the southeasterly end of the island in a southerly direction to the mouth of Sand River on the mainland shore; the least depths across this ridge are from 3 to 7 feet. Along the middle of the easterly shore shoal water extends off ⅝ mile, decreasing in extent to the north and south. The northwesterly shore must not be approached within ⅝ mile, nor the westerly shore within ¼ mile. Sand Island Light, 60 feet above the lake with a white daymark on a square skeleton tower, is situated on the northernmost point.

Sand Island Shoals are detached and rocky, with least depth of 14 feet, running about 1½ miles in a northeast and southwest direction, and being nearly ½ mile wide at the northerly end. The south end of the shoals lies about ½ mile easterly from the extreme easterly point of Sand Island with a maximum depth of about 25 feet intervening, and the north end, marked by a buoy about 1½ miles 63° from Sand Island Light.

Wreck.—The Steamer *Sevona* is on Sand Island shoals.

Chart 14966.—Eagle and Steamboat Islands.—Eagle Island, about 3¼ miles southwest of Sand Island and the most westerly of the Apostle group, is small, with shoal water extending off-shore 1,000 feet around the west, north, and east shores. From the southerly point, a shoal decreasing from ½ to ⅛ mile in width, extends in a southerly direction ⅔ mile. On the shoal, about 1,000 feet southeasterly from the south point of Eagle Island, was formerly a small island called Steamboat Island, which has worn away, leaving a narrow shoal of gravel and boulders, with nothing in sight except at low water and in rough weather. The width of deep water between the southerly extremity of the shoal and the bold mainland shore opposite is 1¼ miles.

Eagle Island Shoal, composed of rocks, sand, and clay, lies with its northerly end about 1 mile southwesterly of the south end of Eagle Island. Within the 21-foot contour the shoal is about 1 mile long northeasterly and southwesterly and ½ mile wide, and is about 6,000 feet distant from the adjacent mainland. The least depth on the shoal is 11 feet, located 1.6 miles southwesterly from the south end of Eagle Island.

The deep water passage from the north to the West Channel leads between Sand Island Shoals and York Island Shoals and thence between York Island and Raspberry Island. As indicated above, these shoals and a shoal off Raspberry Island are marked by buoys and Raspberry Island's west shore by a light.

Cornucopia Harbor, Wisconsin, is located at the mouth of the **Siskiwit River** near the southeast corner of Siskiwit Bay and approximately 46 miles east of Duluth, and offers good protection from most winds. The principal use of this harbor is as a base for commercial fishing tugs and as a refuge for pleasure craft.

Channels.—A dredged entrance channel leads southeast from deep water in Lake Superior between two piers to an inner basin which connects two inner channels leading east and southwest. In May 1978, the controlling depths were 10 feet in the approach channel, thence 11 feet between the piers, thence 8 feet in the east channel and 7 feet in the southwest channel.

Aids to Navigation.—Cornucopia East Pier Light, 20 feet above the lake on a white skeleton tower, is on the outer end of the east pier.

Harbor Facilities.—A municipal dock is located on the westerly arm of the inner basin. Fuel is available at a dockside pump. Other accommodations are available nearby in the village.

The Siskiwit River is not navigable above the dredged portion of the harbor basin.

From Cornucopia Harbor to Port Wing the coast is relatively bold and may be approached within ½ mile except off **Bark Point.** This point with its outer end about 4 miles west of Squaw Point and about 4 miles northwest of Cornucopia Harbor is about 2 miles long and ½ mile wide. It projects in a northeasterly direction and off its outer end a shoal makes out for about 1 mile to the northeast with a depth of 19 feet at about ½ mile from shore. The deep indentation in the shore between Squaw and Bark Points is divided near its center by a point projecting northerly about 1 mile. Siskiwit Bay is east of this point and **Bark Bay** to the west of this point and immediately east of Bark Point. The latter bay is protected from most winds except those from the northeast and offers good depths close-to and has fair holding ground.

Herbster, a small settlement is near the mouth of **Cranberry River,** 5½ miles southwest of Bark Point and 41 miles east of Duluth. A wharf which formerly extended 200 feet into the lake to a depth of 5 feet was in ruins in July 1966.

Port Wing Harbor, Wis.—Port Wing, located at the mouth of the **Flag River,** is about 34 miles east of Duluth. Commercial fishing tugs and pleasure craft operate out of this harbor and this comprises its principal use.

Channels.—A dredged entrance channel leads from deep water in Lake Superior between parallel piers to an inner basin which connects with two inner channels leading east inside the shoreline and south into the Flag River. In May 1978, the controlling depths were 10 feet in the approach channel, thence 14 feet between the piers, thence 8 feet in the east inner channel, and thence in 1972, 3 feet in the south inner channel. The south channel is subject to severe shoaling from drifting sand.

Harbor Facilities.—This is an isolated harbor about a mile from the village of Port Wing. Fuel must be obtained from local fishermen or by tank truck delivery. There is a small boat ramp and little dockage available for pleasure craft.

The coast from Port Wing to Superior Entry runs west-southwesterly for about 20 miles and westerly for 11 miles. It is relatively low and regular and may safely be ap-

proached to within about ¾ mile with the exception of an area about 7 miles westerly of Port Wing where the shoal border extends to about 1½ miles offshore and an isolated shoal with a least depth of 21 feet located about 1 mile 116° from Superior Entry South Breakwater Light. Several streams enter the lake in this reach, but none are navigable.

Section VI.—West and North Shores From Superior, Wis., to Pigeon River, Minn.

Charts 14966, 14975.—Duluth-Superior Harbor, Minn. and Wis. is located at the west end or head of Lake Superior. The harbor has been developed along Superior Bay and the lower section of the St. Louis River which forms a part of the boundary between Minnesota and Wisconsin. It is one of the most important harbors on the Great Lakes, both on account of facilities, natural and artificial, and the magnitude of its commerce. The cities of Duluth, Minnesota, and Superior, Wisconsin, front on this harbor.

Superior Bay which is about 6½ miles long and ½ to 1 mile wide is a natural shallow basin separated from Lake Superior by **Minnesota Point**, a low sand and gravel formation from ⅛ to ¼ mile wide, and extending 6¾ miles southeast from high ground at the extreme west end of the lake to Superior Entry which leads from Lake Superior into the southerly end of the bay. Near the northerly end of Minnesota Point, the Duluth Ship Canal also connects the lake and bay. The Lake Superior coast bordering Minnesota Point between Superior Entry and Duluth Ship Canal is clear of outlying hazards with the shoal border extending about ⅜ mile offshore. The coastline trend is northwest in this section and continues northwest for about ½ mile past Duluth Ship Canal to the inner end of the point, thence turns to the northeast forming a small bight immediately north of the canal. Navigation in this bight is hazardous due to a submerged breakwater extending about 1,000 feet southeasterly from shore at the foot of Fourth Ave. East, marked near its outer end by a buoy, and several stone filled timber cribs, usually above water, extending out to depths of about 12 feet, located about midway between Duluth Ship Canal and the inner end of the old breakwater.

Allouez Bay is an extension of Superior Bay to the southeast and is protected from the lake by **Wisconsin Point.**

The Nemadji River, Wis., enters Superior Bay opposite Superior Entry. Its source is in **Moosecamp Lake,** about 40 miles by river southwest of Superior. In its lower part it has an almost uniform width of about 140 feet, with an available depth of 3 feet for 2½ miles from its mouth and 2 feet above that point. In 1976, 4 feet was available over the bar in the mouth of the river. There has been no navigation on the river during recent years.

The St. Louis River enters the southwest side of Superior Bay about 2 miles from its northwest end through a narrows between **Rices Point** in Duluth, on the north and **Connors Point** in Superior, on the south. Upstream from these points, which are connected by an interstate highway bridge, the river widens to form **St. Louis Bay** which extends southwesterly about 3 miles to another narrows between **Grassy Point,** on the northwest or Minnesota shore, and the Wisconsin shore. This narrows is crossed by a railroad and a highway bridge. Howards Bay is a narrow inlet about a mile long leading off St. Louis Bay along the southwest side of Connors Point.

Above Grassy Point, the river again widens, covering a large shallow area, cut up by points and islands into several irregularly shaped bays and inlets, extending about 2 miles west and 2½ miles to 3 miles to the south. Clough (Big) Island the largest island in this area, is about a mile long north and south and about ¾ mile wide. It forms the north side of **Spirit Lake** which is a section of the river mostly isolated by islands. The improved deep water channel, in this section called the **Minnesota Channel,** turns west from Grassy Point for two miles along the Minnesota shore, curves to the south between the mainland and Clough (Big) Island and then swings east along the south side of the island to the upper end of government maintenance.

St. Louis River-Natural Channel.—Between Grassy Point and Spirit Lake, the meandering natural channel, which was superseded by the more direct Minnesota Channel has been blocked at various points by wharf construction and deposits of dredged material so that only disconnected segments of it remain.

About ½ mile westerly from Grassy Point, a curving natural cut-off channel, branching from the southerly side of Minnesota Channel, extends to **Pokegama Bay,** and, passing on the easterly side of Clough (Big) Island and the small island off its southeast tip, connects with the natural channel a short distance above the upper end of the Minnesota Channel and at a distance of about 2¼ miles from the starting point. The controlling depth in this channel is about 5 feet.

The St. Louis River above Clough (Big) Island is not considered a part of Duluth Harbor project. Off the southeast point of the island, the natural channel turns southerly and for about 2 miles is between the east side of a low island which forms the east side of Spirit Lake and a point which forms the west side of Pokegama Bay. Above the lake the river again narrows and has widths ranging from 400 to 2,500 feet. It is navigable for varying drafts past **Fond du Lac** which is about 8¼ miles above Clough (Big) Island. The river is practically a level pool at ordinary stages up to the foot of the rapids just above Fond du Lac, and, vessels of suitable draft should have no difficulty in navigating it.

The channel in this reach is well marked with buoys. The Duluth, Missabe and Iron Range Ry. Co. (Interstate Transfer) bridge which connects New Duluth, Minnesota, and Oliver, Wisconsin, is about 3½ miles above Clough (Big) Island. (See Bridge Regulations)

At **Fond du Lac,** a mud island and shoal extends off the mouth of Mission Creek. A very narrow channel along the south shore affords access for about 7 feet draft to the river above the creek. The distance from the Burlington Northern (NP) Railway bridge at Grassy Point to

Fond du Lac is about 13⅛ miles by the main channel and about 11¾ miles by the cut-off channels.

Channels.—One Federal project encompasses Superior-Duluth Harbor. Channels have been dredged in Superior Entry, Duluth Ship Canal, Superior Bay, Allouez Bay, Howards Bay, St. Louis Bay, and St. Louis River as far as the south side of Clough Island.

Superior Harbor is entered from deep water in Lake Superior between converging breakwaters to the south end of Superior Bay. Federal project depths are 31 to 27 feet in Superior Entry, thence 27 feet in Superior Harbor Basin and anchorage area, Allouez Bay Channel, and Superior Front Channel. (See Local Notice to Mariners and latest editions of charts for controlling depths.)

Duluth Harbor is entered from deep water in the lake between parallel piers to the north end of Superior Bay. Federal project depths are 32 to 28 feet in Duluth Ship Canal, 28 to 27 feet in Duluth Harbor Basin and anchorage area, and 27 feet in East Gate Basin. (See Local Notice to Mariners and latest editions of charts for controlling depths.)

In St. Louis Bay and River the Federal project depths are 27 feet in West Gate Basin and Howards Bay channel, 27 feet in North Channel eastern section and 21 feet in the western section, 20 feet in 21st Avenue West Channel, 27 feet in South Channel eastern section and Cross Channel, 23 feet in South Channel western section and Upper Channel, and 23 feet in Minnesota Channel eastern section with 20 feet in the western section. (See Local Notice to Mariners and latest editions of charts for controlling depths.)

Vessels drawing more than 16 feet are cautioned against navigating within 50 feet of piers at Superior Entry due to stone riprap.

In Duluth Ship Canal vessels drawing more than 20 feet should not navigate within 20 feet of the piers due to stone riprap.

Wreck.—The wreck of the burned steamer M. C. Neff, a wooden vessel 137 feet long and 28 feet wide, lies in the St. Louis River about 500 feet south of the Interstate Transfer Railway bridge, New Duluth, 50 feet from the east shore of the river, headed upstream. The wreck is to some extent an obstruction to navigation and caution should be used in navigating the river in this locality. In June 1966, a least depth of 2½ feet was found over this wreck.

Currents at Superior Entry.—There are frequent currents setting through Superior Entry, usually simultaneous with and of the same direction as those at Duluth Canal. (See description following.) They are, however, of less velocity than the latter, owing to the greater length of channel and the consequent smaller degree of slope for any difference of level between lake and harbor. (See Aids to Navigation.)

Currents at Duluth Ship Canal.—Currents of various degrees of strength are prevalent at the canal, due principally to oscillations of the lake surface, setting in or out accordingly as the lake temporarily rises or falls, and usually of moderate velocity and short duration. On rare occasions a large seiche will produce a current which reaches for a few minutes a velocity in the neighborhood of 6 miles per hour, followed by a reverse current perhaps equally strong. The stronger currents cause some inconvenience to navigation, but nothing serious unless accompanied by storms.

When an outward current meets a heavy sea from the northeast, it increases the height of the waves, forms a choppy and turbulent sea, making entrance by vessels somewhat difficult and dangerous. Instances have been reported of vessels being thrown against the piers under these conditions. In ordinary storms, however, the danger from this cause seems to be slight, and failure to make the entrance has been rare. (See Aids to Navigation.)

Since the main portion of Duluth is built on the side of a steep bluff which reaches over 500 feet above the lake, the city is visible for a long distance out in Lake Superior. Enger Memorial, a stone tower on a height overlooking the city, and radio and television masts, on high ground to the north of the tower, are very prominent landmarks. Also prominent, on low ground are the grain elevators on Rices Point and the Duluth Ship Canal Bridge.

Superior is built on lower ground and is relatively less prominent from the lake. However, the ore docks, opposite Superior Entry, and the grain elevators, about 1 mile north and near Howards Bay, are prominent.

Duluth Ship Canal Bridge.—The vertical-lift bridge over the canal is operated by the city of Duluth in conformity with provisions of the harbor rules and regulations as published in 33 C.F.R. § 117.640a of Rules and Regulations, preceding. The fixed span crosses the canal at a height of 180 feet, and the lift truss beneath it spans the full width of canal and affords, when raised, available headroom of 138 feet above Low Water Datum, 137 feet above ordinary high water, and about 135 feet above the highest recorded stage in the harbor. The structure as a whole is a prominent landmark, reaching an elevation of 227 feet above the water.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A 24 inch potable water intake pipeline of the city of Superior commences on the shoreline 1,525 feet 293° from the chimney on the Peavey Co. Flour Mills dock and extends 2,150 feet 059° to a turn, thence 1,400 feet 055° to a turn, thence 500 feet 029° into the shoreline of Minnesota Point. The pipeline continues into a well area on Minnesota Point.

Pipeline.—An abandoned pipeline commences on the shoreline 1,550 feet 293° from the chimney on the Peavey Co. Flour Mills dock and extends 3,950 feet 054° to the shoreline of Minnesota Point. The section through the channel has been removed.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A 36 inch water intake pipeline of the city of Cloquet, Minnesota, commences on the

shoreline 1,575 feet 293° from the chimney on the Peavey Co. Flour Mills dock and extends 4,800 feet 056° (37 feet depth under channel) to the lake shore line on Minnesota Point, Minn., thence a 48 inch pipeline extends about 10,640 feet 024° to an intake structure in 71 feet of water. The depth over the intake structure is 53 feet and it is not marked.

Wreck.—The wreck of the steel whaleback **Thomas Wilson**, a 308-foot vessel which sank June 7, 1902 after a collision with the wooden George G. Hadley (removed), lies in 60 feet of water at about 46°47'00" N., 92°04'11" W. In June 1973, divers confirmed the Wilson was still at this location.

Aids to Navigation.—In addition to the aids described below there are numerous ranges, lights and buoys to mark the maintained and natural channels in this harbor.

Superior Entry North Breakwater Light, 70 feet above the lake, on a white skeleton tower, is on the outer end of the north breakwater. South Breakwater Light, 70 feet above the lake, on a white cylindrical tower is on the outer end of the south breakwater; a marker radiobeacon and fog diaphragm horn are maintained at this station.

Inner North Pierhead Light, 39 feet above the lake on a white skeleton tower is on the outer end of the north inner pier. Inner South Pierhead Light, 39 feet above the lake is mounted on a white skeleton tower on the outer end of the south inner pier.

Superior Harbor Basin Light No. 1, 36 feet above the lake mounted on a white skeleton tower is on the inner end of the south pier.

Superior Entry Current Indicator Lights.—Signal lights indicating the velocity and direction of the current in Superior Entry are located on the South Pierhead Light Tower, 35 feet above the lake on the lakeward end of the pier. For vessels leaving the harbor, the indicator light is mounted on the structure of Harbor Basin Light No. 1, 27 feet above the lake. The velocity and direction of the existing current is indicated by the lights as follows:

Characteristics of lights	Current	
	Direction	Velocity
Fixed White	In or out	Less than 1 mph.
Fixed Red	Outbound	Between 1 and 3 mph.
Flashing Red	Outbound	Greater than 3 mph.
Fixed Green	Inbound	Between 1 and 3 mph.
Flashing Green	Inbound	Greater than 3 mph.

Duluth South Breakwater Outer Light, 44 feet above the lake on a white tower, is located on the outer end of the south pier; a fog diaphragm horn and radiobeacon are operated at this station. The South Breakwater Inner Light, 68 feet above the lake, mounted on a black cylindrical tower, is located near the inner end of the south pier 1,200 feet 245° from the outer light. An auxiliary fixed green light on the outer light structure, visible between bearing 008° and 098°, serves in range with the inner light as a guide to make the turn from the harbor basin into the canal, outbound.

Duluth North Pier Light, 43 feet above the lake, on a white cylindrical tower, is located on the outer end of the north pier.

In addition to the above, the United States has provided 16 steel posts on each pier, each with a louvered fixture carrying an amber lamp. The purpose of the lamps is ornamentation, but they also form a conspicuous landmark and afford additional facility to vessels entering the canal. They are 25 feet above water and should be visible 11 miles. The lights are usually on from shortly after sunset to nearly sunrise during the navigation season.

Duluth Harbor Basin Traffic Buoy is a vertically striped black and white lighted buoy moored in Duluth Harbor Basin at a point about 2,425 feet 233½° from the South Breakwater Inner Light. All vessels, incoming or outgoing, should leave this traffic buoy on the starboard hand except vessels proceeding to or from docks on the northwesterly side of the harbor basin, in which cases the regular navigation rules will apply. To the east of the traffic buoy are a black can buoy and a black lighted buoy marking the extent of the dredged area at the north end of Minnesota Point.

Warning Signal Light for Outbound Vessels.—A flashing amber signal light located on the westerly side of the fixed span of Duluth Ship Canal bridge is operated by the city of Duluth for the purpose of warning outbound vessels within Duluth Harbor Basin of the approach from Lake Superior of inbound vessels exceeding 300 gross tons and barges or scows exceeding (light) 100 displacement tons. The light is not intended to regulate traffic, but to assist outbound vessels in complying with the regulation which prohibits the passing in Duluth Ship Canal by vessels of the sizes mentioned and noted in **33 CFR § 162.110** published in **Rules and Regulations**, preceding. Subject to mechanical failure or reasons beyond control, the bridge operators will cause the amber light to commence flashing when, in their opinion, a vessel or craft of the tonnage above stated will enter Duluth Ship Canal from Lake Superior within 15 minutes, the flashing to continue until the incoming vessel has cleared the canal. Masters are cautioned that the signal light does not relieve them of responsibility to observe the passing regulation or of any other responsibility inherent in their duties relating to maneuvering, signaling, or other functions.

Duluth Canal Current Indicator Lights.—Signal lights indicating the velocity and direction of currents are located on the North Pier Light structure, 38 feet above the water, and on a standard, 30 feet above the water at

Bridges, Duluth-Superior Harbor, St. Louis River, and Nemadji River

No.	Location and name	Kind	Draw or span openings—clear width in feet proceeding upstream		Clear height above low-water datum	Remarks
			Right	Left		
1	Duluth Ship Canal (Minn. Point)	Highway				See Note 1.
3	John A. Blatnik (formerly Duluth Superior High) (between Rices and Conners Points).	do			123	See Note 3.
4	Burlington Northern (NP) Ry., St. Louis Bay:					
	North Channel (Minn. draw)	Railway	175	175	16	See Note 4.
	South Channel (Wis. draw)	do	175	175	14.8	Do.
5	Burlington Northern (NP) Ry., Grassy Point	do	175	175	12	See Note 5.
6	Arrowhead, Grassy Point	Highway			33.7	See Note 6.
7	Duluth, Missabe and Iron Range Ry. (Transfer) bridge.	Railway and highway.	125	125	22.4	See Note 7.
8	St. Louis County, at Fond du Lac	Highway			23.9	See Note 8.
9	Burlington Northern (NP) Ry., Nemadji River.	Railway	59	59	13	See Note 9.
10	East Second Street, Superior, Nemadji River	Highway			9.6	See Note 10.
11	Chicago & NW. Ry., Nemadji River	Railway			26	See Note 11.

Signals for Opening Bridge Draws are given briefly in the notes following, and in detail in references under Bridge Regulations following.

NOTE 1.—Vertical lift: the clear width of opening is the full 300 feet width of canal; the clear height when lift truss is down is 16.5 feet for width of 192 feet at middle, reducing to 14.5 feet at ends of span; clear height when lift is up, 138 feet.

Signal for raising lift, 1 long, 1 short, 1 long, 1 short (— — — —). An electric light signal on lift span near center gives flash of same duration and at same time as the return air-diaphone signal. The light is an aid during heavy winds at night when return signal might not be heard.

The city of Duluth, Minn., operates a radio station to transmit and receive calls for the Aerial Lift Bridge, call sign KAN 388 on F. M. Marine Channels #16 (156.8 mHz), #10 (156.5 mHz), #12 (156.6 mHz), #13 (156.65 mHz), #68 (156.425 mHz). All Channels are monitored continuously.

NOTE 3.—Fixed span of the Duluth-Superior High Bridge over entrance to St. Louis Bay has a clear height of 123 feet for a width of 460 feet. The channel between the bridge piers is 500 feet wide.

The fixed span of the Duluth-Superior High Bridge over Howards Bay has a clear height of 103 feet and a clear width of channel of 130 feet.

NOTE 4.—Deep water through each draw opening. South draw span is double tracked, crosses channel diagonally, and is 479 feet long. North span is single tracked, 425 feet long. Fixed rafting span next to Minnesota shore has 150 feet clear channel width, and 16.4 feet clear height above low-water datum.

Lights are same as given under Note 2.

Signal for opening North draw, 1 long, 2 short (— — —); South draw, 2 long, 2 short (— — — —).

NOTE 5.—Deep water through each draw opening. There is a fixed span adjoining each end of the draw span, with 64 feet clear width of channel and 13 feet clear headroom. The available depth through the east fixed span is 8 feet or more, and through the west fixed span 5 feet or more.

There is a red light at each free end of the draw rest, and two square lanterns on the draw span, one at each end, show white when bridge is open and red when closed.

Signal for opening draw, 2 short, 1 long (— — —).

NOTE 6.—Bascule; deep water through opening; clear width of opening 211 feet and clear height 33.7 feet at center when closed.

Signal for opening lift, 3 long (— — —).

NOTE 7.—Deep water through each draw opening. Bridge has 300-foot steel swinging span, with two decks and is maintained in the closed position, subject to restoration of operation if subsequent development of navigation so requires. See bridge regulations below.

NOTE 8.—Concrete arch; clear height given is at center. About 4 feet of water in span next to Minnesota shore and 7 feet in span next to Wisconsin shore.

NOTE 9.—Only 7 feet of water through the bridge openings. Can only be opened by hand.

NOTE 10.—Fixed span with clear opening of 256 feet.

NOTE 11.—Fixed span with clear opening of 70 feet.

Similar signals are given in return from the drawbridges, except that, when not ready to open, 5 short blasts (— — — — —) are sounded to indicate that vessel is to stop until the regular signal is given.

the inner end of the pier. The direction and velocity are indicated by the lights as follows:

Characteristics of lights	Current	
	Direction	Velocity
Fixed White	In or out	Less than 1 mph.
Fixed Red	Outbound	Between 1 and 3 mph.
Flashing Red	Outbound	Greater than 3 mph.
Fixed Green	Inbound	Between 1 and 3 mph.
Flashing Green	Inbound	Greater than 3 mph.

Harbor Facilities.—This harbor is well equipped with general cargo and miscellaneous docks, grain elevators, and terminal facilities for handling iron ore, coal, limestone, petroleum, steel and scrap iron, 113 in all. Small craft basins are located on the northeast side of Duluth Harbor Basin adjacent to the Arena Auditorium, at the foot of 72nd Avenue, West, and at Riverside on the St. Louis River opposite Clough (Big) Island. These afford ample facilities for recreational craft of all sizes, including marine railways, hoists, fuel, docking and electricity.

Fraser Shipyards, Inc., have dry docks at the head of Howard Bay with the following dimensions:

Dry Docks—Duluth-Superior Harbor

Fraser Shipyards, Inc.

Dry Docks at Head of Howards Bay

No. 1	*Feet*
Length overall	831
Length on keel blocks	610
Entrance width, top	66
Entrance width, bottom	60.5
Dock width	77.5
Depth of sill below LWD	14.5

No. 2	*Feet*
Length over all	831
Length on keel blocks	800
Entrance width, top	85
Entrance width, bottom	80
Dock width	95
Depth of sill below LWD	18.5

No. 3	*Feet*
Length overall	131
Length on keel blocks	131
Entrance width, top and bottom	80
Depth of sill below LWD	6

Repairs of all kinds are made in these dry docks.

Medical facilities are available at three well equipped hospitals in Duluth and three in Superior.

Port Series.—The report containing detailed information on port and harbor facilities for the Ports of Duluth-Superior, Minn. and Wis., are contained in the Port Series No. 49 (Revised 1974) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Coast Guard Station.—Duluth Coast Guard Station is located on Minnesota Point, about ½ mile southerly of the Duluth Canal.

Captain of the Port Areas.—See 33 U.S.C. § 3.45–75 of Rules and Regulations, preceding.

Bridge Regulations.—See 33 U.S.C. 1, 33 U.S.C. 419, 33 U.S.C. 499, published in Certain Laws, preceding, and 33 CFR § 117.640a and § 117.641, published in Rules and Regulations, preceding.

Dumping Ground Regulations.—See 33 U.S.C. 419 published in Certain Laws, preceding, and 33 CFR § 205, published in Rules and Regulations, preceding.

Navigation Regulations.—See 33 CFR § 162.110 and § 207.400 of Rules and Regulations, preceding.

Pilot Dispatch Offices.—The Lakes Huron and Michigan. St. Marys River and Lake Superior, in Great Lakes Pilotage District No. 3 are serviced by the following dispatch offices:

Upper Great Lakes Pilots, Inc.
Detour, Michigan
906-297-5111
Upper Great Lakes Pilots, Inc.
802 Garfield Avenue
Duluth, Minnesota 55802
218-722-1425

Local Harbor Regulations.—Harbor regulations have been established and are enforced by the Seaway Port Authority of Duluth. Copies of the regulations may be obtained from the Seaway Port Authority of Duluth, 1200 Port Terminal Drive, Duluth, Minn. 55802.

The stretch of coast about 18½ miles long from Duluth Harbor, Minn., to Knife River Harbor, Minn., has a fairly uniform northeasterly trend and is rocky and bold. The bank is generally steep with heights of 600 feet within 2 miles of shore. **Stony Point** about 2 miles southwest of Knife River is a most prominent point. The coast can be safely approached to within ¼ mile as no known outlying hazards exist. There are no landings in this reach of the lake. The settlements of **Talmadge, French River and** Palmers are on U.S. Highway 61 which follows the coast between these harbors. A red and white checkered tank is located on high ground about 3 miles west of Stony Point and 1½ miles from shore. It is lighted by red lights and forms a very prominent landmark.

Potable Water Intakes.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 CFR § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline of the city of Duluth commences at a point on the shoreline 1,120 feet 072° from the mouth of Lester River and extends about 1,020 feet 157° to an intake structure. There is a least depth of 51 feet over the structure and it is not marked.

A potable water intake pipeline of the city of Duluth commences at a point on the shoreline 15,200 feet 052° from the mouth of the Lester River and extends about 1,750 feet 129° to an intake crib in about 60 feet of water. The structure is not marked.

Knife River Harbor, Minn.—This harbor is located on the northerly side of Granite Point and is about 2,000 feet

south of the mouth of the Knife River. Commercial fishing tugs and recreational small craft are the principal users of this harbor. The settlement and post office of Knife River, Minn., are west of the harbor.

Channels.—A breakwater extending from Granite Point protects the entrance to the harbor from the southeast. A dredged entrance channel leads from deep water in Lake Superior on the north side of the breakwater to an inner channel about 0.2 mile long. In 1976, the controlling depths were 9 feet in the entrance channel and 7 feet in the inner channel except for shoaling along the edges.

Aid to Navigation.—Knife River Harbor Entrance Light, 20 feet above the lake on a white column, is on the outer end of the south breakwater.

Harbor Facilities.—A county owned marina provides transient berthing, gasoline, diesel fuel, water, electricity, launch ramp, 20-ton hoist, marine supplies, sewage pumpout facility and hull and engine repairs.

Knife River, about 2,000 feet north of the harbor is not navigable. An offshore dock south of the river mouth is in ruins and hazardous and useless for dockage. **Knife Island,** about midway between the harbor entrance and the river mouth and about ½ mile offshore, has a shoal extending off its southwest corner in a southwest direction to within about 500 feet of Granite Point. The remainder of the island may be approached to within about 350 feet.

The shore in this reach of 7 miles from Knife River Harbor, Minn., to Two Harbors, Minn., continues northeasterly and may be approached close to with the exception of the vicinity of Knife Island. A rounded promontory reaching about 200 feet above the lake forms the west side of Agate Bay on which Two Harbors is located. A lighted radio relay mast on the promontory forms a very prominent landmark. No landings are available between these harbors.

Two Harbors (Agate Bay), Minn.—This harbor is an important ore-shipping point and a harbor of refuge. It is a natural bay or indentation about ¾ mile long and ½ mile wide. Before improvement, the bay had deep water at the entrance and throughout much of its extent, but was directly exposed to winds from southeast through south to south-southwest and to heavy swells from northeast and southeast winds. The city of Two Harbors, Minn., is located on the north side of the harbor.

Channels.—The harbor is entered from Lake Superior northward between a detached breakwater on the west side and a breakwater extending southwest from the east point of the harbor. A maneuvering area has been dredged in the eastern part of the harbor. In 1976, the controlling depth was 27 feet.

Aids to Navigation.—Two Harbors Light, 78 feet above the lake, on a red square tower with dwelling, stands on the point of land separating Agate and Burlington Bays; a radiobeacon is operated and the station has long-distance telephone connection and resident personnel but no ship-to-shore radio.

West Breakwater Light, 20 feet above the lake on a white mast, is located on the outer end of the breakwater at the harbor entrance.

East Breakwater Light, 32 feet above lake level on a white square pyramidal skeleton tower, is located on the outer end of the breakwater at the harbor entrance; an air diaphragm fog horn is operated at the light.

The inner three corners of the maneuvering basin are marked by buoys.

Harbor Facilities.—This harbor contains three active ore docks. A coal dock and a merchandise wharf are inactive. These docks are owned by the Duluth, Missabe and Iron Range Railroad. In June 1972, depths in the slips were 22 feet or more along ore dock No. 1, 28 feet or more along ore dock No. 2, 24 feet or more along ore dock No. 6, 22 feet between the coal and merchandise dock, and 18 feet along the outer half of the west side of the coal dock. No facilities are maintained for marine repair, fuel, etc., to recreational small craft. Along the easterly side of the basin, ruins of fishing docks and foul bottom exist. Small craft operators are advised to exercise caution in this area. Submerged ruins with 5 feet least depth, lie about 50 feet northerly of the west end of the west breakwater and about 800 feet westerly of the breakwater light.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Two Harbors, Minn., is contained in the **Port Series No. 49** (Revised 1974) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

From Two Harbors to Silver Bay Harbor, Minn., is a stretch of coast extending northeasterly for 27 miles and having very little shelter from storms. U.S. Highway 61 follows the coast in this reach. The coast is bold and may be generally approached within ½ mile, but a number of dangers lie close along this shore.

Burlington Bay, about 1 mile east of Agate Bay and the town of Two Harbors, is 1 mile wide and extends into the land 2,800 feet. The water deepens from the inner shore line to 60 feet and more at the entrance. The bay is considerably protected from southwest storms by the point of land lying between it and Agate Bay, but is subject to a wash from that direction. It is open to the south and east, but storms from these directions are very rare. It is partly protected from the northeast by the easterly point of land, but the northeast storms are so severe and the fetch of the waves so great that the sea rolls around into the bay with a good deal of force and renders it unsafe for vessels.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake crib of the city of Two Harbors is located from a point on shore 70 feet 131° from the easterly stack of the Municipal Water and Light Plant and extends 570 feet 131° to a crib with 60 feet of water over. It is unmarked. A second intake is located from a point on shore 140 feet 075° from the easterly stack of the Municipal Water and Light Plant and extends 190 feet 089° to a crib with 30 feet of water over. It is unmarked.

A rock shoal with 9 feet of water lies ¼ mile offshore at the mouth of **Silver Creek,** 4¼ miles northeasterly from Two Harbors Light. **Encampment Island,** 3 miles northeast of this rock and ½ mile from the shore, has a shoal

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with a depth of less than 12 feet extending west and northwest from it to the mainland. About 4 miles northeast of Encampment Island and about 1 mile east of the settlement of Castle Danger, a patch of rocks extends about ⅜ mile from the shore.

Gooseberry River, about 39 miles northeast of Duluth and about 13½ miles northeast of Agate Bay, is exposed to northeast storms. An extensive gravel spit extends southerly from its mouth. Good water exists up to the gravel beach, to which coasting vessels can proceed in quiet weather.

Gooseberry Reef, with 12 feet least depth, lies ½ mile from shore and 1 mile south of Gooseberry River, bearing southeasterly 3,600 feet from the extremity of Gooseberry Point. This reef forms the most dangerous obstruction to vessels coasting in this locality, and a careful lookout should be kept.

At the mouth of Split Rock River, 43 miles northeast of Duluth, there is a natural indentation affording shelter from westerly to northerly storms, some protection from northeast storms (the latter being the most dangerous at the westerly end of the lake), and less protection from southwest storms.

Corundum Point is about 1 mile northeast of Split Rock River and 7 miles southwest of Beaver Bay. There is no landing here.

Split Rock Light, abandoned in 1968, and located on a promontory about 1¼ miles northeast of Corundum Point and 22 miles northeasterly from Two Harbors was 178 feet above the lake on a buff colored octagonal tower with a white horizontal band. The area around and including the tower is now a part of the Split Rock Lighthouse State Park.

A detached rock shoal with least depth of 22 feet lies off Little Two Harbors (a small bay between Corundum Point and the abandoned Split Rock Light), at a position about 1,800 feet southeasterly from Corundum Point and about ½ mile southwesterly from the abandoned Split Rock Light. The reef drops off suddenly on its east side and gradually slopes into deep water in the opposite direction. It is out of the course of large vessels and is not an obstruction to lightdraft coasting vessels, but might prove dangerous to launches and similar small craft by reason of the swell or wave thrown up by the steep face on its east side.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake, located 2¾ miles southwest of Silver Bay Harbor, extends 1,000 feet southeasterly to a crib with 26 feet over. It is not marked.

Charts 14966, 14967.—Beaver Bay, about 51 miles northeast of Duluth, is an indentation extending into the coast line about 1,600 feet with greatest width of about 3,600 feet and area of about 120 acres. The shore is bordered by bluff's rising 75 to 200 feet above the surface of the lake, which affords shelter to some extent to vessels in the bay against storms from the south, west, and north. To the southeast, east, and northeast the bay is open and unprotected. The most dangerous storms experienced at this end of the lake come from a northeasterly direction, the sea then having an extreme fetch of more than 250 miles. The 16-foot depth contour is generally close to the shore line, at distances from it varying from 30 to 200 feet. Large boulders occur in all parts of the bay. There are two piers on the northerly shore of the bay, the westerly being 120 feet long with 9 feet of water at its outer end and the easterly being 55 feet long with 5 feet of water at its outer end.

Silver Bay Harbor, Minn.—This is a private harbor, developed and maintained by the Reserve Mining Company, on the north shore about 7 miles northeasterly of Split Rock abandoned light tower. The stacks on the powerhouse just north of the harbor are prominent landmarks in approaching the harbor.

The harbor is about ¾ mile long and ¼ mile wide with depths of at least 30 feet over most of its areas. The harbor is protected from the east and northeast by Beaver Island and a breakwater extending northwestward to shore from the north end of the island, and from the southwest by Pellet Island and a breakwater extending from it to the shore. In 1972, the controlling depth was 28 feet alongside the loading dock on the northwest side of the harbor. Shoaling to depths of less than 30 feet exists along the shore southwest of the dock.

Aids to Navigation.—The following aids, except for the marker radiobeacon, are privately maintained. Silver Bay Light, a rotary beacon, is located 126 feet above the marker radiobeacon, are privately maintained. Silver Bay Light, a rotary beacon, is located 126 feet above the water atop the boilerhouse on the mainland at the north end of the harbor. Beaver Island Light, 20 feet above the lake, on a tower, and a fog horn are located on the southerly portion of Beaver Island. Pellet Island Light, 25 feet above the lake, marks the northeasterly end of Pellet Island. Silver Bay Leading Light on a black pipe 6 feet above the lake, marks the southwesterly end of the loading dock. Two buoys mark the southerly and westerly limit of deep water in the southerly end of the harbor and a third buoy marks the southerly limit of shoal water off the end of the stub breakwater south of Beaver Island.

A marker radiobeacon, located 1,600 feet 286° from Beaver Island Light, is atop the storage silos on the loading dock.

Harbor Facilities.—A loading dock, 3,670 feet long, along the northwesterly side of the basin, provides facilities for the shipment of processed iron ore pellets and the unloading of coal, steel and fuel oil.

No facilities are maintained in this harbor for any craft except Reserve Mining Co. vessels.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Silver Bay, Minn., is contained in the Port Series No. 49 (Revised 1974) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Chart 14967.—From Silver Bay Harbor, the coast runs in a northeast direction 23 miles to Taconite Harbor. A bold rocky shore characterizes the coast with cliffs and

steep slopes to the waters edge and numerous points and inlets affording limited shelter. Although there are rocks and small islands within the shoal border, there are no known outlying hazards and the shore can be safely approached to within ½ mile. Several streams drain into the lake in this reach. The largest, the **Baptism River**, is about 5 miles northeast of Silver Bay Harbor and the area around its mouth has been developed as a State Park. U.S. Highway 61 follows the coast, generally less than a mile from shore and there are settlements along this route at **Silver Bay, Illgen City** and **Little Marais**, respectively, 1, 6, and 10 miles north of Silver Bay Harbor.

A radio mast about 4 miles northeast of Silver Bay Harbor and adjacent to the shore, stands just easterly of the summit of a prominent hill known as the **Palisade Head** and, being at an elevation over 200 feet above the lake and lighted by 3 red lights, makes a prominent landmark.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. The Silver Bay water intake is located about 1½ miles northeast of Silver Bay Harbor.

Taconite Harbor, Minnesota.—This is a private harbor maintained by the Erie Mining Company. The area inside the basin is about ¾ mile long, ¼ mile wide and is enclosed by breakwaters. **Gull** and **Bear Islands** and the mainland near the mouth of the **Two Island River**.

Gull Island, Bear Island, the breakwater between them, and the breakwater extending northeast from Bear Island protect the harbor from the southeast, and a breakwater extending southeast from shore at the north end of the harbor protects the harbor from the northeast. The harbor is entered from Lake Superior northward on the west side of Gull Island and is exited between the breakwaters at the northeast end of the harbor.

In 1972, the controlling depths were 27 feet in the entrance channel, 27 feet along the face of the dock on the northwest side of the harbor, and 29 feet in the exit channel. Depths inside the harbor range from 27 feet to over 50 feet.

Aids to Navigation.—Most of the aids are privately maintained. The west entrance is marked by a lighted range located on the mainland, also lights and buoys. The Range Front Light, 86 feet above the lake, is on the dockline and mounted on a building. The Range Rear Light, 144 feet above the lake on an aluminum tower, is 1,550 feet 028° from the front light. Big Boy Light, 65 feet above the lake, is shown from a red skeleton tower near the southwest end of Gull Island. West Entrance Light 4, 24 feet above the lake on an aluminum tower, is on the end of the short breakwater on the southeast side of the channel and West Entrance Light 3, 24 feet above the lake on an aluminum tower, is on the end of the short breakwater on the northwest side of the channel. A Coast Guard radiobeacon is maintained at Light 3. A buoy is located about 600 feet southwesterly of Light 3, and another buoy is located about 500 feet southwesterly of Light 4. The east entrance or harbor exit is marked on the west by East Entrance Light 5, 26 feet above the lake on a black tower, on the end of the breakwater extending northeast from Bear Island, and on the east by East Pierhead Light 2, 39 feet above the lake on an aluminum tower, on the outer end of the easterly breakwater. Three buoys along the southwest side of the easterly breakwater and one buoy 100 feet northeast of East Entrance Light 5 mark the limits of submerged riprap along the breakwaters.

Each of the three powerhouse stacks, which are located near the inner end of the easterly breakwater, is marked by two vertical red lights.

Submarine Crossing.—A submarine cable crosses the harbor entrance between lights 3 and 4.

Harbor Facilities.—About 2,400 feet of dock space is provided in the harbor for shipment of iron ore pellets and for receiving coal, steel and fuel oil. This is a private commercial harbor no facilities are available for pleasure craft.

Port Series.—The report containing detailed information on port and harbor facilities for the Port of Taconite, Minn., is contained in the Port Series No. 49 (Revised 1974) published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

From Taconite Harbor the coast runs in a northeast direction for approximately 31 miles to **Grand Marais** Harbor, Minn. The coast line in this reach of the lake is characterized by steep slopes and cliffs with elevations in excess of 900 feet above the lake within 1 to 2 miles of the shore. Two of the highest points are **Carlton Peak**, 4½ miles northeast of Taconite Harbor powerhouse and 926 feet above the lake, and **Leveaux Mountain** marked by a fire lookout tower, 8 miles northeast of the powerhouse and 950 feet above the lake. The coast may be approached close-to as no known hazards exist with the exception of **Rock Island**, a low rocky projection which lies about 3½ miles southwest of Grand Marais, at the easterly approach to **Good Harbor Bay**. It is about 1½ miles easterly of Terrace Point which is at the southwest side of the bay and about ¾ mile offshore.

U.S. Highway 61 continues within ½ mile of shore for most of the distance from Taconite Harbor to Grand Marais and passes through settlements at **Schroeder, Tofte** and **Lutsen** and along Good Harbor Bay, respectively, 1¼, 5, 12 and 26 miles northwest of Taconite Harbor.

Landings by light draft vessels can be made at these settlements. However, no shelter or dockage is provided and landings along the shore should be attempted only in calm weather. Tofte has the only useable launching ramp along this stretch of shore.

Several streams drain into the lake along this reach but none are navigable. The largest are the **Temperance River**, with its mouth 2⅛ miles northeast of Taconite Harbor, and the **Cascade River**, 9½ miles southwest of Grand Marais.

Potable Water Intake.—See 42 U.S.C. 264, published in Certain Laws, preceding, and 21 C.F.R. § 1250.93 of Rules and Regulations, preceding. A potable water intake pipeline of the village of Grand Marais, Minnesota, commences on the shoreline, 1,050 feet 280° from the West Breakwater

Light and extends about 300 feet 179° to an intake crib in about 40 feet of water. There is a depth of 37 feet over the crib and it is not marked.

Grand Marais Harbor, Minnesota.—Located about 105 miles northeast of Duluth, Minnesota, Grand Marais is a natural harbor which has been improved by the addition of breakwaters and by dredging. It is the only harbor with facilities and adequate protection for small craft in the 126 miles of exposed coast between Two Harbors and the International Boundary. The harbor consists of a semicircular bay with a practically uniform radius of ¼ mile, with an opening to the south and covering about 60 acres of water area. A small island (connected to the mainland) east of the southwest corner and a point extending to the west from the southeast corner of the harbor provide some natural protection across the opening.

The primary commercial use of the harbor is commercial fishing. The village of **Grand Marais, Minnesota,** fronts on the harbor.

Channels.—The harbor is entered from Lake Superior northward between breakwaters, extending from the west and east sides of the entrance, to a dredged harbor basin. An inner breakwater protects a dredged small-craft basin in the north part of the harbor. In 1970, the controlling depths were 16 to 20 feet in the main harbor basin except for shoaling to 14 feet in the northwest part, and thence in 1975, 8 feet in the small-craft basin.

Aids to Navigation.—The entrance is marked by Grand Marais West Breakwater Light 1, 36 feet above the lake on a black skeleton tower at the outer end of the west breakwater and Grand Marais Light, 38 feet above the lake, on a white square pyramidal skeleton tower at the outer end of the east breakwater. Grand Marais Harbor Inner Breakwater Light 7, 25 feet above the lake, on a white column is mounted on the easterly end of the rubble mound breakwater and marks the entrance to the small boat harbor. A radio station is maintained at the Coast Guard station.

Harbor Facilities.—The easterly section of the harbor, which includes the dredged basin of 36 acres, slightly enlarged by private dredging, is fairly well protected from all storms. There is fair anchorage for a few vessels in the dredged area. There are two wharves in the southeast corner, one partly in ruins, and neither of which is safe for mooring. Vessels are not permitted to tie to the breakwaters. The westerly portion of the harbor is shoal, exposed to southeasterly storms, and considerably exposed to swells from northeast storms. Vessels entering during a northeast storm should keep well over to the east breakwater to avoid getting into the shoal water to the west. Small craft can safely moor in the small-boat basin. Facilities at the small-boat basin marina include gasoline, diesel fuel, water, electricity, sewage pump-out, and limited supplies and repairs.

Coast Guard Station.—The North Superior Coast Guard Station is at the southeast side of the harbor, about 1,300 feet east-northeast of Grand Marais Light.

From the rocky point in the lake to the east of the harbor entrance a reef runs easterly for a distance of about 1,100 feet; it is narrow and has a depth of 8 feet near its outer end. A portion of this reef, lying from 200 to 500 feet from shore has from 13 to 24 feet of water over it.

From Grand Marais to Grand Portage Bay, about 34 miles northeasterly, the coast is rocky and bold, with deep water close to shore and a few outlying rocks. Owing to frequent fogs and the local disturbance of the magnetic needle in this locality, the coast should not be approached nearer than one mile. **Guano Rock** (Five Mile Rock), detached, lies 5 miles northeasterly from Grand Marais Light and ¾ mile off-shore. **Marr Island,** low and rocky, is on the outer end of a reef which extends 2,000 feet from the small point about 13 miles northeast of Grand Marais and about 1½ miles southwest of the mouth of the **Brule River.** A detached rock with 5 feet least depth lies about 3,500 feet southwesterly from the west entrance point of Grand Portage Bay and about 1,500 feet offshore. **Chicago Bay,** 18 miles, and Big Bay, 21 miles from Grand Marais, are the largest indentations along this reach and afford limited protection. U.S. Highway 61 continues close to shore for 24 miles before turning inland. A side road leads to Grand Portage Bay. The only settlement is Hovland on Chicago Bay where there is a small privately owned dock.

Charts 14967, 14968.—Grand Portage Bay.—This natural harbor is about 5 miles southwest of the International Boundary. It has a width of about 2 miles open to the lake and extends about 1¼ miles into the shore line. **Grand Portage Island,** about ½ mile long and ¼ mile wide, lies about midway between the outer end of **Hat Point,** a high rocky peninsula which forms the northeast side of the bay and the point at the southwest side of the bay and affords some protection from offshore winds. The island is on the outer edge of the shoal border and depths in most of the bay range from 6 to 12 feet. Boats drawing 8 feet or more should not approach nearer than ¼ mile from shore. There is no obstruction in the opening between the island and the point to the south, but a detached rocky shoal with a least depth of 6 feet lies about ½ mile east of the island and makes entrance through the opening to the north hazardous.

The area around the bay is occupied by the Grand Portage Indian Reservation. A small store and lunch counter is located near the ferry dock at the northwest side of the bay. Small passenger ferries run from this dock to several harbors on Isle Royale, Mich. There are privately owned crib docks in varying stages of repair along the north part of the bay.

Aids to Navigation.—Grand Portage Bay Entrance Light, 40 feet above the water, is mounted on a white skeleton tower near the tip of Hat Point.

Harbor Facilities.—Aside from the docks and store, there are limited facilities for small boats at a marina along the north and west sides of the bay.

Isle Royale Ferry Service.—The Wenonah is operated daily from mid-June through Labor Day in passenger service to Isle Royale National Park. The course from Grand Portage to Windigo in Washington Harbor is 106°. The return trip is on the same route on a 294° course. The Voyageur travels the same course June

through Labor Day from Grand Portage to Windigo on Mon., Wed., and Sat., circumnavigates the park and returns from Windigo to Grand Portage on Tues., Thurs., and Sun. The Voyageur operates on Wed. and Sat. schedule mid-May until June and Labor Day through October, returning to Grand Portage on Thurs. and Sun.

Just northeast of Grand Portage Bay and separated from it by Hat Point is **Wauswaugoning Bay.** The westerly corner of the bay is about 2 miles north northwest of the tip of Hat Point. From this corner the mainland shore continues northeast for 2 miles thence southeast ¾ mile and southwest ½ mile around a shallow bight, and southeast ½ mile to the southeast point of the bay. **Francis (Birch) Island,** small and rocky, lies just west of this point. The shore line of the bay along Hat Point is a continuous rocky cliff rising in places about 100 feet above the lake. **Mount Josephine,** with a height of 700 feet above the lake, is about ¼ mile west of the westerly corner of the bay. A 500 foot bluff with a boulder beach broken by cliffs extends along the northwest side of the bay.

The land to the northeast is generally low and heavily timbered. A rock shoal with an area of about 2,700 square feet and having a least depth of 5 feet lies about 1¼ miles north of Grand Portage Bay Entrance Light and about ½ mile off the westerly shore. A rocky reef surrounds Francis (Birch) Island and connects it to the mainland. Aside from these hazards and the shallows in the bight to the northeast, there are good depths and the shore is deep-to.

The bay has good holding ground for anchorage, but is exposed to the southeast, south and southwest. The bay is also protected from northeasterly winds by a group of islands of which Susie Island, Lucille Island and Magnet (Belle Rose) Island are the largest. The southwest end of Lucille Island, the outer island, is about 2 miles southeast of the southeast point of the bay and 2½ miles east of the tip of Hat Point. A dangerous detached rock lies ⅓ mile to the southeast of the southerly point of Lucille Island, and must be avoided. Care should be exercised in navigation between these islands.

From Wauswaugoning Bay the mainland shore continues east and northeast 2¼ miles to **Clark Bay,** a small inlet open to the east and protected on its south side by a point and two small islands extending about ½ mile from shore. Clark Bay is at the inner end of **Pigeon Point** a rocky peninsula which projects to the east northeast for 3½ miles and varies in width from ¼ to ½ mile. The mouth of the **Pigeon River** is about ½ mile, overland, north of Clark Bay.

Pigeon Point forms the south side of **Pigeon Bay** which is about 1 mile in width and 3 to 4 miles in length and bordered by high hills and/or bluffs which protect it completely, except to the east. The International Boundary passes through the bay and continues up the Pigeon River which enters at the southwest corner of the bay.

A dangerous reef with small islets, called **Boundary Island,** lies nearly in the middle of Pigeon Bay. It is about ½ mile long, east and west, and 360 feet wide. The outer end of a similar reef off the east end of a point which extends south and east from the north shore is about ½ way between the center of Boundary Island and the north shore of Pigeon Bay. This point, about a mile long, divides the inner portion of the bay into two arms.

Laura Grace Rock, with 6 feet of water on it, is very small and lies 3,400 feet 057° from the south entrance point of the Pigeon River. **Acadia Rock,** with 4½ feet least depth is also small and lies 1,400 feet almost due east of Laura Grace Rock. Outside these rocks and reefs the water in the bay is deep. Mariners should use it with great caution, as the rocks render the anchorage space dangerous and the holding ground is not good. A vessel requiring shelter in this locality will find it in **Little Trout Bay,** Ontario (about 6 miles northeast) in less than 60 feet, good stiff mud.

Section VII.—Isle Royale, Mich.

Charts 14968, 14976.—Isle Royale, Mich., and Vicinity.—Isle Royale has an extreme length from southwest to northeast of about 44 miles, and a maximum width, near the southwest end of about 9 miles. The highest point on the island is Mount Desor, 794 feet above Lake Superior. The rocky and irregular formation on its shores results in numerous indentions and detached islets and reefs, almost all with a northeast-southwest trend. Good lees can be found in many bays and channels.

The entire island and its surrounding islands constitute Isle Royale National Park established April 3, 1940, under the National Park Service, an agency of the U.S. Department of the Interior. The park is retained as much as possible in its natural state and there are no roads, only trails for hikers.

Recreational docks operated by concessions for the National Park Service at Rock Harbor, and at Windigo Ranger Station (formerly Inn) at Washington Harbor, offer groceries, gasoline, and water for the convenience of visitors. Small docks, generally in good repair and in sheltered areas, are maintained at the many campsites around the island, most of them having from 5 to 10 feet at their outer ends. Lights are operated on the docks at Windigo, Rock Harbor, and the Park Service Headquarters dock on Mott Island on the southwest side of Rock Harbor. Complete details regarding the island and its use are available from the Superintendent, Isle Royale National Park, 87 N. Ripley Street, Houghton, Mich. 49931.

Aircraft; Designated Landing Areas Regulations.—See 36 C.F.R. of Rules and Regulations, preceding.

Isle Royale Transportation Service.—During the summer months from June 15 through Labor Day, the National Park Service ship, M/V Ranger III, travels a round trip course of 004° from Keweenaw Upper Entrance to Rock Harbor Light and a return course of 184° from Rock Harbor Light to Keweenaw Upper Entrance several times each week.

Rock of Ages Light, off the westerly end of Isle Royale and about 2.4 miles west of the most westerly point of Washington Island, is 117 feet above the lake on a white conical tower; a diaphragm foghorn and a radiobeacon are operated at this station.

Fisherman Reef lies 5½ miles 236° from Rock of Ages Light, is unmarked, and has a least depth of 23 feet.

Five spots with depths of 7 to 16 feet lie from 1 to 1⅝ miles northeast of **Rock of Ages**, close to north of the line of approach from the light to Washington Harbor.

Wreck.—The wreckage of the **George M. Cox**, lost in 1933, lies in two sections on a reef about ¾ mile southwest of Rock of Ages Light. The bow section, with about 4 feet of water over it, is approximately ¾ mile 220° from Rock of Ages Light. The stern section is to the southwest of the bow in about 60–100 feet of water. This wreckage is not marked.

Several shoals with 3 and 4 feet least water exist within a distance of 1 mile to the south and southwest of Rock of Ages; the most southerly spot being marked by a buoy located 6,000 feet 198° from the light.

Grace Harbor and **Washington Harbor** at the westerly end of the island, are good, the former giving protection in all except southwest winds, with generally good holding ground, and the latter from all winds, with good holding ground. A peninsula terminating in Cumberland Point, the westerly extremity of Isle Royale, forms the southeast side and a row of islands, of which **Washington Island** is the largest and **Grace Island** the most easterly, forms the northerly side of Grace Harbor. The islands separate it from the outer portion of Washington Harbor. A rock, covered 2 feet and marked by a buoy, is about 1,500 feet west of Cumberland Point. Three buoys mark a passage with 20-foot depths, between the easterly end of Washington Island and **Booth Island**, connecting the two harbors. There is a spot with 2 feet depth ¾ mile southwest from Washington Island and on the north side of the entrance to Grace Harbor. The northerly side of the outer portion of Washington Harbor is protected by **Johns** and **Thompson Islands**. A shoal extends about ½ mile southwesterly and a detached shoal lies about ¼ mile southeast of Johns Island which is the westerly of the two islands. Entering Washington Harbor, there is a clear passage about ¼ mile wide between Washington Island and the shoals. Another shoal with 3 feet over it lies 700 feet west of the small island about 1,100 feet north of Grace Island. The inner 3¼ miles of Washington Harbor is formed between the shores of Isle Royale. At the inner end of Washington Harbor there is a crib wharf about 180 feet long with 20 feet depth at the outer end and 6 to 19 feet depth alongside. Gasoline, oil, water, and sewage pump-out facilities are available. Small craft may pass on either side of **Beaver Island** near the easterly end of the Washington Harbor. A rock awash 1,300 feet west of the south end of Beaver Island is a hazard to be avoided.

Isle Royale Passenger Service 1976.—The Wenonah is operated daily from mid-June through Labor Day in passenger service to Isle Royale National Park. The course from Grand Portage to Windigo in Washington Harbor is 106°. The return trip is on the same route on a 294° course. The Voyageur travels the same course June through Labor Day from Grand Portage to Windigo on Mon., Wed., and Sat., circumnavigates the park and returns from Windigo to Grand Portage on Tues., Thurs., and Sun. The Voyageur operates on a Wed. and Sat. schedule during mid-May until June and Labor Day through October, returning to Grand Portage on Thurs. and Sun.

There is deep water between Johns and Thompson Islands and between Thompson Island and Isle Royale. Thompson Island day-beacon with a white triangular slatted daymark, 40 feet above the water, is located on the northeast end on that island.

Wreck.—The wreck of the Steamer **America**, a 200-foot vessel which sank in 1929, lies about 200 feet off a small point on Isle Royale opposite Thompson Island. In 1975, a least depth of 2 feet was found over the wreck at the bow which is closer to the shore. The stern of the vessel is under 85 feet of water toward the channel. The easterly end of the wreck is marked with a buoy.

From this point the shore line of Isle Royale extends northerly for a mile to its northwesterly corner. The shore line is irregular and a small island and detached shoal are about ¼ mile offshore about ¾ mile north of Thompson Island.

The north shore of Isle Royale from **McGinty Cove**, about a mile from the westerly end, to Todd Harbor, a reach of about 19 miles, is bold and for the most part deep-to; but at a point about 6½ miles from McGinty Cove, two spots with 6 and 7 feet depths lie within ⅜ mile of the shore, and about 6 miles southwesterly from Todd Harbor there is an exposed reef ⅝ mile offshore, called **Gull Rocks**, not to be confused with Gull Islands which are farther east.

Todd Harbor, at about the middle of the north shore, parallels that shore line and affords good protection except in northerly winds. It has an indentation of about ¾ mile and a length of 5 miles. Care should be taken to avoid the many detached rock shoals in the harbor.

Between Todd Harbor and McCargoe Cove, a berth of 1 mile should be given the main shore to avoid the outlying shoal spots. **Hawk Island** is about ⅜ mile offshore in this stretch. A shoal with 3 feet depth lies about ⅛ mile north and a shoal with rocks awash lies about ¾ mile northeast of Hawk Island.

McCargoe Cove is a narrow body of water, about 2 miles long, running southwesterly into the north side of Isle Royale about 4½ miles to the eastward of Todd Harbor. A rocky shoal projects from the west point forming the entrance to the harbor. The easterly end of this shoal is marked with a buoy and the entrance is between this buoy and another buoy to the north-northwest, both maintained by the National Park Service. Coming around the rocky shoal, a vessel, to keep in 18 feet or more of water, must turn through 090° on a radius of about 200 feet. Fifteen feet of water is available in the channel leading into the cove, although at one place, opposite the northern part of **Birch Island**, this depth has a width of but 125 feet. After the island is passed, the average width is 500 feet and the depth of water 30 to 40 feet. A dock with deep water off its outer end is located at the southern extremity of the cove.

The northeasterly end of Isle Royale is of decidedly rugged and broken formation, consisting of many narrow peninsulas, islands, and ridges, all with a northeasterly

trend, and interspersed with narrow channels and bays of deep water. The bays and channel have numerous shoals and rocky reefs and islands which render navigation hazardous and make the use of a chart mandatory for safe passage. On the northerly side, after passing McCargoe Cove, the outer limits for a stretch of about 10 miles are marked by **Amygdaloid Island** and **Canoe Rocks** and a line of islands and reefs stretching between them. The **Amygdaloid Ranger Station**, near the southwest end of Amygdaloid Island, is in operation from approximately June 1 through Sep each year. **Amygdaloid Channel**, about ¼ mile wide, parallels the south side of Amygdaloid Island and is separated from **Robinson Bay** by a narrow peninsula, Belle Isle, **Green Island** and a series of small islands and reefs. The easterly end of **Belle Isle** has a dock on the southerly or Robinson Bay side with deep water to its outer face. **Hill Point** is at the southerly side of the easterly end of Robinson Bay and separates it from **Five Finger Bay** which is bounded on the south by the peninsula terminating in **Locke Point**. The northeast limit of rocks and shoals off Locke Point is marked by a buoy. The entrance to Duncan Bay, which extends 4½ miles to the southwest, is between Locke Point and Blake Point.

Blake Point is marked by Blake Point Light, 40 feet above the lake on a white skeleton tower; the light shows a red sector from 090° to 105° which covers the above mentioned Canoe Rocks and adjacent shoals. An 11-foot shoal, marked by a buoy on its northerly side, lies 1,500 feet 063° from Blake Point Light. To the east of the point are two shoal spots, one about 4,900 feet with 4 feet of water and one about 6,000 feet with 13 feet of water, which must be carefully avoided; a buoy marks the southerly side of the 4-foot spot.

Wrecks.—The wreck of the Steamer **Emperor**, which struck Canoe Rocks and sank on June 4, 1947, when last reported visible above water on November 11, 1947, was in a position about 3¼ miles 281° from Blake Point Light. Reports in 1975 indicated the wreck has a least depth of about 35 feet over it.

A wreck is located about 4¼ miles 272° from Blake Point Light, on the Canoe Rocks.

Passage Island Light, 78 feet above the lake, on a gray octagonal tower, standing on the southwesterly point of **Passage Island** and about 3½ miles northeasterly from **Blake Point**, marks the passage between it and Isle Royale; a fog signal, radiobeacon, and radar transponder beacon (RACON) are at the light. (See Light List for details.)

From **Passage Island Light**, the **Gull Islands** lie about 5¼ miles northeasterly, and **Bateau Rock** (exposed) about 12½ miles northeasterly. There is a shoal, awash, ½ mile south of the Gull Islands. A group of detached rocky shoals with from 7 to 12 feet depths lie within distances of from 1 to 2½ miles northwesterly of the Gull Islands and from 3 to 4 miles northeasterly of Passage Island; vessels should avoid this locality. A shoal with 8½ feet depth lies ½ mile westerly, and a dangerous submerged rock lies ⅓ mile east of Bateau Rock.

Duncan Bay is an inlet at the northeast end of Isle Royale, on the northerly side of the peninsula terminating in Blake Point; it opens to the northeast and is about 2,000 feet wide at the entrance. The bay is divided at about 1 mile from the entrance by a point extending northeast in the general direction of the inlet, forming a bay on the north side about 500 feet wide and ½ mile long, with depths of from 78 feet to 24 feet at the head, rock bottom, and 18-foot contours close to shore. The main inlet continues south of the point, gradually narrowing to a contracted passage, with a midchannel reef in the narrow portion and passage to the south side when entering, leading to a large bay beyond; depths vary from 126 feet at the outer entrance to less than 12 feet near the contracted passage to the inner bay, with a rocky bottom. There is a 17-foot shoal about 400 feet northeast of a small island near midchannel south of the point.

Tobin Harbor, parallel to the south of Duncan Bay, gives protection from all winds, with good holding ground, but will admit only small craft because of its narrow entrance. **Scoville Point** is at the northeast end of a narrow peninsula along the southerly side of the harbor. Tobin's dock is about 100 feet long and vessels drawing 12 feet can reach it; the dock was rebuilt in 1959 and is in good condition.

Passenger Service.—The Isle Royale Queen II is operated Monday and Friday from mid-May until mid-June and daily except Sunday from mid-June through Labor Day in passenger service to Isle Royale National Park. The course from Copper Harbor Light to Scoville Point on Isle Royale is 330°. The return trip is on the same route on a 150° course.

Rock Harbor, to the southward of Tobin Harbor and extending in the same northeast-southwest direction, is about 13 miles long, of which length about 9½ miles is enclosed from the lake by a chain of islands and shoals. It is an excellent harbor, affording protection from all winds, with good holding ground and ample depths, and having several good small boat docks.

In the approach to the eastern entrance, a sharp lookout should be kept for the shoal spots 6,000 feet east of Blake Point. There is also a wide and deep entrance from the south, opposite Scoville Point near the outer end of the harbor. A white daymarker marks the easterly tip of Scoville Point.

The **Middle Islands Passage** into the harbor, near the inner end of the island chain, has an available depth of 26 feet and is marked by a lighted bell buoy and two unlighted buoys. On the northwest end of Caribou Island, at the east side of the inner end of this passage, the National Park Service maintains a light not visible to small craft which approach the passage from the northeast to southeast because of trees on Caribou Island and on the small islands southeast of the light.

At Rock Harbor, in a bight on the northerly side of Rock Harbor, about 4 miles from the eastern entrance, there is a 200-foot long wharf with 13 feet alongside. Gasoline, diesel fuel, oil, water, and electricity are available. Adjacent to the wharf, are several finger piers to accommodate small craft. At the westerly end of the point

which forms the southerly side of the bight, there is a crib wharf in fair condition 57 feet long, with depth of about 18 feet at its southeast end and 16 feet toward the northwest end; a 12-foot spot 300 feet west of the dock, marked on the westerly edge with a buoy in 18 feet of water, should be avoided. At the National Park Headquarters on **Mott Island**, in central Rock Harbor, there is a crib wharf about 380 feet long, along shore, with depth of 20 feet at the outer end, decreasing to 13 feet at midlength; the inner half will accommodate small craft. Gasoline, sewage pump-out facility, and a hoist capable of hauling out craft up to 60 feet in length for emergency repairs are available. The fully inclosed westerly 3½ miles of Rock Harbor is obstructed at midlength by shoals through which there is a 13-foot passage, marked by buoys.

From Middle Islands Passage, the Isle Royale shore line extends south for about 2 miles before continuing its trend southwesterly for 23 miles to the head of Siskiwit Bay which parallels this shore. The bay, which varies from 1½ to 3¼ miles in width and is about 12 miles long, is protected on its southerly side by a peninsula and a chain of islands and reefs.

The coast from Middle Islands Passage (Rock Harbor West Entrance) to Chippewa Harbor is free from known hazards outside of the shoal border which extends in a few places to about ¼ mile offshore.

Conglomerate Bay, about 1 mile south of Rock Harbor West Entrance Light, has deep water and offers good protection from all winds except from the east.

Chippewa Harbor, an indentation on the south shore of Isle Royale about 6 miles southwest of Rock Harbor West Entrance, opens to the southeast, with a general width of about 650 feet for approximately 1,750 feet from the entrance, where the shores contract to a dredged passage 75 feet in width and 14 feet deep, leading to inner harbors. The water in the outer harbor varies from 120 feet at the entrance to 36 feet near the head, with rock bottom.

From Chippewa Harbor the coast is free from outlying hazards for about 6 miles to **Schooner Island** where a shoal makes out to about ½ mile offshore. The island is at the north side of the mouth of Siskiwit Bay.

Malone Bay immediately west of Schooner Island is an indentation about 3½ miles wide, and is open to the south except for the shelter of **Hat, Ross, Malone and Wright Islands.** Shoals adjoining these and several other small islands as well as isolated shoals in this area render navigation hazardous.

A channel with 18 feet depth between four buoys marking dangerous shoals on each side of the channel, is useful to small craft seeking shelter in Malone Bay behind Wright Island, and is marked by a range of three targets, each in the form of a white diamond above a black diamond on the shore of Isle Royale, in alignment of about 311°. The harbor with depths of 36 to 48 feet, mud and clay bottom affords excellent protection from all winds. The Malone Bay Ranger Station is operated from about June 1 to September 30 each year at a point about ¾ mile east of the range targets into Malone Bay.

Hopkins Harbor, at the westerly end of Malone Bay, is a sheltered inlet in the west end of Wright Island and has a 60-foot long wharf paralleling shore on its south side, 15 feet of water is available along the wharf, but care must be exercised when entering the harbor to avoid a boulder shoal which projects halfway across the entrance from the north side.

Siskiwit Bay, is the largest indentation in the island and affords protection from all winds excepting those from the northeast to east, with good holding ground 1½ miles south of Wright Island; there is foul ground within 1 mile off this island. The bay is inclosed on the south by the peninsula terminating in **Point Houghton** and by a double line of inlets and reefs stretching from the point 8 miles northeasterly about parallel to the south shore of Isle Royale; in general, no attempt should be made to enter between the islets. About ⅝ mile east of Point Houghton there is a passage into the bay with an available depth of 17 feet, marked by a black and white vertically striped lighted bell buoy, and other buoys. Harlem Reef, with 2 feet least depth, lies detached to the south of the islet chain about 3 miles east of Point Houghton and is marked with a buoy in about 22 feet of water to the south of the 2-foot mark. A dock about 5 miles west of this entrance at the head of the bay has 6 feet of water at its outer end.

Isle Royale Light, 72 feet above the lake on a white octagonal tower is on **Menagerie Island**, the outermost island of the islet chain on the south side of Siskiwit Bay.

A detached 4-foot spot lies about 3,400 feet northeasterly from Isle Royale Light, and an 18-foot shoal lies about 6,800 feet northeasterly from the light and 3,350 feet beyond the 4-foot spot.

The south coast of Isle Royale from Point Houghton westerly 13 miles to the most southern point of the island, The Head, should generally be given a berth of at least 1 mile because of the existence of ledges and rocky spots, rendering the coast very dangerous. However, about one mile southwest of Point Houghton is a small cove called Fishermans Home. This sheltered cove contains a commercial fishing operation with two docks. The entrance is very deceptive and requires careful navigation. At the constriction, the only passage is against the starboard bank in a channel about 15 feet wide and about 5 feet deep.

From the south point, The Head, the shore line trends northwesterly for about 4 miles past **Rainbow Point** to **Cumberland Point.**

Section VIII.—Northwest Shore From Pigeon Bay to Thunder Cape, and Including Thunder Bay, Ontario

Charts of Canadian waters are prepared by the Canadian Hydrographic Service, Department of the Environment, Ottawa, Canada

Chart 14968.—Pigeon Bay to the city of Thunder Bay (formerly Port Arthur), Ontario.

Time.—Lakeshore areas of the Canadian Province of Ontario observe eastern standard time or eastern daylight saving time. Areas south of the Pigeon River on the west shore of Lake Superior observe central standard time or central daylight saving time.

Pine Bay, into which Pine River empties, is a shallow indentation 1¾ miles north of Pigeon Point. It is difficult of access, but contains good shelter and holding ground for small craft. **Pine Point**, 3 miles northeast of Pigeon Point, is steep-to on all sides and forms the southeast entrance point to Big Trout Bay, which contains excellent shelter from all but northeast and east winds. The anchorage, however, is nearly all over 60 feet, but the shores are clean. Directly in the entrance to the bay there was found in 1916 a narrow shoal ridge rising in 60 feet of water, with a least depth of 9½ feet at a point 1 mile northeasterly from the east extremity of Pine Point.

Cloud Islands, three in number, with **Pinnacle Rock** ⅜ mile northeast, lie at the northeast side of the mouth of **Big Trout Bay**. A very shallow spit makes out 750 feet southwest from the south island, and a rock with 7 feet over it lies 450 feet northeast of the north island. With these two exceptions, the shores of the islands and the detached rock are quite clean.

McKellar Point, 3 miles northeast of Pine Point, is steep-to on all sides and is the east entrance point to **Little Trout Bay**, with clean shores, excellent anchorage in less than 60 feet, and shelter from all winds. **Cloud Bay**, 1¼ miles northwest of McKellar Point and really an arm of Little Trout Bay, contains limited anchorage space in its middle, the shores being shallow. At the mouth of **Cloud River**, which runs into **Cloud Bay**, there is a small public wharf. **Sucker Island** is a small island 2 miles northeast of McKellar Point. It is surrounded by shallow water for a distance of 600 feet. The shore between it and Cloud Bay is steep-to. **Caldwell Island**, ½ mile east of Sucker Island, has very little shallow water off it.

Caldwell Point, a low gravel point covered with grass bears northeast 3 miles from McKellar Point and 1¼ miles northeasterly from Victoria Island Lighthouse. It is important on account of the small rock with 4 feet of water over it, lying 1,500 feet southerly from it; a red spar buoy marks this danger.

Jarvis Point lies 1½ miles northeast of Caldwell Point, and between them is a slight indentation with steep shores; the point is steep-to on all sides. **Jarvis Bay** is an indentation about a mile square lying to the northward and westward of Jarvis Point. In the north corner, called **Prince Bay**, will be found shallow anchorage for small boats, and in the southwest corner limited space for large craft. **Mink Point**, also steep-to, lies 2¼ miles northeast of Jarvis Point and is marked by a light on a 30-foot lattice tower.

Mink Island, 1⅝ miles long, quite narrow and high, lies 2,250 feet northeasterly of Mink Point. The island has deep water all around it, and the channel between the point and island is deep and clean. **Sister Islands**, two in number, lie ¾ to 1¼ miles northeasterly of the northeast end of Mink Island; they are steep-to on all sides. A rock, unmarked and with less than 6 feet of water over it, lies in the middle of the passage between Mink Island and the Sisters. **Sly Rock**, with 3 feet over it, lies 1,500 feet northeasterly of the northeast Sister Island.

Sturgeon Point, marked by a small islet off it, is situated 2⅝ miles northeasterly from Mink Point; it also is steep-to. The bay between its shore and Mink Island is called **Mink Bay**, and contains good anchorage in its southwest corner, between the two small islets there. **Sturgeon Bay** is a shallow bay with a narrow entrance, 1 mile west of Sturgeon Point. Off the north shore of Sturgeon Point will be found good anchorage. Northeasterly 3,600 feet from Sturgeon Point, and 1,200 feet southerly off the shore abreast of it, is a small boulder shoal, with only 2 feet of water over it, called **Zealand Spit**.

Flatland Island, 2¾ miles northeast of Sturgeon Point, is, in marked contrast to all the other islands in the vicinity, low and flat. From its southwest point, a reef and a long, narrow island almost connect it with the mainland at **Wyllie Point**, but off the west side is an excellent harbor, with from 18 to 24 feet of water in it; the entrance being from the north between **Birch Island** and the mainland. From the southeast point of Flatland Island several small islands and rocks extend in a northeasterly direction for a distance of ¾ mile, the outer one, called **Campbell Island**, being clean at its north end. **Alexander Reef**, a detached reef with scant water on it, lies 2,000 feet southeasterly from the southeast point of Flatland Island and 2,000 feet southerly from Campbell Island. A dangerous reef, with only 4 or 5 feet of water at its outer end, extends 1¼ miles northerly from the north side of Flatland Island, to clear which on the north end, keep the lower bluff on Thunder Cape in sight north of Pie Island, bearing 075° and to pass east keep Spar Island open east of Flatland Island, bearing 188°26′.

The mainland shore from Birch Island 6½ miles northerly to Grand Point is clean except for **Squaw** and **Brule Bays** (near Grand Point), in which the water is not very deep. There is a small public wharf located on the north shore of Squaw Bay. **Grand Reef**, a very shallow bank about 700 feet wide and marked on its easterly side by a buoy, lies about ¼ mile off **Grand Point** leaving good water inside. From Grand Point to Thunder Bay the shore is fronted by a shallow mud flat for an average distance of ¾ mile. The principal mouth of the Kaministikwia River and an entrance to the city of Thunder Bay (formerly Fort William) is situated 6 miles north of Grand Point.

Welcome Islands, four in number, lie about 4 miles southeast of the south entrance light on the south breakwall forming the main harbor of Thunder Bay. The northern two are each about ½ mile long and ¼ mile wide, and are about ¼ mile apart. The other two are quite small and are situated on a shoal bank reaching about ⅞ mile south from the western one of the two main islands; the extremity of this bank is marked by a buoy. Shoal water extends ¼ mile off along the south side of the eastern island, and in the bay on the east side of the group are two shoals with 8 and 10 feet over them, ½ mile offshore; the northerly shores are clean. The channel between Welcome Islands and **Mutton Island**, off the mouth of Kaministikwia River, is 1¾ miles wide and from 21 to 48 feet deep. A light is located on the northeastern extremity of the eastern Welcome Island. **Schwitzer Shoal**,

with 18 feet of water on it, lies northeasterly 3½ miles from Welcome Islands Light.

Victoria Island is the southernmost of a long narrow string of islands that stretches from Little Trout Bay northeasterly nearly to Thunder Cape, a distance of 27 miles, and gives shelter to an excellent channel from Victoria Island to Thunder Bay harbour (formerly Port Arthur). The extremity of the west point on the northerly side of the island is marked by a lighthouse exhibiting a light visible from 022° through east and south to 241°. Off the point a shallow reef extends 450 feet in a southwesterly direction. This is especially dangerous for vessels entering or leaving the inside passage, as it juts into the channel; it is marked at the outer end by a buoy. **Cosgrave Bay**, south of the lighthouse point, is rather deep for anchoring, but the shores are clean.

Iroquois Rock, with 4½ feet of water on it, lies 3,000 feet southwesterly from the lighthouse point and is a dangerous rock, leaving a deep channel over 2,100 feet wide between it and the reef off the lighthouse point. As the rock is very small, vessels may pass upon either side of it; it is marked by a buoy. To pass north of it, keep Sugarloaf Hill on Spar Island in sight north of Victoria Island, 066°06′, and to pass south of it, bring the northwest side of Spar Island in line with Victoria Island Lighthouse, 059°04′. **Tiger Island** is the high black island lying ⅜ mile south of Victoria Island Lighthouse. It and the small island stretching 2 miles east of it are quite clean. **Victoria Cove** is a large bay in the east side of Victoria Island, but the water in it is about 80 feet deep. A couple of shallow rocks lie off **Rolland Rock** (dry) at the southeast entrance to this cove: one is 900 feet northeast and the other 450 feet south of it. Another rock with only 2 feet of water over it lies nearly in the middle of the entrance to the cove and must be carefully guarded against by keeping rather nearer the southwest side. The remainder of the south and all the north shore of Victoria Island are quite deep-to.

Devil and Jarvis Islands, with a few islets, are next in line northeast of Victoria Island, extending to Spar Island. They are quite clean off their northwest and southeast sides. A narrow channel with 20 feet of water in it exists between Devil and Jarvis Islands. **Spar Island** is about 2½ miles long northeast and southwest by ½ mile wide. **Spar Reef**, a rock awash, lies with its outer edge ¼ mile off a point on the northwest side and ¾ mile from the southwest end. With this exception the shores are clean. There is a safe, clean passage ¼ mile wide through the islets between Spar and Jarvis Islands, with 75 feet of water in it.

Thompson Island lies with its southwest end 2⅛ miles northeast of Spar Island; it is 3⅞ miles long northeast and southwest by ⅜ mile in greatest width, and is over 250 feet high, with deep water all around it. In the gap between Spar and Thompson Islands are numerous small islands and rocks, dry or sunken, with good passages between them, but which should not be attempted by strangers without a chart. Stretching northeast from Thompson Island for ¾ mile to **McKellar Island** are several small islands with no passages between them, but which have good, clean shores on either side. The gap between these islands and Pie Island is very deep and clear of obstructions.

Pie Island, rising 850 feet high, is about 7 miles long east and west by 4 miles wide, and has only slight indentations in its shores, except the southerly. The shores are clear of dangers, except the north and northeast, which should receive a berth of half a mile. Good anchorage from southerly winds will be found on the north and northwest sides, and from northerly winds off the south side. **Dawson Bay** in the south side is large, but the water is deep. The light on Pie Island is on the west side, immediately west of **Le Pate**, the highest part of the island. The light, which is mounted on a white steel tower, is visible from all points of approach except where hidden by the high land of Pie Island east of it. **Steamboat** and **Deadman Islands** are small and lie from 1 to 1¼ miles off the southwest side of Pie Island. They are clean outside a distance of 600 feet, and between them and Campbell Island and Alexander Reef is a good, clean passage 4,500 feet wide and from 30 to 50 feet deep.

Angus Islands, Hamilton Island, and Cone Island are a small group, 6 in number, lying 1 mile southeast of the east point of Pie Island. Angus Island Light, shown 81 feet above the water from a galvanized steel skeleton tower on four concrete piers, is located near the northerly end of the islands, at the southwest side of the entrance to Thunder Bay; a fog horn and a radiobeacon are operated as required. There is a shallow spit making out ¼ mile northeast from the north end of Angus Islands, and with this exception the islands are clean. To the south westward of the group and abreast of the southeast side of Pie Island are several shallow rocks, as follows: **Craig Rock**, awash, lies westerly 6,000 feet from Cone Island (a high bare peak and the southwestern one of the group above mentioned); an exposed rock lies about 4,600 feet off the island at a point 3 miles southwesterly from Angus Island Light; **Baker Rock**, with 3 feet of water on it, lies east 10,500 feet from the south point of Pie Island; and **Lord Stanley Rock**, the most important, with 4 feet of water over it and a 7-foot spot close southwest of it, is situated southeasterly 7,500 feet from the same point.

The passage between Pie Island and **Thunder Cape**, 5½ miles wide, is quite clean. Thunder Cape is a very prominent headland, marking the east entrance to Thunder Bay. The cape is 1,000 feet high near its south end and 1,200 feet on the summit of the Sleeping Giant, as the high land between Sawyer Bay and the cape is called. Upon its south end is shown a light, 35 feet above water. All parts of the cape may be approached to 600 feet.

Hare Island, Ont. is small, 20 feet high, bearing northwest 1¾ miles from the cape. Shoal water extends southwesterly 2,500 feet from its south end, and a shallow rock with 10 feet of water over it lies westerly 1,000 feet from its north end. Otherwise the island is clear outside a distance of 450 feet. A buoy is moored 2¼ miles 264½° from Thunder Cape Lighthouse, on the southeast side of a patch having 22 feet of water over it, and on the south-

west of a patch having 18 feet of water over it. Vessels should pass to southward of the buoy.

In the approaches to the city of **Thunder Bay** (formerly the cities of Fort William and Port Arthur), Ontario, vessels proceeding from the eastward should pass to southward of Thunder Cape and Hare Island lighted buoy, and then shape a course to pass ½ mile clear of the northeast end of the Welcomes.

An alternate route rather than a regular shipping lane for commercial vessels is utilized only by smaller vessels, primarily pleasure craft, and is described as follows up to the Lakehead Harbour, Ont. description:

Vessels from Duluth for the city of Thunder Bay in thick weather keep clear of Isle Royale and enter close to Thunder Cape. In clear weather, vessels trading between the city of Thunder Bay harbour and Duluth use the shorter and more sheltered passage west of Pie and Victoria Islands. From Duluth to the city of Thunder Bay, shortly after passing to the east of Cloud Islands, bring the west side of Sister Islands in line with Caldwell Point, 045°, to pass between Iroquois Rock and the reef off Victoria Island. If these marks can not be distinguished and there is no buoy on Iroquois Rock, a vessel should haul close to Tiger Island and steer to pass 900 feet off Victoria Island, until the east end of Tiger Island comes in line with the west or lighthouse point of Victoria Island. Now alter course to pass about 600 feet off the north side of Victoria Island to avoid the 4-foot shoal off Caldwell Point. When abreast of Caldwell Point, steer for the northwest side of Spar Island for 2½ miles, or until the west side of Pie Island comes in line with the west side of the Sisters, bearing 033°45′—keep on this range for 3¾ miles. This will clear the rock awash, marked by a concrete beacon, between the Sisters and Mink Island. Pass through the passage, giving West Sister a berth of 600 feet, and head up for the west side of Pie Island, bearing 033°45′, steering thus for 6 miles until Pie Island Light comes abreast, then haul up 004° for 10 miles to give Welcome Islands a berth of half a mile. As soon as the north end of the latter islands comes abreast, a vessel may alter course for the desired berth in the harbour. At night, those locally acquainted pass between Mink Point and Mink Island, giving the latter a berth of 660 feet, and haul up for Pie Island Light bearing 045° until Deadman Island comes abreast, when they haul up for the Welcomes. Mink Point is marked by a light mounted 30 feet above the water on a steel tower.

Leaving the city of Thunder Bay (Lakehead Harbour), when clear of the entrance, head for the south end of the Welcomes until about ½ mile from them. Then steer to pass the same distance off the west shore of Pie Island or heading for Deadman Island. When Pie Island Light comes abreast, haul for the gap between the Sisters and Mink Island, giving the west end of West Sister a berth of 600 feet to avoid the rock awash between it and Mink Island. Now bring the west side of Pie Island in line with the west side of the Sisters, heading for the west end of Jarvis Island. As soon as the north side of Cloud Islands comes in line with Victoria Island Lighthouse, 236°15′ keep it so, rounding the lighthouse point at a distance of 900 feet, taking care not to pass northwest of the line, north side of the Sisters in one with Caldwell Point, to avoid Iroquois Rock.

Lakehead Harbour, Ont.—In 1970, the cities of Fort William and Port Arthur were amalgamated into one new city called the city of Thunder Bay. The harbor of the city of Thunder Bay is officially known as the Lakehead Harbour, and is administered by the Lakehead Harbour Commission. It is one large harbor development, comprising diversified types of improvement over an extensive area of river channels and lake frontage protected by breakwaters. It extends roughly from the north limit of the city located about 1½ miles northerly of Bare Point southerly to Whiskeyjack Point. It is the Canadian western terminus of Great Lakes navigation, and Lake Superior terminals of both Canadian National and Canadian Pacific Railways. It is the great shipping port for the Canadian northwest. Copies of bylaws for the control of the Lakehead Harbour may be obtained on application to the Port Manager, Lakehead Harbour Commission, P.O. Box 266, Thunder Bay, Ontario P7B 5E8. The city has many waterfront activities, the most noticeable of which are the 21 grain elevators with a total capacity of approximately 100 million bushels. Icebreakers are employed in the harbor to lengthen the period of navigation both in the spring and fall.

Radio Facilities.—A marine radio station at Thunder Bay, call sign VBA, is operated continuously during the navigation season. Extended range ship-shore VHF transmitting and receiving facilities at Sibley, Ont. and Slate Island, Ont. are remotely controlled from this station.

Marine Radio Station VDX 30, Lakehead Control, is maintained by the Lakehead Harbour Commission primarily as a marine traffic control and information center for Lakehead Harbour. All ships entering, moving about, in or leaving Lakehead Harbour must report to this station indicating their destination within the harbour and routes to be traversed, their last port of call and/or their destination on leaving the harbour. Customs, ambulance, police and fire services may be most easily obtained within Lakehead Harbour through this station. It is manned 24 hours per day throughout the shipping season.

The Lakehead Harbour is generally divided into two sections, the southern and northern sections. The southern developed section is generally contained within the river channels, while the northern developed section fronts the northerly half of the city, and is protected by a breakwater.

The main river forming the harbor in the southern section is the **Kaministikwia River**, which has been dredged to a grade depth of 25 feet to and including the Westfort Turning Basin, a distance of approximately 5¼ miles above its mouth. Within 2½ miles of its mouth it forks twice, the two subsidiary outlets being known as the Mission and McKellar Rivers, respectively. These rivers empty into Thunder Bay about 2¾ miles and 1⅛ miles southerly from the main mouth. The shoals extending offshore in the vicinity of the mouths of the three rivers are formed of sandy silt, having a very gentle slope, so that small boats may ground as far as ½ mile out.

Extensive dredging operations by the Canadian Government have provided three entrance channels through the bar at the mouths of the Kaministikwia, McKellar and Mission Rivers, and have deepened and widened channels in the three rivers and provided basins for the use of vessels. The improved river channels have in the aggregate a length of 14 miles and an available dock frontage of 22½ miles, about one-third of which has been utilized. The depths in the harbor channels are subject to continual change due to silt and scour, but are reported to be maintained to a least depth of 23½ feet except in some marginal areas and the entrance channel to the McKellar River.

The Kaministikwia River entrance channel through the bar at the mouth is 5,000 feet long. A rubble mound breakwater 2,000 feet long has been constructed approximately 600 feet southerly of, and approximately parallel to, the entrance channel. The river channel has been deepened and widened for 5 miles upstream from the mouth and two turning basins provided, one at the junction with Mission River and one at the upper limit of improvement at Westfort. There are two bridges across the river, the Canadian Pacific Rail bridge, about 2 miles from the mouth, with clear available span of 125 feet, and the Canadian National Railway (Westfort) bridge, about ½ mile below the Westfort Turning Basin, with clear span of 100 feet. Immediately above the Westfort Turning Basin, the river has been deepened on the northwest side to form a slip at the timber dock of The Great Lakes Paper Co. It was reported in May 1978, that silting had occurred in the Kaministikwia River between the C.N.R. swing bridge and the Great Lakes Paper Co. dock. Depths shallower than indicated on local charts will be encountered.

The McKellar River is 1½ miles long, and is crossed by a bridge of the Canadian Pacific Rail, with clear span of 106 feet. It has a general width of 350 feet, except for the reduced width through the bridge span and except in front of the C.P.R. coal dock at the mouth, where the width is 450 feet. An entrance channel to Thunder Bay, 6,000 feet long and 300 feet wide, having a limiting depth of 18 feet, has been dredged through the bar at the mouth. The entrance to the McKellar River is marked by a range of lights mounted on steel towers. The channel is well marked with buoys. Since 1964, the McKellar River and entrance channel are no longer maintained by dredging, and depths of less than 18 feet may be encountered.

The McKellar River Lift bridge (C.P.R.) is no longer manned at any time unless a ship wishes to pass through, at which time an operator is dispatched. Vessels requiring to pass through the bridge should contact the Lakehead Harbour Commission Control Office VDX 30, Lakehead Control (FM), allowing at least 1½ hours' notice.

The Mission River is about 2 miles long, and has a general width of 400 feet. On the south side just within the mouth is a turning basin dredged to a 27-foot grade depth, on which are located Canadian National Railway terminals and grain elevators and the plant of the Abitibi Power and Paper Co. In the turning basin, a shoal formed by the sewer discharge of the paper company is properly buoyed. An entrance channel 7,000 feet long and 450 feet wide extends through the bar at the mouth. This entrance channel and the river have been dredged to a 27-foot grade depth up to the upstream end of the Valley Camp Pellet Terminal. A revetment wall is built along the southerly side of the channel and extending southerly from the outer end of the revetment wall and at right angles thereto, a breakwater has been constructed, comprising a length of 1,330 feet of cribwork substructure on pile foundation and with concrete top, and a length of 1,000 feet of rubble mound, the two sections being separated by a gap of 375 feet.

The northern section of the harbor, fronting the city, is a waterfront of approximately 5 miles in length, and extends north from the Kaministikwia River to **Bare Point**. This section of the harbor is protected by breakwater. There are three entrances through this breakwater, located about equally distant along its length. Channels with depths of 27 feet exist through the three entries of the breakwater. Irregular shaped channels and basins dredged to 27 feet exist inside all three entries to the breakwater, providing access to most of the waterfront activities. Slips of various elevators and other waterfront industries have varying depths, and Masters should check with each industry to determine the exact depth of water which does exist.

Outside of the breakwater and northerly of Bare Point is located the Abitibi Power and Paper Co., Thunder Bay Division. It is reported that they have a slip 1,500 feet long, 150 feet wide, and 18 feet deep, the entrance of which is marked by buoys on both the easterly and westerly sides.

The former Canadian Pacific Rail facilities inside the breakwater are now under control of the city of Thunder Bay, and the area was converted to a pleasure craft marina in 1968. A floating steel and wooden pontoon type breakwall standing approximately 6 feet above water level and bearing reflector tape has been installed from the easterly end, north side, of the main dock, northerly for a distance of 180 feet, thence westerly for an additional 180 feet. Small craft slips and floating docks have been installed along the main wharf for the convenience of pleasure craft owners.

The breakwater protecting the northerly section of the harbor is described as follows: rubble mound, commencing at Bare Point it extends 1,188 feet 171°, thence 2,083 feet 218°30′, thence 1,905 feet 228°15′ to the most northerly entry, which is 500 feet wide. It then extends 6,115 feet along the same line to the central entry, which is also 500 feet wide. It then extends 5,286 feet 210° to a point where it joins with a concrete breakwater. The concrete breakwater then extends 2,727 feet 164°30′ to the most southerly entry to the breakwater, which is approximately 500 feet wide. From the south side of the entry it continues on the same course for another 2,550 feet. At this point, the rubble mound breakwater commences again, extending on the same bearing for another 2,450 feet to the entrance channel of the Kaministikwia River.

Mariners should note that a 27 foot basin extends from

the Keefer Terminal to the northerly limit of the central channel through the breakwater. There is no channel or basin between the northerly limit of the central entry and the basin dredged inside of the northerly entry.

Bridge Signals.—The whistle signals locally used by vessels are as follows:

McKellar River: Canadian Pacific Rail bridge; 2 long, 1 short blasts.

Kaministikwia River: Canadian Pacific Rail bridge (about 2,300 feet upstream from the preceding); 2 long, 2 short blasts.

Canadian National Railway bridge (Westfort); 2 long, 2 short blasts.

Water Main and Cable Crossings.—In Kaministikwia River: On south side of C.P.R. bridge, submarine power and telephone cables. Between Westland Elevator and C.P.R. freight shed No. 7, overhead high-tension transmission line, 25,000 volts, minimum height above water 115 feet. At Westfort bridge, submarine power and telephone cables and water and natural gas mains. Between Westfort bridge and Plymouth Cordage Co. Dock, high-tension transmission line, 115,000 volts, minimum height above water 132 feet.

In Mission River: About 600 feet east of upstream end of Valley Camp Coal Dock, two 16-inch water mains.

In McKellar River: East side of C.P.R. bridge, submarine power cable.

In Outer Harbour: Easterly edge of shoreline on north side of the entrance channel to south end of breakwater on a line bearing approximately 071°, submarine cable.

Lakehead Harbour Main Light at north side central entry of breakwater to Manitoba Pool No. 2 Elevator, on a line bearing approximately 316°, submarine cables.

Lakehead Harbour Main Light to Lakehead Harbour Central breakwater entry South Light on a line bearing approximately 226°, submarine cable.

Lakehead Harbour Main light to Lakehead Harbour northerly breakwater entry light on line bearing 048° approximately 250 feet west of the breakwater, submarine cable.

An intake pipeline at Bare Point extends 101° approximately 2,200 feet into the lake.

Two waterworks intake pipes, laid by the city of Thunder Bay, extend from a point on the shore 1.49 miles 025°19′ from Bare Point, at the waterworks pumphouse, into the Lake 2,350 feet 127°33′. Mariners are warned not to anchor their vessels in the vicinity of these pipes.

Aids to Navigation—Southern Section.—The sides of the Kaministikwia River entrance are buoyed. The north side of the entrance channel is also marked by the Kaministikwia River entrance light on the south end of the breakwater, and a fog horn is maintained at the light. A light, located on the north side, marks the Kaministikwia River mouth at the westerly end of the entrance channel. The dredged entrance to Mission River is marked at the lakeward end by a buoy on its north edge, and a light marks the end of the Mission breakwater on the south side; a fog horn is operated at the light. A light, 14 feet high, on a steel tower, is located at the inner end of the breakwater.

Aids to Navigation—Northern Section.—Northerly breakwater entrance light is shown on a mast at the end of the breakwater on the north side of the northerly breakwater entry. A light is shown from a pipe mast on a building near the north end of the breakwater on the south side of this entrance. An electric foghorn is located at the south light.

The central entry channel is marked on its north side by an outer light on the end of the rubble mound breakwater, known as the Main Light, and a light on the south side. A fog horn at the Main Light and a radiobeacon are operated at this station. The sides of the channel inside of the main entry are marked by buoys on the north edge and the south edge.

At the southerly entry through the breakwater, a light is located on the end of the breakwater on the north side.

Dry Dock.—The dock of the Port Arthur Shipbuilding Co., near Bare Point, to the northeast of the elevators in the northerly section of the harbor, has the following dimensions: Length overall, 747 feet; length on keel blocks, 679 feet; width at top, 98 feet; top width at entrance, 77 feet; bottom width of entrance, 72 feet; depth on sill (low water datum), 16 feet. A fitting-out slip, minimum depth 19 feet, extends along the easterly face, which is equipped with tracks, shear legs, etc. There is a depth of 18.7 feet between lines extended southerly in the prolongation of the westerly limit of the dry dock and the easterly limit of the fitting-out slip.

Marine Services.—Practically all types of service are available.

Thunder Bay, described in part above, is a fine sheet of water extending 34½ miles in a northeast and southwest direction, with width of 15 miles northwest and southeast, narrowing at both ends. On its shores, cliffs rise from 1,000 to 1,350 feet out of the lake.

The northwest coast of the bay, extending from Bare Point about 20 miles northeasterly to its head, may generally be approached within 1 mile. **Papoose Islands**, lying 1 mile east of Wild Goose Point and about 6 miles from Bare Point, have no outlying dangers off them beyond 600 feet. About 3 miles northeast of Wild Goose Point, and ¾ mile offshore, **Mary Island** runs about ⅞ mile northeast and southwest, inclosing **Mary Harbour**, which affords anchorage in 3 to 7 fathoms, bottom clay. Silver Harbor is a small bay, with no wharf or range lights, just north of Mary Island and 9 miles from Bare Point. About 1½ miles farther northeast is **Mackenzie Bay**, generally shallow and rocky, with **Lefebvre** and **Bacon Islands** in its mouth. Northeast of Mackenzie Bay and separated therefrom by **Conmee Point** is **Amethyst Bay**, having deep water within ⅜ mile of the shore, but obstructed by several small islands, including **Buck** and **Kent Islands**, with shoals near them. **Amethyst Harbour** is the northeast extremity of the bay, inclosed by **Perry Point** with **Lambert Island** reaching ¾ mile southwesterly therefrom. The Government wharf has an over-all length of 353 feet, with a depth of 8 feet at the outer end. **Keshkabuon Island**, 2⅛ miles long east and west by ½ mile in greatest width, lies easterly off Amethyst Bay, with its west end 1 mile south of Perry Point.

A buoy marks a reported uncharted rock on the north side of the island. Temple Rock, awash, is a detached spot ½ mile westerly from the west end of Keshkabuon Island and is marked by a buoy located south of the rock. In the bight between Perry and Knobel Points are Chipman Rock, with 6 feet of water, and Sour Island with shallow water surrounding it.

The whole easterly shore of Thunder Bay, trending about 20 miles southwesterly from the head to Thunder Cape, is very clean and bold, and may be approached to within ¼ mile. **Clavet Bay**, under **Clavet Point**, about midway of the east shore, and farther south **Hoorigan Bay**, under **Hoorigan Point**, are of similar shape, both opening to the southwest. **Sawyer Bay** is situated 5¾ miles north of Thunder Cape and contains good shelter and holding ground in all winds except those between west and north.

Section IX.—Northerly Shore From Thunder Cape to Michipicoten Harbor, Including Black Bay and Nipigon Bay, Ontario

Charts of Canadian waters are prepared by the Canadian Hydrographic Service, Department of the Environment, Ottawa, Canada

From Thunder Cape Light 10 miles easterly to Black Bay entrance strangers should keep outside the group of islands of which **Trowbridge Island** is the most southerly and westerly and **Shangoina Island** the largest. On the summit of Trowbridge Island, about 3 miles easterly from Thunder Cape, is a light, and a fog horn sounds when required. Silver Islet (marked by buildings), northeast of Shangoina Island, has rocky spits extending northerly and northeasterly from it. Seven-eighths mile easterly from Silver Islet is **Maloney Shoal**, a detached 13-foot spot, and ½ mile northeast of this spot a very shallow shoal continues northeast over 1 mile, to abreast of **Middlebrun Bay**; on this shoal is **Sand Island**.

Silver Islet Harbour, Ontario.—There is a public wharf, built in 1951 on the site of an old wharf, which provides a landing face of 132 feet about 6 miles northeast of Thunder Cape Light, inside of Burnt Island and abreast of Silver Islet. The front mast of a range of daymarks is on the wharf near its southwestern end, and the rear mast stands 132 feet 053° from the front one. This range leads to the wharf from the southwestward between the shoals off Burnt Island and Catholic Church Point. No mail, telephone, or telegraph facilities are available.

There is a depth of 13 feet at the wharf and good shelter from all winds. Vessels may also approach the wharf from the eastward by keeping Silver Islet Rock (18 feet high) close aboard and leaving the small rocks about half a mile northeast of the wharf on the left hand, distant 600 feet, and then steering for the wharf.

A group consisting of **Clark, Gravel and Cranberry Islands**, nearly connected by reefs and isolated rocks, forms the line of demarcation between the Middlebrun and Montreal Channels constituting the main entrance into Black Bay. **Middlebrun Channel** leads between Sand and Clark Islands. **Montreal Channel**, between Clark and **Porphyry Islands**, is wider, more direct, and deeper, with Porphyry Point Light as a guide, and is to be preferred. To the northeast, entrance into Black Bay may also be had by the Magnet Channel between Magnet and **Edward Islands**, but this channel should not be attempted by strangers.

Porphyry Point Light and a fog horn are located on the extreme southwest end of Porphyry Island, 14 miles 079° from Thunder Cape Light. From the eastward, the light is visible south of the bearing toward it 233°. Vessels coming through Shaganash Channel may change course off Tunnell Island as soon as the light is seen.

Black Bay extends 38 miles in a northeasterly direction, being about 3 miles across near Edward Island, but widening to 10 miles near its head. Depths ranging from 30 to 180 feet are found through the bay for 25 miles from the entrance, north of which the depths range downward from 30 feet, with a number of outlying shoals and islands. There is a public wharf built in 1954 in the northerly part of Black Bay, located at the mouth of Hurkett Cove, which provides landing facilities in depths up to 8 feet. The wharf is timber pile trestle construction 92 feet long by 16 feet wide, connected to shore by a stone and gravel approach 197 feet long by 16 feet wide. Details of this bay and other Canadian waters along the northern coast of the lake may be derived from the charts and sailing directions issued by the Canadian Hydrographic Service, Department of the Environment, Ottawa, Ontario.

In this stretch of 29½ miles to the northeast from Porphyry Point Light to **Lamb Island Light, Ontario**, a continuous chain of islands and rocky shoals renders inshore navigation dangerous. Attention is also called to the extraordinary local disturbances of the compass needle in this vicinity. Shaganash Light is located on the western end of island No. 10, a small island lying to the westward of the northerly end of **Shaganash Island**, about 10 miles northeast of Porphyry Island.

Shesheeb Bay is a landlocked harbor opening about 6½ miles southwesterly from Lamb Island Light. The bay is not recommended as an anchorage as the water is deep; is open to the southeastward; and there are shoals in the entrance including a 10½-foot spot about ¼ mile off the westerly shore entering Shesheeb Bay.

Otter Cove is a landlocked harbor opening about 6½ miles southwesterly from Lamb Island Light and affords good anchorage and protection from all winds.. The approach to this harbor is free from dangers, except **Manuel Rock**, with 10 feet of water over it, lying about ⅜ mile west of the south end of **McKay (Otter) Island**. Otter Cove may be entered from either side of McKay (Otter) Island.

Lamb Island is on the west side of the entrance to Nipigon Strait; on its southeast side is a light and an air fog diaphone sounds as required. **Sovereign Rock**, with 12 feet of water, lies about ¾ mile 216°30′ from the light, with a 7½-foot patch inside of it. **Newcombe Rock**, with about 4 feet least depth, is about 2,200 feet north of the light. Two spots, with 15 feet and 6 feet depths, form detached obstructions in the passage between Lamb and Spar Islands. Vessels from the southwestward should

keep 1 mile to southward of Lamb Island Light and round into Nipigon Strait on a northerly course passing about ½ mile to eastward of the light.

The greatest length of **Nipigon Bay** from Wilson Island to the mouth of the Nipigon River is about 40 miles, and it is about 15 miles in maximum width from the head of Nipigon Strait to Mazokamah Bay. On the south the bay is inclosed from Lake Superior by **St. Ignace, Simpson, Salter,** and **Wilson Islands.** A light, mounted 32 feet above the water on a steel tower, marks the northeast point of Simpson Island. There are five ship channels leading into this bay, named from west to east as follows: Nipigon Strait, Moffat Strait, Simpson Channel, Wilson Channel, and Schreiber or North Channel. The so-called **Blind Channel** between **Fluor Island** and St. Ignace Island is closed by a bar with only 4 or 5 feet available depth over it.

The entrance into **Nipigon Strait** is between Lamb and Fluor Islands and is marked by a range of lights. By keeping in the middle between Fluor and **Moss Islands** and continuing the course in midchannel between a group of small islands lying 1 mile beyond Moss Island, all dangers are avoided. After passing Fluor Island, favor the west shore of Nipigon Strait for a distance of 2 miles, whence a midchannel course will lead safely into Nipigon Bay. The channel is marked by buoys. Good anchorage with mud bottom is found all through this strait in 6 fathoms and upwards.

Red Rock, Ontario, is the site of the St. Lawrence Corporation Ltd.'s plant, situated on the west shore of Nipigon Bay about 6 miles south of the village of Nipigon and 1½ miles north of Five Mile Point. A large timber wharf extends offshore to an L section. During 1937, the fairway to and alongside the wharf and including a berth slip inside of the L section was dredged to a depth of 21.7 feet. A range of lights marks the approach to the wharf. There is a public wharf at Nipigon, Ontario, which can be approached by vessels drawing no more than 6 feet (1958).

Moffat Strait, having its lake entrance about 20 miles northeast of Lamb Island Light, passes between St. Ignace and Simpson Islands. This channel can only be used for vessels drawing less than 15 feet, being very shallow and narrow at its northerly inlet into Nipigon Bay. The southerly entrance is made by giving **Grotto Point** a wide berth and keeping Bead Island close aboard. After passing **Bead Island,** excellent holding ground in 6 to 16 fathoms, sand and mud bottom, with protection from all winds, is found anywhere in this landlocked strait.

Simpson Channel, 8 miles to the eastward of **Moffat** Strait and between Simpson and Salter Islands, is the safest and most used channel for vessels entering Nipigon Bay from the south or southeast. Keeping a midchannel course, vessels can enter the bay without encountering any dangers. Battle Island Light is located on the westerly point of **Battle Island** at the east side of the entrance, 28½ miles 069°15′ from Lamb Island Light; a fog horn and a radiobeacon are operated at this light.

Wilson Channel leads into Nipigon Bay between Salter and **Wilson Islands.** An unobstructed midchannel passage leads safely into the bay, but owing to its proximity to Simpson Channel is rarely used.

Schreiber or North Channel, about 11 miles east of Simpson Channel, is formed by Copper and Wilson Islands on one side and the main shore on the other; being difficult of access, it is not recommended. A dangerous reef nearly awash, called **Bread Rock,** marked by a buoy, lies in the middle of the entrance from the lake, 1½ miles 126°15′ from the east extremity of Copper Island. A rock, McGarvey Shoal, nearly awash lies about ⅞ mile northeasterly of the northwest point of **Copper Island.** North of Wilson Island, **Channel, Healey,** and **Quarry Islands** divide the channel into crooked and intricate passages. A buoy marks the shoal spit extending north from Channel Island.

There are a number of detached rocky spots in Nipigon Bay, the most dangerous one, **Barwis Rock,** rising from deep water to within a few feet of the surface, lying 2⅜ miles northwesterly from the northwesterly point of Salter Island. A buoy marks this spot. Rolette Shoal, a small detached rocky spot lies about ½ mile northwesterly off the same point. In the westerly part of the bay, opposite Nipigon Strait, a group comprising Vert, La Grange, **Burnt,** Frog, and Outan Islands are connected with the shore of St. Ignace Islands to the south by a shallow area with depths ranging from 12 to 22 feet. A light 24 feet above water on a steel tower is located on the northeast corner of **Vert Island.** Brule Shoal, rocky, with scant water lies about 1½ miles in an easterly direction off the southern extremity of Vert Island. **La Grange** and **Outan Islands** are connected with each other by very shoal water. **Frog Island,** lying 2 miles southwesterly off the south point of Outan Island, is surrounded with rocks and boulders, and there is only from 10 to 16 feet of water for 1½ miles to the west of it and in the area between it and Outan, La Grange, and Burnt Islands. Shoal water along the northerly side of the passage between **La Grange** Island and Holden Shoal is marked by a buoy. The southeast end of Crichton Island is marked by a light shown from a steel tower.

The north coast of Simpson Island, and that of St. Ignace Island west to Burnt Point, have steep sandstone cliffs rising from the water with no offlying obstructions. A shoal spot, with a least depth of 9 feet, is about 1.5 miles 276° from Burnt Point. Two rocks, covered 21 and 17 feet, are 0.2 mile north and 0.9 mile north-northeast, respectively, of this shoal. The north sides of Vert and La Grange Islands are also deep-to, but a 14-foot shoal exists about 1 mile west of La Grange Island and 1⅛ miles northeasterly of Burnt Island. The west shore of Nipigon Bay opposite Frog and Burnt Islands and the north shore opposite La Grange and Vert Islands are shallow and should be given a berth of 1½ miles.

The north of mainland coast of Nipigon Bay has a number of indentations, including **Mazokamah, Mountain,** Gravel, and Pays Plat Bays. From **Cooper Point,** a sharp point of land south of the mouth of **Jackfish River,** rocks and boulders extend ½ mile to the south and east, and care should be taken to clear these obstructions in

entering Mazokamah Bay, which has good water inside. Shoal water with boulders and rocks extends ¾ mile off **Mac Innes Point**, which is the westerly point of **Mountain Bay** and is marked by a light, atop a steel skeleton tower, 26 feet above the water. The shoal water continues along the shore past **Grant Point** to the mouth of **Gravel River**. The coast eastward in and beyond **Gravel Bay** may be approached within ⅓ mile, except for **Oldman Shoal**, a 19-foot spot ⅝ mile offshore on the east of Gravel Bay. The **Powder Islands** in **Pays Plat Bay** should be approached with caution. A buoy marks **Barwis Rock**, one mile from the south point of Powder Islands. To make **Rossport**, on the main shore in Nipigon Bay, a midchannel course northwesterly through Wilson Channel with Rossport Point Light ahead, will lead to the vicinity of the harbor entrance. Turning to the northeast, a light 32 feet above the water atop a steel mast on the northwesterly tip of a small island, marks the southeasterly side of the harbor entrance. Rossport is a small fishing village with a good natural harbor; a Government wharf was built in 1908, on which is shown a light 16 feet above the water. Limited supplies and telegraph facilities are available.

Returning to the lake coast along the south side of the islands inclosing Nipigon Bay, from **Lamb Island** Light to Battle Island Light caution should be exercised in approaching the outlying group of islands and shoals extending from Fluor Island on a line toward the southeast end of St. Ignace Island, although a fairly straight, sheltered passage, of good depth and width, is available through this group to those locally acquainted. **Duncan Cove**, in the south shore of St. Ignace Island, affords good anchorage in 5 to 6 fathoms of water and protection from all but southeasterly winds. The approach from the lake is through unobstructed deep water on a northwesterly course passing between ½ and 1½ miles to eastward of the outlying islands. The south coast of St. Ignace Island, thence eastward, is more or less obstructed for 2 miles off by islands and shoals. In this stretch **Armour Harbor**, inclosed by **Armour Island**, affords good anchorage in 5 fathoms, mud bottom, and almost complete protection.

The south shore of Simpson Island should not generally be approached within 1 mile, and in making **Woodbine** and **Morn Harbors** exercise great caution in entering. From Battle Island Light eastward the same rocky character continues along the shores of Wilson and Copper Islands. Avoid Bread Rock, located nearly in mid-entrance of Schreiber Channel into Nipigon Bay, as mentioned above.

The main coast from Nipigon Bay 42 miles eastward to Peninsula Harbor has many indentations, and the shores are rocky, with many outlying rocks and reefs. **Les Petits Ecrits** are a group of small rocky islands and reefs lying 2 miles southwest of the entrance to **Terrace Bay**, which opens about 6 miles east of Schreiber Channel. This bay has good water inside, but along the east shore near the middle, and also off the entrance points, are found a number of small rocky islets, which should be avoided.

Jackfish Bay, 9 miles east of Terrace Bay, forms a good harbor of refuge, with good anchorage in 6 to 8 fathoms in the northeast arm. Entering Jackfish Bay, keep in the center between **St. Patrick Island** on the east side (upon which, near its west point, is a light) and **Victoria Cape**, both of which are prominent and easily distinguished at a distance of 3 miles. The two old wharves and the two mooring cribs at Jackfish Village in Jackfish Bay were removed in 1967. Demolition was carried out to lake bottom or to eight feet below water level, whichever was the lesser. Northwestward is Moberly Bay, dangerous to enter unless locally acquainted. The anchorage is found by rounding the next point northward of the island at the entrance and heading northeasterly until **Moberly Bay** closes, then come to in 6 to 8 fathoms of water in a landlocked harbor.

Slate Islands, a group of eight, the southerly and largest being 4 miles wide north and south and 5 miles long east and west, lie 5¾ miles south of Victoria Cape. There are many outlying rocks surrounding the northerly islands of the group, which should be carefully approached. On the south extremity of the south Slate Island is a light, and a fog horn, and a radiobeacon are operated at this station. The lighthouse stands on the summit of a hill forming the south side of **Sunday Harbor**, at the south extremity of the island group. The harbor is sufficiently large to admit any steamer but is not recommended as the water is deep, and the holding ground poor, and with a southerly or southwest wind, a heavy sea rolls in, making the anchorage untenable and difficult or impossible to clear. Strangers can enter by keeping the coast of the island close aboard from a point about a mile west of the lighthouse.

Shoal Bank in Mid-Lake.—In August 1929, deep-sea sounding operations conducted by the United States Lake Survey disclosed a previously uncharted bank, now named **Superior Shoal**, located in mid-lake at about latitude 48°04′, longitude 87°11′, in Canadian waters. In 1930 the Canadian Hydrographic Service made a close examination of the region and located a dangerous rock at a position 39 miles 187°27′ from Slate Islands Light, on the vessel course between Passage Island and Michipicoten Island. The summit of the rock is about 100 feet in diameter and is visible from above. Sweeping operations by the United States Lake Survey in 1941 showed a least depth of 21 feet on the shoal, with deep water surrounding.

Returning to the Mainland, a detached islet with surrounding rocks and reefs lies 1 mile offshore 4 miles southeast of Jackfish Bay Light, and about 1½ miles farther is **Bottle Point**, which forms the southeast side of **L'Anse a la Bouteille**, with islets and reefs in its entrance. From the point about 5½ miles northeast of Bottle Point and to the east of the mouth of **Prairie River**, rocks and reefs extend 1 mile offshore, and the shore continues broken northeasterly 3 miles to **McKellar Harbor**. The latter affords anchorage in 9 fathoms behind the islands in its mouth, but the entrances are narrow and fringed with reefs. **Barclay Islands** lies in deep water 1½ miles south of McKellar Harbor.

Pic Island lies about a mile southerly from the bold headland 10½ miles east of Bottle Point. The island is very prominent, about 3 miles long east and west by 2 miles in width, and has quite an irregular shore line. The channel immediately between the island and the mainland is generally deep, but **Nicoll Shoal**, with 12 feet depth, lies about in the middle of the west entrance, ⅜ mile northwesterly from the north point of Pic Island. There are numerous detached rocky reefs from 1½ to 3½ miles to the eastward of the island and reaching 3 miles southerly from the adjacent mainland.

Peninsula Harbor is at the east end of the extreme northerly shore of Lake Superior. **Manitoba Shoal**, with depth of less than 6 feet, lies in the north entrance to Peninsula Harbor, midway between the main shore and Hawkins Island at the entrance. The shoal is marked by a middle ground buoy in 7 fathoms of water approximately 100 feet southwest of the shoal area. To avoid all danger from this shoal the southeast entrance to the harbor should be taken. Peninsula Harbor Light, visible through an arc of 164° from 324° through north and east to 160°, is located on the southwest end of the Peninsula. **Hawkins Island Light** is located on the south end of the island at the entrance to the harbor. A light is also located on the southwest end of Skin Island, on the east side of the harbor.

Marathon, Ontario.—A community on the easterly side of Peninsula Harbor. There is a post office, a Canadian Pacific Rail Station, telephone and telegraph facilities. The main highway travels west to Port Arthur and south to Sault Ste. Marie. The Marathon Paper Company plant is located to the west of the community on the southeasterly side of Jellicoe Cove and includes a private 460-foot dock with 19½ feet of water alongside. The easterly side of Jellicoe Cove is designated a booming area for lumber and contains many piles and cribs.

Intake Pipe.—A water intake pipeline extends about 1,100 feet northerly from the shoreline opposite the southeast end of the papermill plant and is marked at the midpoint and outer end by buoys.

From Peninsula Harbor the coast trends southerly 44 miles to Otter Island, thence southeasterly about 20 miles and easterly about 40 miles to Michipicoten Harbor. All this shore is bold and rocky and indented with numerous coves and harbors affording shelter for small craft in northerly and easterly gales. There are many outlying rocks and reefs extending from ¼ to 1½ miles offshore, and the coast should be approached with extreme caution.

Heron Bay, located about 6 miles southeast of Peninsula Harbor, is about 2 miles long, with width of about 1 mile at the mouth and narrowing to its head. Anchorage may be had in 40 feet of water over sand, but there is no protection from westerly winds. There is a Canadian Pacific Rail station, also a general store and post office. A wharf about 300 feet long, with 21 feet of water alongside, is located on the north side near the inner end of the bay. Buoys mark reefs in the bay and the west side of the approach to the wharf.

Otter Island Light is on the northwest extremity of Otter Island, off **Otter Head**; a fog horn, about 400 feet west of the lighthouse, is sounded at the discretion of the resident lightkeeper. There is good shelter behind Otter Island, and also in **Otter Cove** behind Otter Head. Buoys mark two shoal projections from the mainland northeast of Otter Island and a buoy marks a shoal spot southeast of the southeast end of the island. The entrances to **Big Daves Harbor** are not deep enough for large steamers. A group of rocky islets with outlying reefs and boulders, extending ¾ mile in a northwesterly direction from Otter Island Light, should be given a wide berth in making Big Daves Harbor from the southward and westward. Shoal water extending ½ to ¾ mile off around Otter Head should be avoided in making the entrance to Otter Cove. The coast from Otter Head to Michipicoten Harbor should not be approached nearer than ¾ mile.

Michipicoten Island, Ontario.—Is located about 9½ miles southerly from the shore near the bend southeasterly from Otter Island. It is about 17 miles long east and west and about 6½ miles wide north and south. The south shore should be approached with caution, as there are many detached reefs and islets which, from Quebec Harbor westward, extend to 1¼ miles offshore. Off the northwesterly side there are many islets and reefs within 1 mile from shore. A light, at an elevation of 30 feet, is shown from a wooden tower on a small island southwest of Cotton Cove on Michipicoten Island.

Michipicoten Island East End Light is on the northeast extremity of the island, a fog alarm and a radiobeacon are operated at this station.

Quebec Harbor is situated near the middle of the south coast of the island. Protection from all winds and good anchorage in 5 to 8 fathoms will be found in this snug harbor. In 1916 the Canadian Government completed a dredged cut with least width of 200 feet and least depth of 20 feet, through the entrance and into the deep water of the harbor.

Davieaux Island Light is on the summit of the long narrow island to the west of the course into the dredged cut, 100 feet from the north shore and 2,400 feet from the east extreme of the island. A foghorn is sounded at the discretion of the resident lightkeeper.

Quebec Harbor Range Lights on the north shore of the harbor, and bearing 000°45′, lead through deep water between Hope and Davieaux Islands and also mark the axis of the dredged channel.

Cozens Harbor, near the southeasterly end of the island, is a fine harbor for small craft, affording good anchorage and protection from all but southerly winds.

Caribou Island, situated 22 miles south of Michipicoten Island, is about 4 miles long north and south, with maximum width of 1½ miles, narrowing to a point at either extremity. The east shore should not be approached nearer than ⅜ mile. Reefs extend ½ mile northerly and westerly from the north and west shores, respectively, and a rocky bank with depths of less than 17 feet extends from the southwesterly side to a point 1 mile southwesterly of Caribou Island Light. This light is on a small

island 1 mile west of the southern extremity of Caribou Island; a fog horn and a radiobeacon are operated here.

Section X.—East Shore From Michipicoten Harbor to Gros Cap, Ontario

Charts of Canadian waters are prepared by the Canadian Hydrographic Service, Department of the Environment, Ottawa, Canada

Michipicoten Harbor, Ontario is the harbor formed by the northerly cove of Michipicoten Bay and is a lake terminal of the Algoma Central Railway. It has a post office, customs office, and telegraph station and is an important coal receiving port.

Aids to Navigation.—Michipicoten Harbor Light, shown 88 feet above the water from a skeleton tower, is on the southeast extremity of Point Perkwakwia; a fog diaphone, and a radiobeacon are operated at the station. A range of lights, maintained by the railway company on the shore north of the wharves and shown when a vessel is expected, leads to the harbor.

Harbor.—The coal wharf of the Algoma Central Railway Co., 1,260 feet long, and the commercial pier are situated in the northwestern part of the harbor. In approaching, bring the commercial pier on end, or the range lights in line if lighted until about 500 feet lakeward of the outer end of the coal wharf, when a vessel may haul over for the latter. The berth along the coal wharf has been dredged to a depth of 22 feet over an area of 1,400 feet long and having an average width of 210 feet with the exception of an area midway along the face of the wharf which is dredged to 20 feet.

In the cove in the westerly shore between the coal wharf and the harbor light on **Point Perkwakwia**, shallow draft vessels will find good shelter and holding ground.

Michipicoten River, entering the east side of the bay, is navigable for launches of about 3 feet draft for approximately ⅔ of a mile to the village of Michipicoten Mission. Great care should be taken when entering this river due to the presence of a shifting sand spit on the south side of the mouth, and a rock marked by a concrete pillar, in the entrance channel itself. The safe passage is not marked.

The shore from Michipicoten Harbor southerly to **Brule Point**, a length of 12 miles, is steep-to. **Brule Harbor** is situated about 1 mile south of the point and affords excellent shelter with rather deep water. The southeast arm, about 13 fathoms deep, is nearly circular and has a very narrow entrance. The northern arm is larger and quite as deep. **Cape Gargantua** is about 16 miles southerly from Brule Point, the intervening shore being of irregular trend, generally bold, and deep-to except in the vicinity of Cape Gargantua. **Indian Harbor** is small and lies in the southeast corner of the bay on the northerly side and 1¾ miles east of the extremity of the cape; it contains excellent anchorage and shelter. In entering, keep the south and west shores best aboard, to avoid some shoals in the entrance, and anchor off the old fishing shanties in the southwest corner of the harbor.

Commencing at Cape Gargantua and extending about 3 miles southeast is a string of small islands and rocks, the largest and highest of which is called **Devils Warehouse Island**. A light is on the northwest corner of **Hursley Island**, the westernmost island off the cape. Southeasterly 4,200 feet from Hursley and 1,500 feet off the island abreast of it, is **Pannikin Shoal**, a small rock with only 14 feet of water over it. With this exception there are no shoals outside the line of the islands and rocks. For those locally acquainted there are good passages through the islands, with good anchorage and shelter in **Warp Bay**, about 1 mile north of Devils Warehouse Island.

Gargantua Harbor is a small harbor of refuge about 4 miles southeast of the cape. The entrance has a small island in it, upon which is a light. There is a wharf in front of the lightkeeper's dwelling on the southwest side of the harbor, about ¼ mile inside the extremity of the point. The depth at the face of the wharf is 14 feet.

The harbor is in the northwest corner of the bay and is barely wide enough for fair-sized vessels to ride at anchor. Larger craft tie up to the small wharf at the keeper's dwelling. The harbor may be entered by the passage either north or south of the island; the south entrance is wholly free from danger and is recommended. In the north entrance there are two rocks with 5 and 6 feet least water over them, one lying 600 feet northwest from the light and about 175 feet from the west side of the island, and the other ⅜ mile northwesterly from the light and about 500 feet off the southwest side of the point forming the southwest side of the harbor. A midchannel course through the north entrance clears both rocks.

The whole shore from Gargantua Harbor to Coppermine Point, trending about 25 miles southeasterly and thence about 23 miles southwesterly, may be approached to ¼ mile and often closer, but there are numerous outlying islands and shoals which must be avoided.

From **Ella Islet**, shoal water extends northerly 3,000 feet to a depth of 16 feet, westerly 2,300 feet to a depth of 15 feet, southeasterly 1,300 feet to a depth of 5 feet, and easterly 2,200 feet to a depth of 11 feet. Deep water approaches close to the bank, which is very shallow inside the extremes above given. The passage between Ella Islet and Leach Island banks is ¾ mile wide, with 12 fathoms or more depth in the middle.

Leach Island lies 6½ miles southerly from Gargantua Harbor and 3 miles offshore; its shores are good outside a distance of 1,000 feet, except at the south point, where a dangerous reef extends southwesterly 2,300 feet to a spot where a depth of only 5 feet exists, and also southeasterly 1,800 feet to a depth of 3 feet. Both these spots are deep-to on their outer sides. As long as Ella Islet is in sight west of Leach Island, when bearing northeasterly, a vessel will be west of the reef. **Sparrow Shoal**, a small ridge of boulders, lies northwesterly 8,200 feet from the most westerly point of Leach Island. The eastern and shoalest spot has upon it only 12 feet of water, and from it the ridge extends westerly 600 feet to a depth of 15 feet. About midway between this shoal and Leach Island, depths of 24 feet will be found. However, a depth of 5½ fathoms may be carried through

between this spot and Sparrow Shoal. The northeast point of Montreal Island in line with the south point of Leach Island, bearing southeasterly leads 350 feet southwest of the shoal; and Bald Head, the conspicuous white bluff on the main shore north of Lizard Islands, in line with the north point of Leach Island, bearing easterly leads 2,100 feet north.

Lizard Islands, seven in number, form a low group 2¾ miles long northeasterly and southwesterly by ¾ mile wide, lying 5 miles southeasterly of Leach Island. Shoal water surrounds the group on the west side for 1 mile, on the south for ½ mile, on the east for 600 feet, and on the north for 1,500 feet. The passage between Rowe Island, the northernmost of the group and the main shore is 1 mile wide and 20 fathoms deep. A light 28 feet above water, on a steel mast, with a white day mark is located on the northeasterly tip of Rowe Island. **Ganley Rock**, with 18 feet least water over it, lies southeasterly 3 miles from the south point of the large island next to the south one of the Lizards and 2 miles offshore. From the same point, a shoal with 21 feet least depth bears southeasterly distant 2⅝ miles, being about ½ mile southwesterly from Ganley Rock. To clear the very shallow reefs on the west side of the Lizards, vessels should keep to westward of a line bearing northeasterly on Bald Head, and to pass eastward of Ganley Rock and the northeast end of the Lizards, should keep to eastward of a line bearing northwesterly on the same headland.

Sinclair Cove has been developed by the Canadian Government as a refuge and fishing harbour. There is an L-shaped wharf 195 feet long giving berthing on both sides in depths of 6 to 8 feet. The cove provides shelter from all winds, and is connected by road to Highway 17. Entry can be made easily south of Sinclair Island over 20 feet depth, or with care north of Sinclair Island where least depths of 6 feet will be found. Sinclair Island Light on the southwest side of Sinclair Island, is mounted 57 feet above the water on a skeleton tower.

Griffon Reef lies north of the northwest corner of Montreal Island, its southerly edge, with 18 feet depth, being 1⅜ miles distant, and its northerly end, with rocks awash, about 2 miles distant. Between the island and shoal there is a channel over a mile in width having 15 fathoms or more depth.

Montreal Island is of square formation, about 1¾ miles each way, and is situated about 6½ miles southeasterly from the Lizards. Shoal water of a uniform character surrounds it for a space of only ¼ to ½ mile, the depth increasing rapidly beyond this limit.

Chart 14962.—Montreal Shoal is a dangerous detached obstruction, with 6 feet least depth near its northerly end, which is 3½ miles southerly from the southwest corner of Montreal Island. Thence the shoal extends south 1¼ miles, to a point 3¼ miles northwesterly from the northwest corner of **Theano Point**. There is a least depth of 9 feet near the south end of the shoal. The shoal with less than 20 feet depth is about ⅝ mile wide. A line tangent to **Point aux Mines** and the west side of Montreal Island clears the shoal by a good margin on its west side; and a line tangent to Theano Point and the east extremity of Montreal Island passes well clear of the shoal on its east side.

Montreal River, a tourist resort and shipping point for commercial fishermen, is situated at the mouth of Montreal River. It is on Highway No. 17 and has telephone and mail connections with Sault Ste. Marie. It is a safe anchorage for boats of 5 feet draft. It has four small wharves, each 30 feet long, with mooring on both sides. A pile trestle wharf, having a total length of 280 feet and a width of 10 feet, runs along the south shore of the basin. A light on the high bluff inshore, marks the entrance. The channel, between the north side of the south shore and the remnants of an old wharf, has been closed off. Access to the wharves and boat basin is now by a channel from the river, located about 200 yards upstream from the mouth. The gravel bar at the river mouth continues to shift and from time to time closes the channel, but usually allows passage with care and local knowledge. Craft intending to use this harbour should make prior investigations as to its condition.

Agawa Islands are a group of small islands and rocks lying in the west entrance to **Agawa Bay**. Very little shallow water lies about them, the worst danger being a rock with 6 feet of water over it, lying southeasterly 1,500 feet from the most easterly island. Good anchorage and fair shelter will be found off the northeast side of the largest and highest island, in the middle of the group, entrance being from either end of the channel. **Agawa Bay** is a large open indentation about 4 miles northeast of Montreal Island. It has clean sandy shores, and good anchorage may be had with shelter from offshore winds.

Anchorage may also be had in **Alona Bay** in the south side of Theano Point, 13 miles to the southward. The passage between **Ossifrage Island** in its entrance and the southwest part of the point is not good. The water in **Mica Bay**, separated from Alona Bay by **Point aux Mines**, is too deep for anchorage. **Siesta Shoal** is an outlying spot with 24 feet depth, located 5½ miles west of Point aux Mines.

Mica Shoal, composed of boulders overlying solid rock, with 14 feet least depth over some of them, is the most dangerous reef on the east coast, lying 5½ miles southwesterly from Point aux Mines and 4¼ miles northwesterly from Mamainse Point, on a line joining Coppermine Point and Cape Gargantua. The shoal is marked by a buoy moored in the middle of the same. To clear the shoal by ⅞ mile on its west side, keep Coppermine Point Lighthouse open, west of Rousseau Island about 2,880 feet north of the point, bearing southeasterly. To clear it ¾ mile on its east side, which is the better clearing mark, keep Coppermine Point Lighthouse over the top of **Hibbard Rock**, bearing southerly. From this shoal Hibbard Rock bears southeasterly, distant 4¾ miles.

Mamainse Point forms the southwest entrance to the slight indentation called Mica Bay, and bears southeasterly 40 miles from Cape Gargantua. The point is badly broken up into several islands and dry reefs. A light

is maintained on the north point of the largest island off Mamainse Point, and a radar responder beacon (Racon) Morse Code G (— — ·) is located at this light.

Mamainse, a shipping point for commercial fishermen, is situated at Mamainse Point. An entrance channel and mooring basin were dredged to a depth of 6 feet in 1956 to provide access to the private and Government wharves located here. Entrance is made from the north by a 50 foot channel along the east side of the largest island known as Mamainse Island, progressing around the south end of the small island centrally located between Mamainse Island and the mainland to the wharves located on the shore of the mainland. The Government wharf provides a mooring face of 200 feet. This harbor provides a safe anchorage from practically all winds. Boats are specifically warned against using a secondary channel located between the centrally located island and the shores of the mainland due to the presence of a reef which is hazardous to navigate.

Hibbard Rock is a small rock rising about 12 feet above water, situated 1 mile southwest of Mamainse Point. It has no shallow water around it outside a distance of 150 feet. A channel 1,000 feet wide and 9 fathoms or more deep separates it from the shallow bank off Mamainse Point. **Hibbard (Sandy) Bay** is situated 1¼ miles south of Mamainse Point; the water is between 3 and 7 fathoms deep over hard bottom. The shore from Hibbard Bay to Coppermine Point is badly broken up and is mostly fronted by reefs lying from 600 to 900 feet offshore, with very little shallow water outside them, except in the immediate vicinity of the point.

Coppermine Point is about 34 miles northerly from the head of St. Marys River. Coppermine Point Light is located on the bluff at the northwest extremity of the point. A detached rock 30 feet high lies 2,000 feet northwest of the light. A shoal with 12 feet of water over it lies 1,500 feet northwesterly of this rock, and another with 6 feet over it lies 1,050 feet southeasterly of the same.

The shore from Coppermine Point southeasterly 4 miles to **Pancake Point** is fronted by shallow water for an average distance of 600 feet, but **Whisky Rock**, which is shallow, will be found northwesterly 4,200 feet from Pancake Point and ¼ mile offshore. From this to **Corbeil Point** located 10½ miles southeast of Coppermine Point Light, the shore is generally clean but not very deep-to. A shoal extends ⅞ mile southwesterly from Corbeil Point, near the outer end of which a rock with 14 feet depth, marked by a buoy, bears approximately 3,200 feet 206° from the point.

Batchawana Bay, lying to eastward of a line from Corbeil Point to Rudderhead Point, 5 miles southeasterly, is a deep landlocked indentation, with **Batchawana Island**, 5½ miles long east and west and 3¾ miles wide north and south, lying in the middle of it. There is a small fish dock, with about 8 feet of water, at the point about 1½ miles northeast of the light. On the inside of the north entrance point of the bay is an L-shaped Government wharf with the outside faces of the wharf and L measuring 120 feet and 80 feet respectively. Mooring is available on both sides of the wharf and there is a depth of 14 feet on the outside face but on the more protected inside faces the depth is only 11 feet. Shoal water extends ¾ mile from shore in the outer bay northwest of Batchawana Island. The entrance into the inner bay is through a narrow channel having 4 fathoms depth and passing between the northernmost point of the island and the main shore near the mouth of Batchawana River. Care should be taken in entering to avoid the shoal with a least depth of 10 feet, extending 1 mile in a southwesterly direction from the point south of the mouth of Batchawana River. To the south of Batchawana Island an extensive flat having 8 feet available depth over it and reaching across to the mainland, closes this entrance into the inner bay for other than small craft.

A good passage may be found between the shore and Pancake Shoals and Sandy Islands. This passage is marked by the buoy off Corbeil Point, described above, the buoy off Pancake Shoal, the ice buoy off North Sandy Island, and the ice buoy off South Sandy Island. The ice buoys remain in place the year around and the lighted buoy is replaced in winter by an appropriate ice buoy.

Pancake Shoal is a dangerous reef of considerable extent, with 3½ feet least depth over solid rock, lying 4¾ miles southwesterly from Pancake Point and nearly the same distance southerly from the light on Coppermine Point; the reef is marked on its northerly edge by a buoy. **Outer Pancake Shoal** is situated southwesterly 5½ miles from Coppermine Point Lighthouse; the least depth over it is 15 feet, and shoal water extends thence south 2,400 feet. The shoal is marked on the westerly side by a buoy.

North and South Sandy Islands lie about 4¼ miles to westward of Rudderhead Point and, with the surrounding shoals and reefs, extend in a north and south direction about 5¼ miles and east and west about 2 miles. The bank with less than 18 feet depth reaches 2¼ miles northwesterly off the north point of North Sandy Island, and is marked by an unlighted buoy moored at the most northerly extent of the shoal. An ice buoy is situated about 3,000 feet southeasterly of South Sandy Island to aid in defining the westerly side of the passage described above.

The coast from Rudderhead Point 10 miles south to **Goulais Point** is deep-to except at **Maple Island**, which is connected with the main shore by a boulder reef. The small bay south of **Maple Island** is also shallow and stony. A light 29 feet above high water on a steel lattice tower is located on the west side of Maple Island.

Goulais Bay, lying within **Goulais Point** and opening to the southwest, is 2¾ miles wide at the mouth, has an average depth of 9 fathoms inside, and affords good anchorage and protection from all winds. **Goulais Point** is marked by a light mounted 22 feet above water on a circular mast with a white day mark. A small Government wharf, 168 feet long, with 5 feet of water alongside, has been built in front of the village. Shoal water extends ¾ mile from the shore eastward of Goulais Point. The head of the bay north of the mouth of Goulais River is shallow within 1½ miles from shore. There are no outlying dan-

gers on the south shore of the bay. The coast continues steep-to to within 1 mile of Gros Cap, at the head of St. Marys River, and can be approached to within ¼ mile. In the small bay south of Gros Cap there is a breakwater wharf 155 feet long with a dredged depth of 6 feet. The channel center is marked by a line of day beacons.

Ile Parisienne, Ontario, 5 miles long north and south and ½ to 1⅛ miles wide, is near the middle of Whitefish Bay and lies to the east of the United States-Canada boundary line. On the southwest extremity of the island is a light; an air fog diaphone sounds as required. The recommended upbound course from Gros Cap Reefs Light to Whitefish Point for vessels bound for Canadian ports, passes within 1½ miles of the south point of this island. A fog horn sounding as required, and a radio beacon operating on 316 kc/s continuously the year round, are located at Gross Cap Reefs Light. A submerged cable extends from Gros Cap Light on a bearing of 055° to the mainland. Careful examinations made by the United States Lake Survey over the area of the recommended sailing courses westerly of the island showed nothing less than 100 feet of water to within 1 mile, and nothing less than 21 feet to within ⅜ mile, of the island. Parisienne Shoal with 7 feet least depth, extending 1 mile in an east and west direction, lies with its western extremity 2⅞ miles northeasterly from Ile Parisienne. A buoy is moored on its east edge.

14. HUDSON RIVER, NEW YORK CANALS, AND LAKE CHAMPLAIN

Hudson River, N.Y.—The total length of navigable river from the mouth in New York City, to Waterford, at the junction of the Erie and Champlain branches of the New York State Barge Canal System, is about 154.4 miles. The head of navigation for the tidal portion of the river is at the Federal dam at Troy. Approximately 2.4 miles above the dam at Troy is the junction of the Erie and Champlain Canals. The pool formed by this dam is essentially a part of the New York State Barge Canal System.

The Federal project depth in the lower 143½ miles is 32 feet in the channel from Albany, N.Y., to New York City. The average range of tides throughout the river varies between 3.1 and 4.9 feet. The lock at the Troy dam has usable dimensions of 485½ feet length (492½ feet for model-bowed boats) by 44.4 feet width, with 13 feet depth over the lower miter sill at lowest low water. The lift at lowest stages is 17.3 feet.

Anchoring of Vessels.—Cautionary Notice.—When coming to anchor vessels masters are cautioned not to foul submarine cables. Fouling cables may not only result in disrupting utility services to adjacent communities but also expose the mariner to the danger of high voltages carried by certain cables. Mariners are advised to slip the anchor rather than cut the cable if the normal practice of good seamanship fails to clear the fouled anchor. Lost gear or damaged cables should be reported to the authority having jurisdiction over the waterway.

Reference Planes.—The present reference planes are the lowest low water plane from the Troy dam to Albany, which is 3 feet below mean sea level (as revised October 12, 1939), and a mean low water plane of 1.75 feet below mean sea level from Albany, N.Y., to New York City. The plane above the Troy dam is pool level, which is the elevation of the crest of the lower section of the dam, or 14.3 feet above mean sea level.

Season of Navigation

The navigation season south of Troy extends usually from about April 1 to December 15, and north of Troy from about April 15 to December 1; during the remainder of the year, the river is generally closed by ice. Detailed data regarding movement through the New York State Barge Canal System may be obtained from the Office of the Director, Waterways Maintenance Subdivision, New York State Department of Transportation, State Campus, Building #5, 1220 Washington Avenue, Albany, New York 12232, phone number 518-457-4420.

Improvement Work.—The project for improvement by the United States provides for a channel 32 feet deep at mean low water and 600 feet wide from New York City to Kingston, N.Y.; thence 32 feet deep and 400 feet wide to Albany, N.Y.; thence 14 feet at lowest low water and generally 400 feet wide to the Troy Lock and Dam; and thence 14 feet deep and 200 feet wide to the southern limit of the State Barge Canal at Waterford, N.Y. (See Notices to Mariners and the latest editions of the charts for controlling depths.) **Complete information about the harbors and ports on the Hudson River, from New York to the Troy Lock and Dam, is contained in United States Coast Pilot 2, Cape Cod to Sandy Hook, published by the National Ocean Survey.**

National Weather Service Warning Display Station.—Signals are displayed at the upper west guard wall at the Federal Lock at Troy, N.Y.

Charts.—Charts of the Hudson River below Troy are published by the National Ocean Survey (formerly U.S. Coast and Geodetic Survey), Riverdale, Maryland 20840. A catalog of these charts may be obtained gratis.

Bridge Regulations.—See **33 U.S.C. 499**, published in Certain Laws, preceding, and **33 C.F.R. § 117.185** and **§ 117.190** of Rules and Regulations, preceding.

Navigation Regulations.—See **33 U.S.C. 1**, published in Certain Laws, preceding, and **33 C.F.R. § 207.50** of Rules and Regulations, preceding.

Distances Between Principal Points on New York Waterways.—See table on page T-7.

New York State Barge Canal System.—The New York State Barge Canal System, built by the State of New York, affords waterway communication without charge between the Hudson River and Lake Champlain on the east and Lakes Erie and Ontario on the west. Originally, the canals were largely artificial channels, with water supplied through feeders from natural drainage sources and controlled by locks and dams. In 1905 construction operations were begun to enlarge the old canals of limited size or supersede them by channels formed by improving natural water courses wherever feasible. The new canal

system was thrown open to traffic in the spring of 1918, and is comprised of the following divisions:

	Length	Locks
	Miles	*Number*
Erie Canal, from Troy Lock in Hudson River to Tonawanda on Niagara River	340.4	35
Champlain Canal, from Waterford (pool of Troy dam) on Hudson River to Whitehall on Lake Champlain	63	11
Oswego Canal, from Three River Point at head of Oswego River (confluence of Seneca and Oneida Rivers. 162.7 miles from Troy Lock) to Oswego on Lake Ontario	23.8	7
Cayuga and Seneca Canals, from Erie line at confluence of Seneca and Clyde Rivers to Ithaca on Cayuga Lake and Montour Falls on Seneca Lake, aggregating	92.5	4

The **Erie Canal** is 340.4 miles long. From Waterford, or the pool of the Troy dam in the Hudson River, westerly to Oneida Lake, the canal consists of a canalization of the Mohawk River and of a short reach of Wood Creek, alternating, however, with stretches of independent channel or land line where conditions render the same necessary or preferable. Passing through Oneida Lake and thence westerly to Lyons, the canal utilizes in part the Oneida, Seneca, and Clyde Rivers, with some land-line cut-offs to shorten and straighten the channel. Syracuse, which is not on the main line of the new route, has connection by a branch of 6.8 miles through Onondaga Lake and a section of Seneca River. The westerly portion of the Erie Canal, from Lyons to Tonawanda Creek at Pendleton, is artificial channel; thence to the Niagara River, Tonawanda Creek is utilized. (See Aids to Navigation paragraph following for changes in buoyage systems when proceeding from the Barge Canal into the Niagara River.) At Rochester, a 3.2 mile portion of the Genesee River has been improved and affords access from the canal to Rochester. It should be noted there is no navigable connection between the canal and Lake Ontario via the Genesee River. The navigable connection from Tonawanda to Buffalo is afforded by the Tonawanda Channel of the Niagara River and the Black Rock Canal.

From an elevation of about 15 feet above mean sea level in the pool of the lock and dam in the Hudson River at Troy, a flight of 5 locks at Waterford ascends 168.8 feet around Cohoes Falls into the Mohawk River; thence the canal ascends the Mohawk Valley by 14 locks an additional 236 feet to the summit level near Rome; thence descends 57 feet by 3 locks to Three River Point; and thence ascends 201 feet by 12 locks westward to the Niagara River.

The **Champlain Canal**, 60.4 miles long and opened for traffic 15 May 1916, was formed by canalizing the Hudson River from Waterford (at the eastern terminus of the Erie Canal) northerly to Fort Edward; thence a land cut across the divide at the summit level and the canalization of Wood Creek carry the route to Lake Champlain. From Waterford the canal ascends 124.8 feet by 8 locks to elevation 140 at the summit about 1.3 miles northeast of Fort Edward, and thence descends 43.5 feet by 3 locks to Whitehall on Lake Champlain.

The **Oswego Canal**, 23.8 miles long, is almost entirely a canalization of the **Oswego River**, which is formed by the confluence at the community of Three Rivers, New York, of the Seneca and Oneida Rivers, the latter two embraced in the Erie Canal. Navigation in the Oswego River is maintained in pools formed by dams. The chief land cut extends from the dam at Oswego to the harbor in Lake Ontario, separated from the river by a concrete wall. This canal descends 118 feet by 7 locks from Three River Point to Lake Ontario. (See description of Oswego Harbor, in Lake Ontario descriptions.)

The **Cayuga and Seneca Canals** are, in general, a canalization of the Seneca River and Cayuga and Seneca Lakes. The Cayuga Canal extends from the Erie Canal, near the confluence of the Seneca and Clyde Rivers, southerly to the foot of Cayuga Lake and through that lake to Ithaca. The Seneca Canal extends from the junction at the foot of Cayuga Lake up the Seneca River to and through Seneca Lake to Watkins Glen. These lakes are two of the so-called Finger Lakes of central New York, and are from 34 to 38 miles in length each. In entering Cayuga Lake, the dredging of a channel 5.1 miles long was necessary before water of sufficient depth was reached. At the head, or southerly end of Cayuga Lake, there is a spur of 1¾ miles to reach the city of Ithaca. From the Erie junction, the canals ascend 7.5 feet by 1 lock to **Cayuga Lake** and then 64.5 feet by 3 locks to **Seneca Lake**. Distances are as follows: From Erie junction to lock No. 1, 4.1 miles; from lock No. 1 through Cayuga Lake to Ithaca, 37.8 miles; from lock No. 1 through **Seneca River** and Lake to **Watkins Glen**, 47.8 miles. The spur, 2.5 miles long from Watkins Glen to Montour Falls, has been (1973) dredged by State forces to its project dimensions of 12 feet deep and 75 feet wide.

Research Activities.—Four private special purpose lighted mooring buoys, painted red and white, mark a barge moored in over 400 feet of water about 1.5 miles east-northeast of Dresden on Seneca Lake. Each buoy is about 100 feet away from the barge. Three private special purpose lighted mooring buoys, painted red and white, mark a barge moored in over 500 feet of water about 1.0 mile northeast of Long Point and 2.9 miles east-southeast of Dresden. Two of the buoys are 100 feet away from the barge and the other is about 1,500 feet away.

A second facility of barge and buoys is located ¼ mile southwest of Portland Pt. The barge and two mooring cables are each marked by a white buoy floodlighted at

Bridges Across the Hudson River

No.	Location and name	Kind	Miles above mouth of river	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	George Washington	Highway	11.0			3,418.0	252.1		Suspension.
2	Tappan Zee	do	27.0	501.2	501.2	1,100.0	141.6		Fixed.
3	Peekskill-Bear Mountain.	do	46.7			1,584.0	158.0		Suspension.
4	Newburgh-Beacon	do	62.0	550.0	550.0	960.0	168.0		Fixed.
5	Poughkeepsie	do	75.6	520.0	450.0	1,458.0	141.2		Suspension.
6	Poughkeepsie-New York, New Haven & Hartford RR.	Railway	76.1			490.0	170.8		Fixed.
7	Kingston-Rhinecliff	Highway	94.3	760.0	760.0		138.7		Do.
8	Catskill-Rip Van Winkle.	do	113.6			760.0	150.7		Do.
9	Castleton-Hudson River Connecting RR.	Railway	135.6	75.0	566.0	371.0	143.0		Do.
10	Castleton-New York Thruway.	Highway	135.7			565.0	139.9		Fixed.
12	South Mall Expressway	do	145.4			300.0	71.0		Fixed.
14	Albany-Penn Central (NYC) RR.	Railway	146.2	103.0	98.0		†32.0		Swing.
15	Albany-Patroon Isl	Highway	147.2			300.0	67.0		Fixed.
16	Troy-Menands	do	150.2			306.8	†65.3		Fixed.
16A	Troy-Watervliet bridge.	do	152.1			250.0	62.0	55.0	Fixed. Completed in 1972.
18	Troy-Green Isl. Delaware & Hudson RR.	Railway	152.7			167.0	†37.1		Lift.*
19	Troy-Cohoes	Highway	155.4	150.0	150.0	183.0	‡33.7		Bascule center span.
20	Troy-Waterford	do	156.6			176.0	‡22.9		Fixed.

†Clear height above lowest low water.
‡Clear height above mean low water equals pool level.
*Bridge has clearance when raised of 129.5 feet above lowest low water.

night. The barge is marked by four vertical lights, one showing fixed white and three showing fixed red.

Speed on Canals.—The speed limit on the New York State Barge Canal System was six (6) m.p.h. in 1976.

Where variances exist, the rates of speed will be indicated, so far as may be practicable, at locations preceding the affected area.

Any person violating this section shall be subject to a penalty of not to exceed $100 for each offense and the float involved in the violation may be refused passage through any lock or lift bridge on the canal system for a period of not less than three hours and not more than 24 hours by the lock or bridge official at which the float first appears following such violation.

Improvement Work.—The United States project for improvement provides for allotment of Federal Funds to the State of New York for expenditure under suitable Federal control and supervision in the improvement of that section of the canal system connecting the Hudson River with Lake Ontario. This section comprises the Erie Canal from the Hudson River to Three River Point, a distance of about 160.2 miles, and the Oswego Canal from Three River Point to Oswego, a distance of about 23.8 miles. The improvement consists of deepening between locks to 14 feet at a normal pool level, providing a depth of 13 feet below normal pool levels through all locks and guard gates, widening at bends and elsewhere, and increasing the overhead clearance to 20 feet above maximum navigable

stage at bridges and other overhead structures. The width of channel is 104 feet in earth cuts, 120 feet in rock cuts and 200 feet in river and lake sections. This project was completed in 1968.

Available Dimensions of Channels and Locks.—Except for the improved section between the Hudson River and Lake Ontario, the provided depth of channels on all canal routes is 12 feet below normal pool level; the minimum widths are 75 feet in earth, 94 feet in rock, and generally 200 feet in canalized rivers. The maximum usable dimensions of the locks are 300 feet length and 43½ feet width. The depth over miter sills of locks and guard gates is 12 feet at normal pool level. The maximum height above water of vessels navigated on the canal system shall not exceed the vertical overhead clearance of canal structures. The lock lifts range from 6 feet to 40.5 feet, the average being 17.7 feet. The guard gates at various points have a pier in midchannel with clear passage of 55 feet on each side. A least horizontal clearance of 50 feet is found at the New York Central Railroad bridge across the Mohawk River at Schenectady.

Bridges.—For the most part the bridges are fixed structures, except where local conditions as to grades render other types preferable. The bridges crossing the canal system are distributed as follows:

Section	Number of bridges	Least clearance—in feet	
		Horizontal	Vertical
Champlain Canal (Waterford to Whitehall)	28	45	15.5
Erie Canal between Troy and Three River Point	69	45	20.0
Oswego Canal between Three River Point and Oswego	11	45	20.0
Erie Canal between Three River Point and Tonawanda	172	45	15.5
Cayuga and Seneca Canals	17	45	15.5
	297		

Terminals.—Terminals have been constructed at Troy, Whitehall, Amsterdam, Utica, Rome, Syracuse, and the principal villages along the Barge Canal. A grain elevator with a capacity of 1,000,000 bushels is in use at Oswego under jurisdiction of the Port of Oswego Authority.

Aids to Navigation.—As a considerable part of the Barge Canal is constructed through natural waterways and consists of channels bordered by shallower water, numerous aids to navigation are maintained by the State to mark the navigable courses. These comprise lighthouses, range towers, beacons, spars with reflectors, and buoys with lights and reflectors. The arrangement of aids considers the entire canal system as a waterway extending from the Hudson River to interior parts of the State. All red lights and red beacons and buoys appear on the right or starboard hand, and all white lights and white beacons and buoys, appear on the left or port hand when proceeding up or away from the Hudson River, or away from the main line in the branches. This arrangement extends westerly to Tonawanda on the Niagara River. However, the buoyage in the Niagara River is based on the principle that "proceeding from seaward" is proceeding from Lake Erie toward the Niagara Falls. Mariners are therefore reminded, after exit from the Barge Canal into the Niagara River, keep red buoys to port and black buoys to starboard when continuing on to Lake Erie.

Charts.—Two charts have been prepared and placed on sale by the National Ocean Survey, showing the natural navigable waters embraced in the canal system, as follows: No. 14788, Oneida Lake; No. 14791, Cayuga and Seneca Lakes. In addition, there is available a looseleaf style bound volume of charts, No. 14786, measuring 11 x 17½ inches, covering all of the canals east of Lyons to Troy, N.Y., and up through the waterways, including the Champlain Canal, to Whitehall at the south end of Lake Champlain. Since the charting project is authorized to cover only the natural waters of the canal system, neither the single charts nor the bound volume include the Erie Canal from Lyons to the Niagara River which is of artificial formation.

The Waterways Maintenance Subdivision, State Department of Transportation, Albany, N.Y., issues a map containing descriptions of the routes and structures and a leaflet containing the basic rules and regulations governing navigation of the canal system.

New York State Pumpout Facilities.—The Watercraft Pollution Control Program in New York State is administered by the New York State Dept. of Environmental Conservation, 50 Wolf Road, Albany, N.Y. 12205. A listing of the pumpout facilities within the State are available from that office.

National Weather Service Warning Display Stations.—Display Stations on the New York State Barge Canal System are as follows: (1) At the Trade-a-Yacht Marina, Brewerton, with the flags floodlighted at night. (2) In Onondaga Lake Park, Liverpool, N.Y., on a flagpole 26 feet high, 200 feet west of the marina office in the park.

Lake Champlain, N.Y., and Vt., and Route to St. Lawrence River via Richelieu River.—Lake Champlain, through the connection at its head or southerly end with the New York State Barge Canal System and the Hudson River, and through its northerly outlet to the St. Lawrence River via the Richelieu River and the Chambly Canal, forms part of an international waterway for commerce between the United States and Canada. Gasoline is available from dockside pumps, at practically all ports.

A narrow arm at the southerly end of the lake, designated the Narrows, is the link which connects with the New York State Barge Canal System at Whitehall; the length of the Narrows from the latter place northerly to

Crown Point at the south end of the main or so-called broad lake being about 30.6 miles. There is but little current in the Narrows at any time, due to there being no large tributary streams. The lake level is subject to variation from year to year, with long-time range varying from a minimum of 0.6 foot below to a maximum of 8.8 feet above the reference plane of low lake level. During each year the level has a seasonal rise and fall of from 4 to 5 feet, the lowest stage occurring in September or October and the highest stage in April or May.

Reference Plane.—The depths given in descriptions for Lake Champlain are referred to the plane of low lake level, which is an elevation 93.0 feet, referred to Mean Sea Level, 1929 datum.

Channel at the Narrows-General Conditions.—The channel is marked with Coast Guard aids to navigation from Whitehall to the International Boundary. In the southerly 13.2 miles of the Narrows from Whitehall to Benson Landing, the bed of the waterway, lying between mainland banks from 300 to 1,200 feet apart, consists of marshy flats traversed by a narrow channel or channels of open water. The project for improvement by the United States provides for a channel 12 feet deep from Whitehall to Benson Landing, with a general width of 200 feet and increased width at various bends, and also for fender booms at certain sections of the rocky banks. Work of widening and straightening the channel in accordance with the Government project has not been completed to the extent authorized.

The limiting available depths at low lake level, as of June 1968, in that section of the waterway under improvement, were as follows:

Locality	Depth	Width
	Feet	*Feet*
Lock No. 12 to the Elbow	12.0	150-250
At the Elbow	12.0	100
The Elbow to Benson Landing	10.6	100-150

The channel has been considerably straightened and widened at the bends and two new channels have been dug, one at Whitehall to relieve the bend around the "Elbow," and one at Maple Bend to relieve the curve at that place. North of Benson Landing, the natural channel of the Narrows is of ample width and depth to Crown Point, at the south end of the broad lake.

The distance from Crown Point northerly through the broad lake to the International Boundary near Rouses Point is about 76 miles, with deep water available. Prominent points and shoals throughout the lake are marked by lights and buoys, as shown by the charts published by the National Ocean Survey, and as described in the Local Notice to Mariners published by the Commander, Third Coast Guard District, Governors Island, New York 10004. Ferris Rock Lighted Buoy, located about 2¼ miles 094½° from Port Kent ferry dock marks the location of a rock awash. The rock is about 8 to 10 feet in diameter and is located about 300 feet south of the buoy.

The principal ports on the broad lake are Port Henry, N.Y., near the south end; Burlington, Vt., and Plattsburgh, N.Y., near mid-length; and Rouses Point, N.Y., near the International Boundary at the north end. These harbors are separately described below.

Charts.—There are 5 charts covering the area north from Whitehall, N.Y., to the Richelieu River, Ont.; Chart 14784, from Whitehall, N.Y. to Barber Point, N.Y.; Chart 14783, from Barber Point, N.Y. to Four Brothers Islands; Chart 14782, from Four Brothers Islands to Cumberland Head, N.Y.; Chart 14781, from South Hero Island, Vt. to the Richelieu River, Ont.; Chart 14785, Burlington Harbor, Vt. For Canadian charts of areas north of the International Boundary, consult the Canadian Hydrographic Service, 615 Booth Street, Ottawa, Ontario.

Anchorage Regulations.—See 33 C.F.R. § 110.1 and § 110.8 of Rules and Regulations, preceding.

Bridge Regulations.—See 33 U.S.C. 499, published in Certain Laws, preceding and 33 C.F.R. § 117.191 of Rules and Regulations, preceding.

Tributaries of Lake Champlain.—The principal tributaries on the Vermont side of the lake are the Missisquoi, Lamoille, Winooski, Poultney, Pawlet, and La Platte Rivers and Otter and Little Otter Creeks. The Missisquoi River is navigable to Swanton, a distance of 6 miles, but at low stages will accommodate only small motorboats drawing 1 or 2 feet. A greater depth, 2 to 12 feet, is available by traveling via Dead Creek which is an alternate outlet of the Missisquoi River. Similar conditions exist on the Lamoille and Winooski Rivers. Otter Creek is navigated to Vergennes, a distance of 8 miles, by small launches, the average depth being about 6 feet. There is no evidence of navigation on the other streams mentioned, which are sluggish except during spring high water.

The principal tributaries on the New York side of the lake are the Great Chazy, Little Chazy, Saranac, Au Sable, Little Au Sable, and Bouquet Rivers, and Ticonderoga Creek. The Great Chazy River is navigable as far as Champlain, about 6 miles, but at low stages, only for small boats drawing 2 or 3 feet. Small motorboats are able to go up the Bouquet River and Ticonderoga Creek for about a mile during high stages. Normally, the approach to Ticonderoga Creek is very shoal and weedy and is not recommended for traveling except for outboards. No navigation is known to exist on the other streams mentioned.

Sand formations at the mouths of practically all the streams control the entrance of boats during the low summer stages.

Cable Ferry.—Fort Ticonderoga Ferry crosses the lake about 1.7 miles above Ticonderoga Creek. The ferry barge is towed by a tug and guided across the lake by two cables which are fixed on either shore. Passing through guides and carrier wheels on the ferry, the cables are dropped to the bottom astern and picked up ahead. The cables reach the bottom about 400 feet from either end of the ferry thus allowing vessels to pass by the moving ferry. The tug and barge are marked by lights, and signs on both and along the shore warn vessels of the presence of the ferry

Bridges Across Lake Champlain

No.	Location and name	Kind	Miles From Whitehall	Draw or span openings—clear width in feet proceeding upstream			Clear height in feet above water datum		Remarks
				Right	Left	Center	Low	High	
1	Whitehall, South Bay-Delaware & Hudson RR.	Railway	2.5	21.5	29.0	96.0	11.0		Fixed.
2	Whitehall, South Bay	Highway	3.2	25.0	90.0		9.6		Bascule and fixed.
*3	Crown Point-Chimney Point.	do	36.7			186.0	91.9		Fixed.
4	Colchester-South Hero Island.		78.1			177.0			Swing span and center pier removed.
5	Sand Bar	Highway	82.6			54.9	15.0		Fixed.
6	South Hero-North Hero Islands.		90.1	80.0	80.0				Swing span removed.
7	South Hero-North Hero Islands.	Highway	91.8			80.0	20.5		Bascule.
8	Pelot Point-Alburg Tongue.		95.7	77.0	77.0				Swing span removed.
9	North Hero-Alburg Tongue (South Alburg).	Highway	99.2			70.5	25.0		Fixed.
10	Isle La Motte-Alburg Tongue.	do	99.4			40.0	10.0		Do.†
11	Missisquoi Bay-Central Vermont Ry.	Railway	105.6			36.9	10.5		Swing. **
12	Missisquoi Bay (East Alburg).	Highway	105.9			45.0	18.0		Bascule.
*13	Rouses Point.		106.6			197.0			Swing span and center pier removed.
*14	Rouses Point	Highway	106.8	126.9	126.9		22.5		Swing.

†Channel passage marked by 2 red lights 30 feet apart and a center green light. All lights suspended below the bridge.

*Only bridges Nos. 3, 13, and 14 are across the direct route through the lake proceeding from the Hudson River to the St. Lawrence River.

**See 33 C.F.R. § 117.191(b) of Rules and Regulations, preceding.

and the cables. **Extreme caution is advised when passing the cable ferry. The ferry should never be passed closeby.**

Chart 14784.—Port Henry, N.Y.—Situated on the western side of Lake Champlain, 38.7 miles from the southern extremity at Whitehall and 68 miles southerly from the Canadian boundary line.

Channels.—A dredged basin off the harbor front is entered from deep water southward. The State of New York has dredged an area northward of the basin at the barge canal terminal and thence a channel leading eastward to deep water. In 1967, the maximum depth available in all parts of the Federal and state project was 12 feet.

Aids to Navigation.—A light is maintained at the outer end of the barge-canal terminal.

Harbor Facilities.—At the north end of the harbor the State of New York has constructed a timber and concrete, sandfilled pier 500 feet long, extending out from and normal to the shore line on bearing 130° which serves as a breakwater as well as a terminal. At the south end of the harbor the Republic Steel Corp. has a concrete dock with length of about 850 feet along the waterfront.

Bulwagga Bay, N.Y.—The entrance to Bulwagga Bay, about 1¼ miles south of the canal dock, is foul with submerged piles and cribs. In 1967, some of the submerged structures had been marked by local interests.

Charts 14782, 14785.—Burlington Harbor, Vt.—This harbor is located in a half-moon indention on the eastern side of Lake Champlain, 70.7 miles from the southern end, about 41 miles south of the Canadian boundary line and 20 miles southeast of Plattsburgh, N.Y. The harbor is about ¼ mile wide and extends about ¾ mile along the waterfront of the city.

Channels.—Two detached breakwaters paralleling the shore protect the city waterfront from the west and provide good anchorage. The controlling depths are 6 to 12 feet off the wharves increasing to much greater depths at the breakwaters.

Harbor Facilities.—The terminal facilities, including the wharves, are operated by various oil companies.

There is a small boat basin just south of the ferry dock in Burlington. Fuel, water, ice, a launching ramp, and pump-out facilities are available in this basin.

Aids to Navigation.—A light marks the north end of the northerly section of the breakwater; a fog horn sounds as required.

Coast Guard Station.—Burlington Coast Guard Station is 1,650 feet east of Burlington Harbor North Breakwater Light, on Battery Park.

Local Harbor Regulations are established by the Burlington City Council and are enforced by the **harbormaster** who may be reached at City Hall. A **speed limit** of 5 m.p.h. is enforced in the small-boat basin. Copies of the regulations may be obtained from the Mayor, City Hall, Burlington, Vermont 05401.

National Weather Service Warning Display Station.—Signals are displayed at the Coast Guard Station near the north end of the harbor in Burlington, Vt.

Shelburne Bay, Vt.—This bay is about 3 miles south of Burlington Harbor and is bounded on the west by Shelburne Point. Marine fuels, pumpout, and repair facilities, including a marine railway to handle boats up to 100 feet in length, are available on the northeast end of Shelburne Point.

Anchorage Regulations.—See **33 CFR § 110.8** of Rules and Regulations, preceding.

Caution Area.—Amphibious and Air Rescue Training operations of Detachment 18, 48 ARRS [Aerospace Rescue and Recovery] (MAC), Plattsburgh AF Base, are conducted in an area near midlake due west of Burlington Harbor. Schuyler Reef, Appletree Shoal, Juniper Island, and Four Brothers Islands are approximately at the corners of the zone. Mariners are advised to consult the Third Coast Guard Notices to Mariners for schedule of operations, exact limits of the area, and instructions.

Chart 14782.—Plattsburgh Harbor, N.Y.—Located along the westerly shore of Cumberland Bay, an arm of the west side of Lake Champlain, 85.7 miles from the southern end and 26 miles south of the Canadian boundary line.

Channels.—The dredged basin along the city waterfront is protected from the east by a detached breakwater paralleling the shore. The controlling depths are 5 to 9 feet at the wharves increasing to 12 feet at the breakwater. The protected area of the harbor provides good anchorage.

Aids to Navigation.—A lighted buoy marks the southwesterly end of the breakwater. A light and an electric fog horn sounding as required, are located on the northeasterly end of the breakwater.

Harbor Facilities.—A small boat basin is located just west of the breakwater. Marine fuel, pumpout, and repair facilities are available in this basin.

New York State Barge Canal Terminal.—About a mile north of the United States breakwater, the State of New York has extended the shore and built a terminal pier and a breakwater as a protection from southerly storms. The terminal pier, 200 feet wide and 400 feet long, extending 048° into the bay to a point 800 feet from the original shore line, is an earth fill within concrete walls built on stone-filled cribs. From a point 200 feet southeast of the terminal pier the breakwater extends about 700 feet, 078°, its outer end being about 1,300 feet from the original shore line. The breakwater is an earth mound 100 feet wide, its slopes being covered with heavy riprap.

The protected basin between these two structures, 440 feet long, with width reducing from 400 feet at the outer end to 200 feet at the inner end, was dredged to a depth of 12 feet on the south side of the terminal pier. In May 1977, the south side had a reported depth of 12 feet. From the terminal basin, a channel 150 feet wide and 12 feet deep, extends 137° to deep water in the bay.

Range lights on the northwesterly shore of the bay mark the axis of the dredged channel. The outer ends of the terminal pier and the breakwater are each marked by a light.

Chart 14781.—Rouses Point Harbor, N.Y.—Located on the western side of Lake Champlain, 110 miles from the southern end and 1.5 miles south of the Canadian boundary line, in an open bay formed by the 2-mile length of receding coastline north of Stony Point. The harbor is protected on the south by Stony Point and the detached breakwater extending northeasterly therefrom and on the north by a pile railroad trestle.

Anchorage bottom in the harbor is good, and there are depths of 6 to 8 feet in all seasons of the year except for depths of 4 feet or less on the reef which extends 0.5 mile southward from the point which encloses the north end of the harbor.

Harbor Facilities.—Near the north end of the harbor the State of New York has built a barge-canal terminal pier, of stone-filled cribs with concrete superstructure, extending from the original shore line about 550 feet, 135°.

About 550 feet northerly from the barge-canal terminal, the Rutland Railroad pier projects from the shore line about 500 feet, 130°. This is a timber structure about 90 feet wide, and is in poor condition. There is an available depth of about 8 feet at its outer end and for several hundred feet along its northerly side. A protected basin is formed between the pier and the abandoned railroad approach to the trestle crossing the lake, which is about 300 feet north of the pier. About 200 feet of the lakeward area of this basin is usable, with prevailing depths of about 6 to 8 feet; the remainder is shallow and blocked with sunken canal boats.

Aids to Navigation.—A flashing light marks the outer end of the breakwater at Stony Point.

Richelieu River, Que.—and Chambly Canal.—From the International Boundary line at the northerly end of Lake Champlain, the distance is about 80 miles to the outlet of the Richelieu River into the St. Lawrence River at Sorel, 46 miles below Montreal. The river has been rendered navigable by the construction of the Chambly Canal in its upper reach and the St. Ours lock and dam in its lower course. Bridges over the waterway are provided with draws. The size of vessels that can navigate this route is controlled by the least dimensions of the Chambly Canal locks, below given. From the international boundary to the head of the Chambly Canal there is a length of 22 miles of navigable river.

The Chambly Canal is 11¾ miles long and overcomes the rapids between Chambly and St. Johns by means of 1 guard lock and 8 lift locks with total lift or lockage of 80 feet. The limiting dimensions of the smallest locks are: Usable length, 112 feet; width 22½ feet; depth on sills, 6½ feet. The breadth of the canal is 36 feet at the bottom and 60 feet at the water surface. The minimum overhead clearance is 29 feet, under a bridge across the Chambly Canal and Richelieu River in the vicinity of St. Johns, P.Q. From the foot of the canal to St. Ours Lock there is a stretch of 32 miles of river, with navigable depth of 12 feet in 1969.

Effective 27 May 1975, permits and toll charges were made applicable to the Chambly Canal and St. Ours Lock. Complete information is available from the Superintendent, Quebec Canals, Parks Canada, 200 Churchill Blvd., Greenfield Park, Que. J4V 2M4.

At St. Ours, 14 miles above the mouth at Sorel, the Richelieu River is divided by a small island into two channels. The western channel is closed by a dam 635 feet long. St. Ours Lock, located in the eastern channel, is 339 feet long (311 feet available) by 45 feet wide, with 12 feet of water on the sills and total lift of 5 feet. In 1969, a draft of 12 feet was available from St. Ours Lock to the St. Lawrence River at Sorel, Quebec.

Charts.—Charts and Pilots for the Richelieu River, Chambly Canal, and other Canadian waters are available from the Canadian Hydrographic Service, Survey and Mapping Branch, Department of the Environment, 615 Booth St., Ottawa, Canada. Canadian Information Bulletin 1 is a free index to the nautical charts of the Great Lakes and Adjacent Waterways in Canada and is available from the Canadian Hydrographic Service.

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APPENDIX

Sales Information.—National Ocean Survey publications and nautical charts are sold by NOS and its authorized sales agents in many ports of the United States and in some foreign ports. Mail orders should be addressed to National Ocean Survey, Distribution Division (C44), 6501 Lafayette Avenue, Riverdale, Md. 20840, and accompanied by a check or money order payable to NOS, Department of Commerce. Remittance from outside the U.S. should be made either by an International Money Order or by a check payable on a U.S. bank. Chart catalogs, which include a listing of authorized sales agents, are free upon request. The National Ocean Survey maintains over-the-counter cash sales offices at 6501 Lafayette Avenue Riverdale, Md.; at 6001 Executive Boulevard, Room 101, Bldg. 1, Washington Science Center, Rockville, Md. (small orders only); at 439 West York Street, Norfolk, Va.; at 1801 Fairview Avenue East, Seattle, Wash.; and at 632 Sixth Avenue, Room 303, Anchorage, Alaska.

National Ocean Survey Offices

Rockville (Headquarters): Director, National Ocean Survey, National Oceanic and Atmospheric Administration, 6001 Executive Boulevard, Rockville, Md. 20852.

Norfolk: Director, Atlantic Marine Center, NOS, National Oceanic and Atmospheric Administration, 439 West York Street, Norfolk, Va. 23510.

Seattle: Director, Pacific Marine Center, NOS, National Oceanic and Atmospheric Administration, 1801 Fairview Avenue East, Seattle, Wash. 98102.

Publications and Charts—National Ocean Survey

Nautical Charts (See Chart Catalogs)

United States Coastal and Intracoastsal waters, and possessions.

Great Lakes, Lake Champlain, New York State Canals, and the St. Lawrence River-St. Regis to Cornwall, Canada.

Publications (See Chart Catalogs for latest editions and prices)

Coast Pilots

U.S. Coast Pilot 1, Atlantic Coast, Eastport to Cape Cod.

U.S. Coast Pilot 2, Atlantic Coast, Cape Cod to Sandy Hook.

U.S. Coast Pilot 3, Atlantic Coast, Sandy Hook to Cape Henry.

U.S. Coast Pilot 4, Atlantic Coast, Cape Henry to Key West.

U.S. Coast Pilot 5, Atlantic Coast-Gulf of Mexico, Puerto Rico, and Virgin Islands.

U.S. Coast Pilot 6, Great Lakes, Lakes Ontario, Erie, Huron, Michigan and Superior, and St. Lawrence River.

U.S. Coast Pilot 7, Pacific Coast and Hawaii.

U.S. Coast Pilot 8, Alaska-Dixon Entrance to Cape Spencer.

U.S. Coast Pilot 9, Pacific and Arctic Coasts, Alaska-Cape Spencer to Beaufort Sea.

Distance Tables

Distances Between United States Ports, Sixth (1978) Edition.

Water Levels

Great Lakes Water Levels (Daily and Monthly Average Water Surface Elevations), published annually.

Great Lakes Water Levels (Monthly and Annual Average Water Surface Elevations, 1860–1970), published every 5 years.

Hydrograph of Lake Levels, a hydrograph of monthly mean levels of the Great Lakes from 1860 to date and of Lake St. Clair from 1898 to date.

Publications and Charts—Other U.S. Government Agencies

A partial list of publications and charts considered of navigational value is included for the ready reference of the mariner. In addition to the agents located in the principal seaports handling publication sales, certain libraries have been designated by the Congress of the United States to receive the publications as issued for public review.

Nautical Charts

Black Warrior-Tombigbee Rivers System: Published and for sale by U.S. Army Engineer District, Mobile, Ala.

Alabama River: Published and for sale by U.S. Army Engineer District, Mobile, Ala.

Mississippi River (Cairo, Ill., to Gulf of Mexico): Published and for sale by Mississippi River Commission, Vicksburg, Miss.

Mississippi River (Cairo, Ill., to Minneapolis, Minn.) and Illinois Waterway (Mississippi River to Lake Michigan): Published and for sale by the U.S. Army Engineer District, Chicago, Ill.

Foreign Waters: Published by Defense Mapping Agency Hydrographic/Topographic Center (DMAHTC); for sale by Defense Mapping Agency Office of Distribution Services, Washington, D.C. 20315, and its sales agents.

Marine Weather Services Charts: Published by the National Weather Service; for sale by NOS and its sales agents.

Publications

Water Levels

Monthly Bulletin of Lakes Levels for the Great Lakes, showing current level of the Great Lakes and Lake St. Clair, levels of the prior 12 to 23 months, and probable levels of the next 6 months: Published by and available without charge from the Department of the Army, Detroit District, Corps of Engineers, P.O. Box 1027, Detroit, Mich. 48231.

Great Lakes and Connecting Channels Water Levels and Depths, a twice monthly bulletin that provides forecast channel depths of the Great Lakes for navigation

purposes: Published by and available without charge from the Department of the Army, Detroit District, Corps of Engineers, P.O. Box 1027, Detroit, Mich. 48231.

Sailing Directions (Foreign Countries): Published by Defense Mapping Agency Hydrographic/Topographic Center (DMAHTC); for sale by Defense Mapping Agency Office of Distribution Services and its sales agents.

Notices to Mariners may be obtained free from the following: Local Notices to Mariners—District Commander of the local Coast Guard district; Weekly Notice to Mariners, coasts of the United States, Possessions, and foreign—Defense Mapping Agency Office of Distribution Services; Local Notice to Mariners, Great Lakes—Commander, Ninth Coast Guard District, Cleveland, Ohio.

Special Notice to Mariners are published annually in Notice to Mariners 1. These notices contain important information of considerable interest to all mariners. Interested parties are advised to read these notices.

Light Lists (United States and Possessions): Published by U.S. Coast Guard; for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Light Lists (Foreign Countries): Published by Defense Mapping Agency Hydrographic/Topographic Center (DMAHTC); for sale by Defense Mapping Agency Office of Distribution Services and its sales agents.

Radio Navigational Aids, Atlantic and Mediterranean Area (Pub. 117A), Pacific and Indian Oceans Area (Pub. 117B): Published by Defense Mapping Agency Hydrographic/Topographic Center (DMAHTC); for sale by Defense Mapping Agency Office of Distribution Services and its sales agents.

Worldwide Marine Weather Broadcasts: Published by the National Weather Service; for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

The Nautical Almanac, The Air Almanac, and **American Ephemeris and Nautical Almanac:** Published by the Naval Observatory; for sale by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

American Practical Navigator (Bowditch) (Pub. No. 9) and **International Code of Signals** (Pub. No. 102): Published by the Defense Mapping Agency Hydrographic/Topographic Center (DMAHTC); for sale by Defense Mapping Agency Office of Distribution Services and its sales agents.

Rules of the Road: Navigation Rules, International—Inland (CG-169). Rules of the Road, Western Rivers (CG-184). Rules of the Road, Great Lakes (CG-172): Published by and free on application to the U.S. Coast Guard.

Port Series of the United States: Published and sold by Corps of Engineers, U.S. Army, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Va. 22060.

Official **U.S. Coast Guard Recreational Boating Guide** (CG-340): Published by U.S. Coast Guard; for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Marine Radio Telephony—How to correctly operate your radiotelephone set in the 2 MHz band; and Maritime Mobile VHF-FM Radio Telephony—Usage in the United States: Published by Radio Technical Commission for Marine Services; for sale by RTCM Services, c/o Federal Communications Commission, P.O. Box 19087, Washington, D.C. 20036.

U.S. Government Agencies

Corps of Engineers Offices

Buffalo District: 1776 Niagara Street, Buffalo, N.Y. 14207.

Chicago District: 219 S. Dearborn Street, Chicago, Ill. 60604.

Detroit District: Patrick McNamara Bldg., 477 Michigan Avenue, Detroit, Mich. 48231.

New England Division: 424 Trapelo Road, Waltham, Mass. 02154.

St. Paul District: 1135 USPO & Customhouse, St. Paul, Minn. 55101.

Environmental Protection Agency (EPA) Offices.—Regional offices and States in the EPA coastal regions and Great Lakes:

Region I (New Hampshire, Maine, Massachusetts, Connecticut, Rhode Island, Vermont): J. F. Kennedy Federal Bldg., Room 2303, Boston, Mass. 02203.

Region II (New Jersey, New York, Puerto Rico, Virgin Islands): 26 Federal Plaza, Room 1009, New York, N.Y. 10007.

Region III (Delaware, Maryland, Virginia, District of Columbia, Pennsylvania): Curtis Bldg., 6th and Walnut Streets, Philadelphia, Pa. 19106.

Region V (Illinois, Indiana, Michigan, Minnesota, Ohio and Wisconsin): 230 South Dearborn Street, Chicago, Ill. 60604.

Coast Guard District Offices

Commander, Third Coast Guard District, Governors Island, New York, N.Y. 10004. Coastal waters and tributaries of Rhode Island from Watch Hill, Connecticut, New York, New Jersey, Pennsylvania, and Delaware, including Fenwick Island Light, but not including that portion of Delaware containing the reaches of the Nanticoke River and the Chesapeake and Delaware Canal.

Commander, Ninth Coast Guard District, 1240 East 9th Street, Cleveland, Ohio 44199. Michigan, New York north of 42° N. and west of 74°39′ W.; Pennsylvania north of 41° N. and west of 78°55′ W.; that part of Ohio and Indiana north of 41° N.; that part of Illinois north of 41° N. and east of 90° W.; Wisconsin, except that part south of 46°20′ N. and west of 90° W.; and that part of Minnesota north of 46°20′ N.

Note: Marine Safety Office includes Captain of the Port, Marine Inspection Office, and Documentation Office; (I) means Marine Inspection Office is at the same address; (D) means Documentation Office is at the same address.

Coast Guard Marine Safety Offices

Buffalo, N.Y.: Federal Bldg., Room 1111, 111 W. Huron Street 14202.

Cleveland, Ohio: 1055 East Ninth Street 44114.

Detroit, Mich.: 550 Patrick V. McNamara Bldg., 447 Michigan Avenue 48226.

Duluth, Minn.: Canal Park 55802.

Toledo, Ohio: Federal Bldg., Room 501, 234 Summit Street 43604.

Coast Guard Captains of the Port

(D) Chicago, Ill.: 610 South Canal Street 60607.

(D) Milwaukee, Wis.: 2420 S. Lincoln Memorial Drive 53207.

Muskegon, Mich.: Fulton Avenue and Bluff Street 49441.

Sault Ste. Marie, Mich.: c/o U.S. Coast Guard Group 49783.

Coast Guard Marine Inspection Offices

(D) St. Ignace, Mich.: Municipal Bldg. 49781.

Coast Guard Documentation Offices

Cleveland, Ohio: 601 Rockwell Avenue, Room 455, 44114.

Ludington, Mich.: 218 W. Ludington Avenue 49431.

Oswega, N.Y.: Federal Bldg., Room 208, 13126.

Coast Guard Stations.—The stations listed are in the area covered by this Coast Pilot. They have search and rescue capabilities and may provide lookout, communications, and/or patrol functions to assist vessels in distress. The National VHF-FM Distress System provides continuous coastal radio coverage outwards to 20 miles on channel 16 (156.80 MHz). After contact on channel 16, communications with the Coast Guard should be on channel 22 (157.10 MHz). If channel 22 is not available to the mariner, communications may be made on channel 12 (156.60 MHz). Selected stations guard the International Radiotelephone Distress, Safety and Calling Frequencies.

St. Lawrence River:

Alexandria Bay, N.Y. (44°19.9′ N., 75°56.1′ W.). On the southern shore of Wellesley Island, 1,400 feet west of Light 195 on Cherry Island.

Lake Ontario:

Sackets Harbor, N.Y. (43°56.9′ N., 76°07.3′ W.). On the southerly side of the harbor, about 800 feet south of Navy Point Light. (Seasonal; no continuous radio guard.)

Oswego, N.Y. (43°27.8′ N., 76°31.0′ W.). On south side of basin about 0.7 mile southward of West Pierhead Light.

Sodus Bay, N.Y., Sodus Point Station (43°16.4′ N., 76°58.5′ W.). On west side of harbor entrance. (Seasonal; no continuous radio guard.)

Rochester, N.Y. (43°15.4′ N., 77°36.2′ W.). East side of entrance to harbor.

Youngstown, N.Y., Niagara Station (43°15.7′ N., 79°03.8′ W.). East side of entrance to Niagara River.

Lake Erie:

Buffalo, N.Y., Coast Guard Base (42°52.6′ N., 78°53.2′ W.). On the south pier at the mouth of Buffalo River.

Erie, Pa. (42°09.2′ N., 80°04.7′ W.). On the north side of the entrance channel, near Erie Harbor Inner Range Rear Light.

Ashtabula, Ohio (41°54.1′ N., 80°47.9′ W.). On east side of river, about 700 feet north of the highway bridge.

Fairport, Ohio (41°45.6′ N., 81°16.9′ W.). On west side of mouth of Grand River.

Cleveland, Ohio (41°30.6′ N., 81°41.6′ W.). Near the west end of Burke Lakefront Airport on the south side of a small basin 1.1 miles east of East Breakwater Light.

Lorain, Ohio (41°28.2′ N., 82°10.7′ W.). East side of mouth of Black River.

Marblehead, Ohio (41°32.6′ N., 82°43.8′ W.). On Point Marblehead, 1.1 miles 297° from Marblehead Light.

Toledo, Ohio (41°41.6′ N., 83°28.4′ W.). In Bay View Park, on northwesterly side of the Maumee River near its mouth.

Detroit River:

Detroit, Mich., Belle Isle Station (42°20.4′ N., 82°57.7′ W.). At Belle Isle Light near the upper end of the island.

Lake St. Clair:

St. Clair Shores, Mich. (42°28.4′ N., 82°52.8′ W.). Near the end of Revere Avenue about 0.7 mile north of Miller Memorial Light.

Selfridge Air National Guard Base, Mich., Detroit Air Station (42°36.5′ N., 82°50.5′ W.). West of Anchor Bay, about 3.5 miles west-northwest of Clinton River entrance.

St. Clair River:

St. Clair Flats, Mich. (42°33.1′ N., 82°39.0′ W.). On northwesterly side of river at front light of St. Clair Flats Canal Range.

Port Huron, Mich. (43°00.3′ N., 82°25.3′ W.). On west side of entrance to St. Clair River, near Fort Gratiot Light.

Lake Huron:

Harbor Beach, Mich. (43°51.0′ N., 82°38.6′ W.). At the outer end of a causeway and trestle extending east from shore, about 0.7 mile west-northwest of Harbor Beach Light. (Seasonal; no continuous radio guard.)

Saginaw River, Mich. (43°38.1′ N., 83°51.0′ W.). On northwesterly side of entrance to Saginaw River.

East Tawas, Mich. (44°15.5′ N., 83°26.2′ W.). On Tawas Point, about 0.6 mile northeast of Tawas Light.

St. Ignace, Mich. (45°51.3′ N., 84°42.2′ W.). Near Michigan Department of State Highways dock on easterly end of Graham Point.

Lake Michigan:

Charlevoix, Mich. (45°19.0′ N., 85°14.7′ W.). North side of Pine River entrance to Lake Charlevoix.

Traverse City, Mich., Air Station (44°44.7′ N., 85°34.9′ W.). At southeasterly corporate limits of the city, about 2.5 miles southeast of Duncan L. Clinch Yacht Harbor.

Frankfort, Mich. (44°37.8′ N., 86°14.6′ W.). North side of entrance to harbor.

Manistee, Mich. (44°15.0′ N., 86°20.4′ W.). North side of entrance to Manistee Harbor. (Seasonal station.)

Ludington, Mich. (43°57.2′ N., 86°27.6′ W.). North side of entrance to harbor.

Muskegon, Mich. (43°13.7′ N., 86°20.3′ W.). South side of entrance to harbor.

Grand Haven, Mich. (43°03.6′ N., 86°14.8′ W.). North side of entrance to harbor.

Holland, Mich. (42°46.5′ N., 86°12.1′ W.). North side of harbor entrance.

South Haven, Mich. (42°24.1′ N., 86°17.0′ W.). South side of entrance to Black River. (Seasonal; no continuous radio guard.)

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St. Joseph, Mich. (42°06.8′ N., 86°29.1′ W.). North side of harbor entrance.

Michigan City, Ind. (41°43.4′ N., 86°56.4′ W.). East side of entrance to harbor.

Calumet Harbor, Ill. (41°43.0′ N., 87°31.6′ W.). Lake front in the southerly part of Calumet Park, about 1.1 miles south of Calumet River entrance.

Glenview, Ill., Chicago Air Station (42°05.2′ N., 87°49.7′ W.). About 7.5 miles west of Wilmette Harbor, Ill.

Wilmette, Ill. (42°04.6′ N., 87°41.0′ W.). North side of harbor entrance.

Kenosha, Wis. (42°35.4′ N., 87°49.0′ W.). On east side of the inner basin.

Milwaukee, Wis., Coast Guard Station, Group Office, and Base (43°00.1′ N., 87°53.2′ W.). At south end of outer harbor, about 0.8 mile southwest of South Entrance Light.

Sheboygan, Wis. (43°45.0′ N., 87°42.3′ W.). Near inner end of old north pier stub.

Two Rivers, Wis. (44°08.8′ N., 87°33.7′ W.). Northeast side of entrance to harbor.

Sturgeon Bay Canal, Wis. (44°47.7′ N., 87°18.7′ W.). At easterly entrance, on north side.

Plum Island, Wis. (45°18.8′ N., 86°57.0′ W.). On northerly side of Plum Island. (Seasonal station.)

Green Bay, Wis. (44°32.2′ N., 88°00.2′ W.). On the east side of the mouth of the Fox River. (Seasonal station.)

Escanaba, Mich., Aids to Navigation Team (45°44.7′ N., 87°02.7′ W.). On northern shore of Sand Point, about 2,000 feet southwest of Escanaba Light. (Limited search and rescue capabilities.)

St. Marys River:

Sault Ste. Marie, Mich., Coast Guard Station, Group Office, and Base (46°30.0′ N., 84°20.3′ W.). At Sault Ste. Marie, Mich., about 0.5 mile below the locks.

Lake Superior:

Grand Marais, Mich. (46°40.6′ N., 85°58.4′ W.). On west side of harbor entrance channel.

Munising, Mich. (46°24.9′ N., 86°39.7′ W.). In the town of Munising at the Munising Range Front Light. (Seasonal; no continuous radio guard.)

Marquette, Mich. (46°32.7′ N., 87°22.7′ W). Near inner end of breakwater, about 1,000 feet southwest of Marquette Light.

Keweenaw Waterway, Mich., Portage Station (47°13.5′ N., 88°37.4′ W.). On east bank of upper canal about 0.8 mile southeast of breakwater entrance.

Bayfield, Wis. (46°48.5′ N., 90°48.8′ W.). On south side of city, about 1,000 feet southwest of Bayfield Harbor South Breakwater Light.

Duluth, Minn. (46°46.3′ N., 92°05.4′ W.). On Minnesota Point, about 0.5 mile southerly from Duluth Ship Canal.

Grand Marais, Minn., North Superior Station (47°44.8′ N., 90°20.0′ W.). At southeast side of harbor, about 1,300 feet east-northeast of Grand Marais Light.

Lake Champlain:

Burlington, Vt. (44°28.8′ N., 73°13.5′ W.). 1,650 feet east of Burlington Harbor North Breakwater Light, on Battery Park.

Coast Guard Radio Broadcasts.—Urgent, safety, and scheduled marine information broadcasts are made by Coast Guard radio stations. In general, these broadcasts provide information vital to vessels operating in the approaches and coastal waters of the United States including the Great Lakes, Puerto Rico and U.S. Virgin Islands. Types of broadcasts are as follows:

Scheduled broadcasts.—U.S. Coast Guard radio stations make scheduled broadcasts on a prepublished schedule of intervals of 3 hours. After the preliminary announcement on VHF–FM channel 16 (156.80 MHz) the station advises shifting to working frequency: VHF–FM channel 22 (157.10 MHz).

Safety broadcasts.—U.S. Coast Guard stations which make scheduled broadcasts issue safety broadcasts upon receipt and on the next scheduled broadcast. Stations which do not make scheduled broadcasts issue safety broadcasts upon receipt and at intervals of 3 hours for 24 hours. Safety broadcasts are preceded by the safety signal SECURITE. After the preliminary signal on VHF–FM channel 16 (156.80 MHz), the station may announce shifting to working frequency: VHF–FM channel 22 (157.10 MHz).

Urgent broadcasts.—U.S. Coast Guard stations which make scheduled broadcasts issue urgent broadcasts upon receipt and on schedule until canceled. Stations which do not make scheduled broadcasts issue urgent broadcasts upon receipt and at intervals of 3 hours until canceled. Urgent broadcasts are preceded by the urgent signal, PAN. Both the urgent signal and message may be transmitted on VHF–FM channel 16 (156.80 MHz).

Times of broadcasts.—The following Coast Guard radio stations make broadcasts at the times indicated:

NMD–47, Buffalo Group, Buffalo (Lakes Ontario and Erie)

Scheduled—every 3 hours beginning at 0255 G.m.t.
Safety—upon receipt and next schedule.
Urgent—upon receipt, 15 minutes later and on schedule until canceled.

NOG, Sault Ste. Marie Group, Sault Ste. Marie (Lakes Huron, Michigan, and Superior)

Scheduled—every 3 hours beginning at 0005 G.m.t.
Safety—upon receipt and next schedule.
Urgent—upon receipt, 15 minutes later and on schedule until canceled.

NOG–14, Duluth Group, Duluth (W. Lake Superior)

Scheduled—every 3 hours beginning at 0135 G.m.t.
Safety—upon receipt and next schedule.
Urgent—upon receipt, 15 minutes later and on schedule until canceled.

NMD–35, Alexandria Bay Station, Alexandria Bay (St. Lawrence River)

Safety—upon receipt and repeated once at: 0235, 0535, 0835, 1135, 1435, 1735, 2035, 2335 G.m.t.
Urgent—upon receipt and at above times until canceled.

NMD–20, Detroit Group, Detroit (Lakes Erie, St. Clair, Huron; Detroit and St. Clair Rivers)

Safety—upon receipt and repeated once at: 0155, 0455, 0755, 1055, 1355, 1655, 1955, 2255 G.m.t.

Urgent—upon receipt and at above times until canceled.

NMD-32, Muskegon Group, Muskegon (Lake Michigan)

Safety—upon receipt and repeated once at: 0235, 0535, 0835, 1135, 1435, 1735, 2035, 2335 G.m.t.

Urgent—upon receipt and at above times until canceled.

NMP-9, Milwaukee Group, Milwaukee (Lake Michigan)

Safety—upon receipt and repeated once at: 0255, 0555, 0855, 1155, 1455, 1755, 2055, 2355 G.m.t.

Urgent—upon receipt and at above times until canceled.

Customs Ports of Entry

Boston Region

St. Albans District: St. Albans, Vt., Alburg, Vt., Burlington, Vt., Highgate Springs, Vt.

Ogdensburg District: Ogdensburg, N.Y., Alexandria Bay, N.Y., Cape Vincent, N.Y., Champlain-Rouses Point, N.Y., Clayton, N.Y., Massena, N.Y.

Custom Stations: Morristown, N.Y., Waddington, N.Y.

Buffalo District: Buffalo-Niagara Falls, N.Y., Oswego, N.Y., Rochester, N.Y., Sodus Point, N.Y.

Chicago Region

Duluth District: Duluth, Minn., Superior, Wis., Ashland, Wis., Grand Portage, Minn.

Milwaukee District: Milwaukee, Wis., Green Bay, Wis., Manitowoc, Wis., Marinette, Wis., Racine, Wis., Sheboygan, Wis.

Chicago District: Chicago, Ill.

Cleveland District: Cleveland, Ohio, Ashtabula, Ohio, Conneaut, Ohio, Erie, Pa., Sandusky, Ohio, Toledo, Ohio.

Customs Stations: Fairport, Ohio, Huron, Ohio, Lorain, Ohio, Marblehead-Lakeside, Ohio, Put-in-Bay, Ohio.

Detroit District: Detroit, Mich., Muskegon, Mich., Port Huron, Mich., Saginaw-Bay City, Mich., Sault Ste. Marie, Mich.

Customs Stations: Algonac, Mich., Alpena, Mich., De-Tour, Mich., Escanaba, Mich., Grand Haven, Mich., Houghton, Mich., Marine City, Mich., Marquette, Mich., Rogers City, Mich.

Foreign-Trade Zones

Foreign-Trade Zone No. 8, 3332 St. Lawrence Drive, Toledo, Ohio 43605.

Foreign-Trade Zone No. 10, 203 15th Street, Bay City, Mich. 48706.

Foreign-Trade Zone No. 16, Sault Industrial Park, Sault Ste. Marie, Mich. 49783.

Foreign-Trade Zone No. 22, Chicago Regional Port District, Butler Drive, Lake Calumet Harbor, Chicago, Ill. 60633.

Foreign-Trade Zone No 23, 901 Fuhrmann Boulevard, Buffalo, N.Y. 14203.

National Weather Service Offices.—The following offices will provide forecasts and climatological data or arrange to obtain these services from other offices. They will also check barometers in their offices or by telephone; refer to the local telephone directory for numbers.

Alpena, Mich.: Phelps Collins Airport, Route 2, 49707.

Buffalo, N.Y.: Greater Buffalo International Airport, East Terminal 14225.

Burlington, Vt.: International Airport 05401.

Chicago, Ill.: Midway Airport, 6200 South Cicero Avenue 60638; O'Hare International Airport, P.O. Box 66129, 60666; O'Hare Office Bldg. #2, Room 610, 10600 West Higgins Road, Rosemont, Ill. 60018.

Cleveland, Ohio: Cleveland Hopkins International Airport, Federal Facilities Bldg. 44135.

Detroit, Mich.: Metropolitan Airport, Bldg. 348, 48242.

Duluth, Minn.: International Airport 55811.

Erie, Pa.: International Airport 16505.

Green Bay, Wis.: Route 17, Austin Straubel Field 54303.

Marquette, Mich.: Box 669, 49855.

Milwaukee, Wis.: 5300 South Howell Avenue 53207.

Muskegon, Mich.: Muskegon County Airport, 99 Sinclair Drive 49441.

Rochester, N.Y.: Monroe County Airport 14624.

Sault Ste. Marie, Mich.: City-County Airport 49783.

Toledo, Ohio: Toledo Express Airport, R.F.D. 4, Swanton, Ohio 43558.

Radio Weather Broadcasts.—Taped or direct broadcasts of forecasts and storm warnings are made by commercial and Coast Guard radio stations in the area covered by this Coast Pilot. These broadcasts are usually made several times a day. Transmission schedules are shown on the Marine Weather Services Charts for the following areas:

Great Lakes: Michigan and Superior.

Great Lakes: Huron, Erie and Ontario.

These charts are for sale by the National Ocean Survey, Distribution Division (C44), 6501 Lafayette Avenue, Riverdale, Md. 20840, and its authorized sales agents.

The weather broadcasts schedules of Coast Guard radio stations are also listed in the description of Coast Guard marine services found elsewhere in this appendix.

VHF-FM Weather Broadcasts.—National Weather Service VHF-FM radio stations provide mariners with continuous FM broadcasts of weather warnings, forecasts, radar reports, and surface weather observations. These stations usually transmit on 162.55 or 162.40 MHz. Reception range is up to 40 miles from the antenna site, depending on the terrain, type of receiver, and antenna used. The following VHF-FM radio stations with location of antenna are in or near the area covered by this Coast Pilot.

KIG-60, Burlington, Vt., 162.40 MHz (44°32′ N., 72°49′ W.)

KHA-53, Rochester, N.Y., 162.40 MHz (43°08′ N., 77°35′ W.)

KEB-98, Buffalo, N.Y., 162.55 MHz (42°57′ N., 78°53′ W.)

KEC-58, Erie, Pa., 162.40 MHz (42°05′ N., 80°11′ W.)

KHB-59, Cleveland, Ohio, 162.55 MHz (41°24′ N., 81°51′ W.)

KDO-94, Akron, Ohio, 162.40 MHz (41°04′ N., 81°35′ W.)

KHB-97, Sandusky, Ohio, 162.40 MHz (41°24′ N., 82°49′ W.)

KEC–63, Detroit, Mich., 162.55 MHz (42°24′ N., 83°00′ W.)

KIH–29, Clio, Mich., 162.40 MHz (43°13′ N., 83°43′ W.)

KIG–83, Alpena, Mich., 162.55 MHz (45°04′ N., 83°43′ W.)

KIH–22, Traverse City, Mich., 162.40 MHz (44°46′ N., 85°41′ W.)

KWO–39, Chicago, Ill., 162.55 MHz (41°53′ N., 87°38′ W.)

KIG–63, Grand Rapids, Mich., 162.55 MHz (42°53′ N., 85°36′ W.)

KEC–60, Milwaukee, Wis., 162.40 MHz (42°57′ N., 87°54′ W.)

KIG–65, Green Bay, Wis., 162.55 MHz (44°29′ N., 88°03′ W.)

KIG–74, Sault Ste. Marie, Mich., 162.55 MHz (46°29′ N., 84°22′ W.)

KIG–66, Marquette, Mich., 162.55 MHz (46°33′ N., 87°23′ W.)

KIG–64, Duluth, Minn., 162.55 MHz (46°50′ N., 92°11′ W.)

Public Health Service Quarantine Stations.—Stations where quarantine examinations are performed:

Chicago, Ill.: Chicago Quarantine Station, P.O. Box 66012, 60666.

At other ports, quarantine and/or medical examinations are usually performed by Public Health Service contract personnel or by quarantine inspectors from the nearest quarantine station. Inquiries concerning quarantine matters should be directed to the nearest quarantine station.

Public Health Service Outpatient Clinics

Buffalo, N.Y.: 50 High Street 14203.

Chicago, Ill.: 1439 South Michigan Avenue 60605.

Cleveland, Ohio: New Post Office Building, West Third Street and Prospect Avenue 44113.

Detroit, Mich.: 14700 Riverside Drive 48215.

Public Health Service Contract Physicians

Many Public Health Service facilities have contracted with private physicians in order that these physicians may provide necessary medical care to eligible Public Health Service beneficiaries. These Contract Physicians are generally in geographic areas where there are no Public Health Service medical facilities.

Persons requiring medical care in areas where there are no Public Health Service hospitals or outpatient clinics nearby should check the local telephone directory under "U.S. Government, Department of Health, Education, and Welfare" to determine whether a local physician may be listed as a Public Health Service Contract Physician. In addition, similar information may be obtained by calling or writing to the nearest Public Health Service facility.

Food and Drug Administration (FDA) Offices

New York State (Northern part):
599 Delaware Avenue
Buffalo, N.Y. 14202.

Illinois:
433 West Van Buren Street
Chicago, Ill. 60607.

Ohio:
1141 Central Parkway
Cincinnati, Ohio 45202.

Michigan, Indiana:
1560 E. Jefferson Avenue
Detroit, Mich. 48207.

Minnesota, Wisconsin:
240 Hennepin Avenue
Minneapolis, Minn. 55401.

Department of Agriculture, Animal and Plant Health Inspection Service (APHIS) Offices.—Listed below are ports covered by this volume where APHIS inspectors are available to inspect plants, foods, and plant and animal products, and locations of Animal Import Centers where livestock and birds are inspected.

For information on importing plants, foods, and plant and animal products, contact Plant Protection and Quarantine Programs, APHIS, Department of Agriculture, Federal Bldg., Room 635, Hyattsville, Md. 20782. Telephone: 301–436–8247.

For information and arrangements to import live ruminants, swine, equines, and poultry and other birds, contact Veterinary Services, APHIS, Department of Agriculture, Federal Bldg., Room 818, Hyattsville, Md. 20782. Telephone: 301–436–8170.

New York:

Rouses Point: St. John's Highway Border Station, Room 118, Route 9–B, 12979.

Buffalo: Federal Building, Room 1113, 111 W. Huron Street 14202.

Ohio:

Cleveland: Federal Building, Room 1749, 1240 E. 9th Street 44199.

Toledo: U.S. Courthouse and Customhouse, Room 119, 1732 Spielbusch Avenue 43624.

Michigan:

Detroit: Federal Building, Room 924, 231 W. Lafayette Street 48226.

Illinois:

Chicago: U.S. Custom House, Room 800, 610 S. Canal Street 60607.

Wisconsin:

Milwaukee: International Arrivals Terminal, General Mitchell Field 53207.

Minnesota:

Duluth: Board of Trade Bldg., Room 420, 301 W. First Street 55802.

Animal Import Centers:

Clifton, N.J.: 878 Clifton Avenue 07013.

Honolulu, Hawaii: 1311 Kapiolani Boulevard, Room 607, 96814.

Miami, Fla.: P.O. Box 1054 (Miami International Airport) 33148.

Immigration and Naturalization Service Offices

Illinois:

Chicago: Dirksen Federal Office Bldg., 219 South Dearborn Street 60604.

Michigan:

Algonac: 202 Fruit Street 48001.

Detroit: Federal Bldg., 333 Mt. Elliott Street 48207.

Marine City: 451 South Water Street 48039.

Muskegon: International Terminal 49440.

Port Huron: Pinegrove and Elmwood Streets 48060.

Sault Ste. Marie: International Bridge Plaza 49783.

Trenton: 23100 West Road 48183.

Minnesota:

Duluth: U.S. Courthouse and Customhouse, 515 West First Street 55802.

Grand Marais: P.O. Box 685, 55604.

Grand Portage: 55605.

New York:

Alexandria Bay: Heart Island off Alexandria Bay 13607.

Buffalo: 68 Court Street 14202.

Cape Vincent: Horne's Ferry Service 13618.

Clayton: Riverside Drive 13624.

Lewiston: P.O. Box 305, 14092.

Massena: P.O. Box 699, 13662.

Niagara Falls: Rainbow Bridge 14303.

Ogdensburg: Ogdensburg-Prescott Bridge 13669.

Rochester: 410 Old Post Office Bldg. 14614.

Rouses Point: Route 276, 12979.

Youngstown: 14301.

Ohio:

Ashtabula: Marine Bank Bldg., 325 Hulbert Avenue 44004.

Cleveland: Anthony J. Celebrezze Federal Bldg., 1240 East 9th Street 44199.

Sandusky: Post Office Bldg. 44870.

Toledo: Federal Office Bldg., 234 Summit Street 43604.

Vermont:

Alburg: State Route 68, 05440.

Burlington: Federal Bldg. 05401.

Wisconsin:

Milwaukee: Federal Bldg., 517 East Wisconsin Avenue 53202.

Federal Communications Commission Offices

District Field Offices:

Buffalo, N.Y.: Federal Bldg., 111 West Huron Street 14202.

Canandaigua, N.Y.: P.O. Box 374, 14424.

Chicago, Ill.: 230 S. Dearborn Street 60604.

Detroit, Mich.: Federal Bldg., 231 W. Lafayette Street 48226.

St. Paul, Minn.: Federal Bldg., 316 North Robert Street 55101.

Saint Lawrence Seaway Development Corporation Offices

Saint Lawrence Seaway Development Corporation, 800 Independence Avenue SW., Washington, D.C. 20591.

Saint Lawrence Seaway Development Corporation, Box 520, Massena, N.Y. 13662.

Canadian Government Agencies

Dominion Hydrographer, Canadian Hydrographic Service, Department of Fisheries and the Environment, Ottawa, Ontario K1A OE6, Canada.

Hydrographic Chart Distribution Office, Department of Fisheries and the Environment, P.O. Box 8090, 1675 Russell Road, Ottawa, Ontario K1G 3H6, Canada.

Atmospheric Environment Service, Department of Fisheries and the Environment, 4905 Dufferin Street, Downsview, Ontario M3H 5T4, Canada.

Ocean and Aquatic Sciences, Department of Fisheries and the Environment, P.O. Box 5050, Burlington, Ontario L7R 4A6, Canada.

Canadian Hydrographic Service, Department of Fisheries and the Environment, Ottawa, Ontario K1A 0E6, Canada.

Director, Aids and Waterways, Canadian Coast Guard, Transport Canada, Ottawa, Ontario K1A 0N7, Canada.

Canadian Coast Guard, Transport Canada, 1 Yonge Street, Toronto, Ontario M5E 1E5, Canada.

Canadian Customs Offices

Director, Headquarters Operations, Department of National Revenue, Customs and Excise, 191 Laurier Street W., Ottawa, Ontario K1A 0L5, Canada.

Ottawa Region: 52 Nicholas Street, Ottawa, Ontario K1N 7B8, Canada. Telephone 613–992–2295.

Hamilton Region: 10 John Street S., P.O. Box 989, Hamilton, Ontario L8N 3V8, Canada. Telephone 416–523–2812.

London Region: 111 Waterloo Street, P.O. Box 5940, Terminal "A", London, Ontario N6A 4T9, Canada. Telephone 519–679–4131.

Toronto Region: 1 Front Street W., P.O. Box 10, Station A, Toronto, Ontario M5W 1A3, Canada. Telephone 416–369–4515.

Windsor Region: 185 Ouellette, Windsor, Ontario N9A 4H8, Canada. Telephone 519–254–9202, Extension 238.

Winnipeg Region: Federal Bldg., 269 Main Street, Winnipeg, Manitoba R3C 1B3, Canada. Telephone 204–985–3064.

St. Lawrence Seaway Authority (Canada) Offices

The St. Lawrence Seaway Authority, Transport Canada Bldg., Place de Ville, Tower A, 320 Queen Street, Ottawa, Ontario K1R 5A3, Canada.

The St. Lawrence Seaway Authority, 202 Pitt Street, Cornwall, Ontario K6J 3P7, Canada.

The St. Lawrence Seaway Authority, P.O. Box 370, St. Catharines, Ontario L2R 6V8, Canada.

The St. Lawrence Seaway Authority, P.O. Box 97, Administration Bldg., St. Lambert Lock, St. Lambert, P. Q. J4P 3N7, Canada.

Table 33--*DISTANCES BETWEEN POINTS ON GREAT LAKES (statute miles)*

		36 Montreal	35 Ogdensburg	34 Kingston	33 Toronto	32 Oswego	31 Rochester	30 Port Colborne	29 Buffalo	28 Erie	27 Conneaut	26 Ashtabula	25 Fairport	24 Cleveland	23 Lorain	22 Toledo	21 Detroit	20 Port Huron	19 Midland	18 Collingwood	17 Goderich	16 Bay City	15 Alpena	14 Ludington	13 Muskegon	12 Gary	11 Chicago	10 Milwaukee	9 Green Bay	8 Escanaba	7 Sault Ste. Marie	6 Marquette	5 Houghton	4 Ashland	3 Duluth	2 Two Harbors
1	Thunder Bay (Port Arthur), Canada	1222	1096	1034	903	1016	965	848	864	795	768	754	729	711	694	658	604	542	539	531	506	505	410	536	587	699	686	621	560	492	273	171	116	164	195	172
2	Two Harbors, Minn.	1320	1194	1132	1001	1114	1063	946	963	893	866	852	828	809	792	756	702	640	638	630	604	603	508	634	685	797	785	720	659	590	371	239	157	71	26	
3	Duluth, Minn.	1344	1218	1156	1025	1138	1087	970	986	917	890	876	851	833	816	781	726	664	661	653	628	627	532	657	709	820	808	743	682	614	394	261	179	[illegible]		
4	Ashland, Wis.	1298	1172	1110	979	1092	1041	924	941	871	844	830	806	788	771	734	680	618	616	608	583	581	486	612	663	775	763	698	637	568	349	213	131			
5	Houghton, Mich.	1170	1044	982	851	964	913	796	813	743	716	702	678	659	643	606	552	490	488	480	455	453	358	484	535	647	635	570	509	440	221	84				
6	Marquette, Mich.	1109	983	921	790	903	852	735	751	682	655	641	616	598	581	545	491	429	426	418	393	391	297	422	474	585	573	508	447	378	159					
7	Sault Ste. Marie, Mich. (a)	949	823	761	630	743	692	575	592	522	495	481	457	438	422	385	331	269	267	259	234	232	137	263	314	426	414	349	288	219						
8	Escanaba, Mich.	1056	930	868	737	850	799	682	699	629	602	588	564	545	528	492	438	376	384	376	340	339	244	130	181	288	274	201	101							
9	Green Bay, Wis.	1125	999	937	806	919	868	751	767	698	671	657	632	614	597	561	507	445	452	444	409	407	313	123	171	272	255	180								
10	Milwaukee, Wis.	1186	1060	998	867	980	929	812	828	759	732	718	693	675	658	622	568	506	513	505	470	468	374	97	80	103	85									
11	Chicago, Ill.	1251	1125	1063	932	1045	994	877	893	824	797	783	758	740	723	688	633	571	578	570	535	534	439	156	114	25										
12	Gary, Ind.	1263	1137	1075	944	1057	1006	889	905	836	809	795	770	752	735	699	645	583	590	582	547	546	451	167	121											
13	Muskegon, Mich.	1151	1025	963	832	945	894	777	794	724	697	683	659	640	623	587	533	471	479	471	435	434	339	56												
14	Ludington, Mich.	1100	974	912	781	894	843	726	742	673	646	632	607	589	572	536	482	420	427	419	384	383	288													
15	Alpena, Mich.	837	711	649	518	631	580	463	479	410	383	369	344	326	309	273	219	157	193	185	124	116														
16	Bay City, Mich.	842	716	654	523	636	585	468	484	415	388	374	349	331	314	278	224	162	265	257	137															
17	Goderich, Canada	745	619	557	426	539	488	371	387	318	291	277	252	234	217	181	127	65	211	207																
18	Collingwood, Canada	938	812	750	619	732	681	564	580	511	484	470	446	427	410	374	320	258	55																	
19	Midland, Canada	946	820	758	627	740	689	572	588	519	492	478	453	435	418	382	328	266																		
20	Port Huron, Mich. (b)	680	554	492	361	474	423	306	322	253	226	213	188	170	152	116	62																			
21	Detroit, Mich. (Woodward Ave.)	618	492	430	299	412	361	244	261	191	184	150	126	108	91	54																				
22	Toledo, Ohio (river mouth)	611	485	423	292	405	354	237	254	185	157	144	119	96	72																					
23	Lorain, Ohio	554	428	366	235	348	297	180	197	124	95	80	53	28																						
24	Cleveland, Ohio (main entrance)	534	408	346	215	328	277	160	176	102	73	59	33																							
25	Fairport, Ohio	504	378	316	185	298	247	130	146	73	44	30																								
26	Ashtabula, Ohio	478	352	290	159	272	221	104	119	45	15																									
27	Conneaut, Ohio	466	340	278	147	260	209	92	107	33																										
28	Erie, Pa.	439	313	251	120	233	182	65	78																											
29	Buffalo, N.Y. (north entrance)	396	270	208	77	190	139	22																												
30	Port Colborne, Canada	374	248	186	55	168	117																													
31	Rochester, N.Y.	275	149	89	95	59																														
32	Oswego, N.Y.	234	108	55	145																															
33	Toronto, Canada	349	223	161																																
34	Kingston, Canada	189	63																																	
35	Ogdensburg, N.Y.	126																																		
36	Montreal, Canada (c)	0																																		

(a) From abreast east end of U.S. center pier.
(b) From foot of Grand River Ave.
(c) From intersection Seaway-Ship Channel, Montreal Harbour.

EXPLANATION

Distances in these tables are expressed to the nearest even statute mile; *fractions of 1/2 mile or more* being taken as a full mile and those under the half dropped. The results are, therefore, at times inconsistent by 1 mile in their comparative differences. Thus, measured distances to two given points may differ uniformly by 0.8 mile; if the respective distances to the two points from a certain port measure 116.0 and 115.2, they appear in the table as 116 and 115, a difference of 1 mile; whereas from the next port listed, the distance to the same two points may measure 105.4 and 104.6, and both will appear in the table as 105.

Measurements are by the shortest marked or safe direct courses, starting (unless *otherwise noted*) *from the main* entrance between pierheads of breakwaters or piers, or from the principal landings of open roadsteads. Where landings are appreciably remote from protected entrances, the appropriate further distances, if desired, may be ascertained from the harbor descriptions or from charts.

Points in this table are arranged in the order of their location *on the several* lakes in the following sequence; Lake Ontario, Lake Erie, Lake Huron, Lake Michigan, and Lake Superior.

The distance between any two points appears in the line extending horizontally from the point first in order in the list and in the column headed by the other point.

Table 34--DISTANCES BETWEEN POINTS ON LAKE ONTARIO AND ST. LAWRENCE RIVER (statute miles)

Other tables to which initial points Nos. 1-3 are common:
35 - Lake Erie, St. Clair, Detroit, and Niagara Rivers.
36 - Lake Huron and St. Marys River.
37 - Lake Michigan.
38 - Lake Superior.

		36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3
		Quebec	St. Lambert Lock	Cote Ste. Catherine Lock	Beauharnois Lock	Colquhoun Island	Snell Lock	Eisenhower Lock	Iroquois Lock	Ogdensburg	Brockville	Alexandria Bay	Thousand Island Park	Clayton	Gananoque	Kingston	Picton	Deseronto	Belleville	Trenton	Cobourg	Port Hope	Toronto	Hamilton	Port Weller	Lewiston	Niagara-on-the-Lake	Olcott	Rochester	Sodus Bay	Little Sodus Bay	Oswego	Sacketts Harbor	Cape Vincent	Port Colborne
1	OLD MACKINAC POINT (35, 36, 37, 38)[a]	1084	922	914	892	848	841	837	812	799	787	766	760	755	758	739	726	713	697	688	653	648	608	610	580	598	592	608	670	698	712	721	745	740	553
2	PORT HURON (35, 36, 38)[b]	837	675	667	645	601	594	590	565	552	540	519	513	508	511	492	479	466	450	441	406	401	361	363	333	351	345	361	423	451	465	474	498	493	306
3	PORT COLBORNE (35, 38)	531	369	361	339	295	288	284	259	246	234	213	207	202	205	186	173	160	144	135	100	95	55	57	27	45	39	55	117	145	159	168	192	187	
4	Cape Vincent, N.Y.	344	183	175	153	109	102	98	73	60	48	27	20	16	19	24	45	51	67	78	101	106	160	186	160	160	154	134	89	69	59	49	26		
5	Sacketts Harbor, N.Y.	370	209	201	179	135	128	124	99	86	74	53	46	42	45	36	56	61	78	88	106	112	165	191	165	164	158	138	88	64	52	41			
6	Oswego, N.Y.	391	232	224	202	158	151	147	122	108	97	76	69	65	68	55	66	71	88	82	91	96	145	166	141	139	133	113	59	29	15				
7	Little Sodus Bay, N.Y.	401	241	233	211	167	160	156	131	118	106	85	78	74	77	64	73	78	88	79	85	90	136	157	131	130	124	104	48	18					
8	Sodus Bay, N.Y.	411	251	243	221	177	170	166	141	128	116	95	88	84	87	72	80	86	83	74	77	81	124	145	118	118	112	92	35						
9	Rochester, N.Y. (Charlotte)	432	271	263	241	197	190	186	161	149	136	115	108	104	107	90	98	89	73	64	57	60	96	117	89	89	83	63							
10	Olcott, N.Y.	478	316	308	286	242	235	231	206	193	181	160	153	149	152	134	121	109	92	83	51	47	38	55	28	28	22								
11	Niagara-on-the Lake, Canada	500	336	328	306	262	255	251	226	213	201	180	173	169	172	154	141	128	111	102	66	63	30	39	11	6									
12	Lewiston, N.Y.	506	342	334	312	268	261	257	232	219	207	186	179	175	178	160	147	134	117	108	72	69	36	45	17										
13	Port Weller, N.Y.	504	342	334	312	268	261	257	232	219	207	186	179	175	178	159	146	133	117	107	72	68	28	30											
14	Hamilton, Canada	530	367	359	337	293	286	282	257	244	232	211	205	200	204	185	169	156	140	131	94	88	30												
15	Toronto, Canada (west entrance)	506	342	334	312	268	261	257	232	219	207	186	180	175	179	160	142	129	112	103	65	60													
16	Port Hope, Canada	449	289	281	259	215	208	204	179	166	154	132	126	121	125	106	85	72	56	47	7														
17	Coburg, Canada	444	283	275	253	209	202	198	173	160	148	127	120	116	120	101	79	67	50	41															
18	Trenton, Canada	417	255	247	225	181	174	170	145	132	120	101	94	90	89	71	40	28	11																
19	Belleville, Canada	406	244	236	214	170	163	159	134	121	109	90	84	80	78	60	29	17																	
20	Deseronto, Canada	390	228	220	198	154	147	143	118	105	93	74	68	63	62	44	13																		
21	Picton, Canada	383	222	214	192	148	141	137	112	99	87	68	62	57	56	37																			
22	Kingston, Canada	346	185	177	155	111	104	100	75	62	50	32	25	21	19																				
23	Gananoque, Canada	327	167	159	137	93	86	82	57	44	32	18	11	10																					
24	Clayton, N.Y.	327	167	159	137	93	86	82	57	44	32	11	4																						
25	Thousand Island Park, N.Y.	326	164	156	134	90	83	79	54	41	29	8																							
26	Alexandria Bay, N.Y.	317	156	148	127	83	76	72	46	33	22																								
27	Brockville, Canada	295	135	127	105	61	54	50	25	12																									
28	Ogdensburg, N.Y.	283	123	115	93	49	42	38	13																										
29	Iroquois Lock, Canada	270	110	102	80	36	29	25																											
30	Eisenhower Lock, N.Y.	245	85	77	55	11	4																												
31	Snell Lock, N.Y.	241	81	73	51	7																													
32	Colquhoun Island, Canada	233	74	66	44																														
33	Beauharnois Lock, Canada	190	30	22																															
34	Cote Ste. Catherine Lock, Canada	169	8																																
35	St. Lambert Lock, Canada	160																																	
36	Quebec, Canada	0																																	

(a) From sailing course point north of Old Mackinac Point.
(b) From foot of Grand River Ave. To Toronto west entrance.

EXPLANATION

Explanation generally applicable to all tables is published in Table 33.

Points in this table are arranged in geographical sequence proceeding westward along the south shore *and returning* eastward along the north shore of the lake and down St. Lawrence River.

For determining distances to points located in other lakes, distances from all places listed in this table are given to the initial points *Nos. 1 to 3, which* also appear in the other tables respectively indicated by numeral designation. The through distance from a given point in this table to a given point in any other table is the sum of the respective distances to each given point from the initial point which is common to the two tables. Thus, Port Colborne being the common point for determining distances from Lake Ontario and St. Lawrence River points to points in Lake Superior (Table 38), a through distance would be derived as follows:

Port Colborne to Colquhoun Island	295
Port Colborne to Thunder Bay (Ft. William)	847
Colquhoun Island to Thunder Bay (Ft. William)	1,142

Table 35--DISTANCES BETWEEN POINTS ON LAKE ERIE AND ST. CLAIR, DETROIT, AND NIAGARA RIVERS (statute miles)

Other tables to which initial points Nos. 1-3 are common:
34 - Lake Ontario and St. Lawrence River.
36 - Lake Huron and St. Marys River.
37 - Lake Michigan.
38 - Lake Superior.

		37 Kingsville	36 Rondeau	35 Port Stanley	34 Port Burwell	33 Port Dover	32 Port Maitland	31 Niagara Falls	30 Tonawanda	29 Buffalo	28 Dunkirk	27 Erie	26 Conneaut	25 Ashtabula	24 Fairport	23 Cleveland	22 Lorain	21 Vermilion	20 Huron	19 Sandusky	18 Put-in-Bay	17 Port Clinton	16 Toledo	15 Monroe	14 Detroit River Light	13 Amherstburg	12 Trenton	11 Wyandotte	10 Detroit	9 Chatham	8 Mt. Clemens	7 St. Clair Flats	6 Algonac	5 Marine City	4 St. Clair	3 Port Huron	2 Port Colborne
1	OLD MACKINAC POINT (34, 36, 37, 38)[a]	358	414	459	475	527	538	588	580	569	539	500	473	460	435	417	399	391	387	380	363	369	363	348	334	326	324	320	309	322	296	286	274	266	259	247	553
2	PORT COLBORNE (34, 38)	201	146	109	89	52	18	41	33	22	25	65	92	104	130	160	180	190	198	204	204	213	237	227	219	227	229	234	244	292	278	267	281	287	294	306	
3	PORT HURON (34, 36, 38)[b]	111	167	212	228	280	291	341	333	322	292	253	226	213	188	170	152	144	140	133	116	122	116	101	87	79	77	73	62	75	49	39	27	19	12		
4	St. Clair, Mich.	99	155	200	216	268	279	330	322	311	281	241	214	201	176	158	141	133	129	122	105	111	105	89	75	67	65	61	50	63	37	27	15	7			
5	Marine City, Mich.	92	148	193	209	261	272	322	314	303	273	234	207	194	169	151	133	125	121	114	97	103	97	82	68	60	58	54	43	56	30	20	7				
6	Algonac, Mich.	86	143	188	203	255	267	317	309	298	268	228	201	188	163	145	128	120	116	109	92	98	92	76	62	55	53	48	37	49	22	14					
7	St. Clair Flats, Mich., Canada[c]	72	129	174	189	241	253	303	295	284	254	215	187	174	149	131	114	106	102	95	78	84	78	62	48	41	39	34	23	35	15						
8	Mt. Clemens, Mich.	83	140	185	200	252	264	314	306	295	265	226	199	185	161	142	125	117	113	106	89	95	89	73	59	53	50	45	35	49							
9	Chatham, Canada	97	154	199	214	265	278	328	320	309	279	239	212	198	174	156	139	130	127	120	102	108	102	87	73	66	63	59	48								
10	Detroit, Mich. (Woodward Ave.)	49	106	151	166	217	230	280	272	261	231	191	164	150	126	108	91	82	79	72	54	60	54	39	25	18	15	11									
11	Wyandotte, Mich.	39	96	141	156	208	220	270	262	251	221	182	154	141	116	98	81	73	69	62	45	51	45	29	15	8	5										
12	Trenton, Mich.	34	91	136	151	203	215	265	257	246	216	177	149	136	111	93	76	68	64	57	40	46	40	24	10	13											
13	Amherstburg, Canada	31	88	133	148	200	212	262	254	243	213	173	146	133	108	90	73	64	61	54	36	42	36	21	7												
14	Detroit River Light, Mich.	24	81	126	141	193	205	255	247	236	206	166	139	126	101	83	66	58	54	47	30	36	30	14													
15	Monroe, Mich. (piers)	33	89	134	149	200	213	263	255	244	214	174	147	133	109	89	68	60	54	48	30	35	21														
16	Toledo, Ohio (river mouth)	45	98	143	159	210	223	272	265	254	224	185	157	144	119	96	72	65	59	52	38	40															
17	Port Clinton, Ohio	37	75	120	136	187	199	249	241	230	200	160	131	118	92	67	43	36	29	22	12																
18	Put-in-Bay, Ohio	27	66	111	127	177	190	240	232	221	190	150	122	109	83	61	38	32	27	21																	
19	Sandusky, Ohio (wharves)	41	69	114	130	178	190	239	232	221	189	149	120	107	79	55	29	21	14																		
20	Huron, Ohio	47	68	111	124	172	184	233	226	215	183	142	113	99	72	47	20	11																			
21	Vermilion, Ohio	46	62	104	117	163	175	225	217	206	174	133	104	90	63	37	11																				
22	Lorain, Ohio	48	57	97	109	154	166	215	208	197	164	124	95	80	53	28																					
23	Cleveland, Ohio (main entrance)	65	53	85	93	134	146	194	187	176	143	102	73	59	33																						
24	Fairport, Ohio	83	48	62	66	104	116	165	157	146	114	73	44	30																							
25	Ashtabula, Ohio	108	63	56	47	79	90	138	130	119	86	45	15																								
26	Conneaut, Ohio	122	74	59	48	68	80	126	118	107	74	33																									
27	Erie, Pa.	149	98	70	53	47	54	98	89	78	45																										
28	Dunkirk, N.Y.	188	134	98	78	50	28	55	48	37																											
29	Buffalo, N.Y.	218	163	126	106	72	38	21	13																												
30	Tonawanda, N.Y.	230	174	137	117	83	49	8																													
31	Niagara Falls, N.Y.	237	182	145	125	90	57																														
32	Port Maitland, Canada	187	132	95	75	37																															
33	Port Dover, Canada	175	120	83	62																																
34	Port Burwell, Canada	123	65	23																																	
35	Port Stanley, Canada	108	49																																		
36	Rondeau, Canada	63																																			
37	Kingsville, Canada	0																																			

(a) From sailing course point north of Old Mackinac Point.
(b) From foot of Grand River Ave.
(c) From south end of canal dike.

EXPLANATION

Explanation generally applicable to all tables is published in Table 33.

Points in this table are arranged in geographical sequence proceeding southward in St. Clair River and Lake and Detroit River, eastward along the south shore of Lake Erie to Niagara River, and returning westward along the north lake shore.

For determining distances to points located in other lakes, distances from all places listed in this table are given to the initial points Nos. 1 to 3, which also appear in the other tables respectively indicated by numeral designation. The through distance from a given point in this table to a given point in any other table is the sum of the respective distances to each given point from the initial point which is common to the two tables. Thus, Old Mackinac Point being the common point for determining distances from Lake Erie to points in Lake Michigan (Table 37), a through distance would be derived as follows:

Old Mackinac Point to Tonawanda	580
Old Mackinac Point to Sheboygan	212
Tonawanda to Sheboygan	792

Table 36--DISTANCES BETWEEN POINTS ON LAKE HURON AND ST. MARYS RIVER (statute miles)

Other tables to which initial points Nos. 1-3 are common:
34 - Lake Ontario and St. Lawrence River.
35 - Lake Erie, St. Clair, Detroit, and Niagara Rivers.
37 - Lake Michigan.
38 - Lake Superior.

		38 Thessalon	37 Algoma Mills	36 Gore Bay	35 Little Current	34 Killarney	33 French River	32 Key Harbor	31 Byng Inlet	30 Parry Sound	29 Depot Harbor	28 Victoria Harbor	27 Midland	26 Penetanguishene	25 Collingwood	24 Meaford	23 Owen Sound	22 Wiarton	21 Southampton	20 Kincardine	19 Goderich	18 Port Sanilac	17 Harbor Beach	16 Saginaw	15 Bay City	14 East Tawas	13 Au Sable	12 Alpena	11 Rockport	10 Stoneport	9 Rogers City	8 Cheboygan	7 Mackinac Island	6 St. Ignace	5 Port Dolomite	4 De Tour	3 Sault Ste. Marie	2 Old Mackinac Point
1	PORT HURON (34, 35, 38)(a)	*238	+238	+250	225	213	224	232	229	247	243	267	266	265	258	241	238	228	121	94	65	33	63	175	162	119	117	157	166	182	194	233	243	247	239	224	269	247
2	OLD MACKINAC POINT (34, 35, 37, 38)(b)	69	*101	*116	*143	*167	*196	*205	*211	235	231	256	255	254	247	230	227	217	189	192	211	215	186	223	210	163	142	115	93	78	54	18	7	6	27	45	90	
3	SAULT STE. MARIE (38)(c)	&48	&88	&106	&131	&155	&184	&193	&201	&242	+238	268	267	266	259	242	239	229	207	213	234	238	208	246	232	185	165	137	107	96	84	84	84	90	68	45		
4	DeTour, Mich.	%24	%58	%76	%101	%125	%154	%163	%171	201	198	224	222	221	214	197	194	185	162	168	189	193	164	201	187	140	120	92	61	51	40	39	39	44	23			
5	Port Dolomite, Mich.	+92	+90	+108	+135	189	197	199	198	218	215	243	241	238	233	220	219	207	176	183	203	218	190	219	206	163	143	113	76	70	47	31	26	28				
6	St. Ignace, Mich.	%68	*100	*115	*142	*166	*195	*204	*209	234	231	256	254	252	246	229	227	217	191	194	214	216	187	224	210	163	143	115	83	82	55	20	6					
7	Mackinac Island, Mich.	%63	*95	*110	*137	*161	*190	*199	*204	229	226	251	249	248	241	224	221	212	186	189	209	212	184	220	207	159	140	111	79	77	50	17						
8	Cheboygan, Mich.	%63	*92	*106	*133	*157	*186	*195	*197	221	217	242	241	240	233	216	213	204	175	178	198	202	173	210	196	149	129	101	69	66	40							
9	Rogers City, Mich.	*63	+74	+87	+114	+138	157	163	164	187	183	208	206	206	199	182	177	169	139	142	161	163	134	171	157	110	90	61	31	27								
10	Stoneport, Mich.	+75	+73	+92	+118	137	145	147	147	166	163	190	189	186	181	164	163	151	115	120	146	158	130	154	141	97	76	48	9									
11	Rockport, Mich.	*79	+79	+92	+119	123	136	143	143	166	182	187	186	185	178	161	158	148	112	113	132	134	106	142	129	82	62	31										
12	Alpena, Mich.	*107	+107	+120	+143	131	145	151	152	174	171	195	193	192	185	168	165	156	109	107	124	125	97	129	116	69	49											
13	Au Sable, Mich.	*135	+135	+148	158	146	160	163	166	183	180	204	202	201	189	177	174	165	98	85	93	86	58	83	69	21												
14	East Tawas, Mich.	*155	+155	+168	175	163	176	180	182	199	196	220	218	217	210	194	190	181	110	94	95	88	60	68	54													
15	Bay City, Mich.	*202	+202	+215	222	210	223	228	229	245	243	267	265	264	257	240	237	228	153	136	137	130	102	13														
16	Saginaw, Mich.	*216	+216	+228	235	223	237	242	242	258	256	280	278	278	271	254	250	241	167	149	151	144	115															
17	Harbor Beach, Mich.	*178	+178	+191	171	159	171	176	176	194	190	214	213	212	205	188	185	175	79	56	47	32																
18	Port Sanilac, Mich.	*207	+207	+219	197	185	198	201	201	219	215	239	238	237	230	213	210	200	97	70	47																	
19	Goderich, Canada	+198	+198	204	169	159	172	172	174	192	189	213	211	210	207	187	183	174	64	36																		
20	Kincardine, Canada	+173	+174	174	141	128	142	149	144	162	158	182	181	180	176	156	153	144	30																			
21	Southampton, Canada	+166	+166	155	122	110	123	130	125	143	140	163	162	161	157	137	134	125																				
22	Wiarton, Canada (d)	+188	158	142	110	94	86	79	81	74	71	76	74	73	53	36	29																					
23	Owen Sound, Canada (d)	+197	167	152	119	103	97	97	89	79	75	71	70	69	46	29																						
24	Meaford, Canada (d)	+200	169	153	121	105	96	96	86	71	68	55	53	52	24																							
25	Collingwood, Canada (d)	+217	186	171	138	120	108	107	97	80	76	57	55	54																								
26	Penetanguishene, Canada (d)	+224	187	172	139	120	106	104	94	72	69	12	10																									
27	Midland, Canada (d)	+225	188	173	140	121	107	105	95	73	70	7																										
28	Port McNicoll, Canada (d)	+227	190	174	142	122	108	106	97	75	71																											
29	Depot Harbor, Canada (d)	193	155	140	107	87	73	71	82	6																												
30	Parry Sound, Canada (d)	197	159	143	111	91	77	75	65																													
31	Byng Inlet, Canada (d)	155	118	102	70	50	31	27																														
32	Key Harbor, Canada (d)	148	110	94	62	42	22																															
33	French River, Canada (d)	139	101	86	53	33																																
34	Killarney, Canada (d)	110	72	56	24																																	
35	Little Current, Canada	86	48	33																																		
36	Gore Bay, Canada	61	27																																			
37	Algoma Mills, Canada	43																																				
38	Thessalon, Canada	0																																				

(a) From foot of Grand River Ave.
(b) From sailing course point north of Old Mackinac Point.
(c) From abreast east end of U.S. center pier, and (except those marked &) via Middle Neebish and Detour; distances downbound through West Neebish are 1 mile less.
(d) Distances to Georgian Bay ports (except those marked *, +, &, %) are via the bay entrance from Lake Huron and St. Marys River points and via Little Current from North Channel points.

* Via False Detour and North Channels.
\+ Via Mississagi Strait and North Channel.
& Via Lake Nicolet, St. Joseph, and North Channels.
% Via Potagannissing Bay and North Channel.

EXPLANATION

Explanation generally applicable to all tables is published in Table 33.

Points in this table are arranged in geographical sequence proceeding from St. Marys River southward along the west shore, and returning northward up the east shore, around Georgian Bay, and westward through North Channel.

For determining distances to points located in other lakes, distances from all places listed in this table are given to the initial points Nos. 1 to 3, which also appear in the other tables respectively indicated by numeral designation. The through distance from a given point in this table to a given point in any other table is the sum of the respective distances to each given point from the initial point which is common to the two tables.

Table 37--DISTANCES BETWEEN POINTS ON LAKE MICHIGAN (statute miles)

Other tables to which initial point No. 1 is common:
34 - Lake Ontario and St. Lawrence River.
35 - Lake Erie, St. Clair, Detroit, and Niagara Rivers.
36 - Lake Huron and St. Marys River.
38 - Lake Superior.

		38 Beaver Island Harbor	37 Petoskey	36 Charlevoix	35 Traverse City	34 Frankfort	33 Portage Lake	32 Manistee	31 Ludington	30 Pentwater	29 White Lake	28 Muskegon	27 Grand Haven	26 Holland	25 Saugatuck	24 South Haven	23 St. Joseph	22 Michigan City	21 Gary	20 Indiana Harbor	19 South Chicago	18 Chicago	17 Waukegan	16 Kenosha	15 Racine	14 Milwaukee	13 Port Washington	12 Sheboygan	11 Manitowoc	10 Two Rivers	9 Kewaunee	8 Algoma	7 Sturgeon Bay	6 Green Bay	5 Menominee	4 Escanaba	3 Manistique	2 Port Inland
1	OLD MACKINAC POINT (34, 35, 36, 38)(a)	41	55	56	97	122	142	150	173	184	213	224	238	257	263	281	300	325	336	334	333	324	296	282	272	259	237	212	191	187	170	161	155	198	155	129	75	59
2	Port Inland, Mich.	31	66	55	88	96	116	123	146	157	186	197	211	229	235	253	271	298	314	308	304	298	270	254	245	226	204	179	161	152	131	124	110	149	104	78	23	
3	Manistique, Mich.	43	78	64	94	91	110	118	141	152	182	193	207	225	232	250	268	294	303	301	298	290	260	244	235	220	195	168	146	142	120	111	103	135	92	66		
4	Escanaba, Mich.	99	113	99	120	91	106	112	130	141	170	181	195	213	220	238	255	280	288	286	283	274	242	226	217	201	176	149	127	122	100	90	69	101	55			
5	Menominee, Mich. & Wis.(b)	*122	*134	*119	*138	80	86	87	98	108	135	146	159	177	183	200	216	239	246	243	240	230	198	184	172	155	130	103	81	75	52	43	22	49				
6	Green Bay, Wis. (city)(b)	*165	176	160	178	105	111	112	123	134	159	171	184	202	209	225	242	264	272	268	265	255	223	209	197	180	155	128	106	101	78	68	47					
7	Sturgeon Bay, Wis. (town)	123	129	113	131	58	64	65	76	87	113	124	137	155	162	178	195	217	225	222	218	208	176	162	150	133	108	81	58	54	30	21						
8	Algoma, Wis.	131	135	119	136	59	60	59	66	75	100	111	123	142	148	163	179	200	206	203	200	190	158	142	132	115	89	62	40	36	12							
9	Kewaunee, Wis.	138	143	126	143	62	60	58	61	70	93	104	116	135	141	156	171	192	197	194	191	181	149	133	123	105	79	53	31	26								
10	Two Rivers, Wis.	156	159	142	160	75	67	62	57	61	78	89	101	118	123	137	151	170	174	171	168	158	125	109	100	82	55	29	6									
11	Manitowoc, Wis.	161	163	147	164	79	71	66	60	64	79	90	102	118	123	137	150	169	173	169	166	156	123	107	97	79	53	26										
12	Sheboygan, Wis.	180	181	165	182	95	83	76	60	63	68	78	87	102	106	118	130	146	149	146	143	132	99	83	74	55	29											
13	Port Washington, Wis.	206	205	189	206	119	104	98	80	76	72	77	84	94	97	105	112	124	125	121	118	107	74	58	48	29												
14	Milwaukee, Wis.	228	227	211	228	140	125	117	97	91	78	80	83	88	89	93	96	104	103	99	96	85	51	35	26													
15	Racine, Wis.	242	241	225	242	153	137	129	108	100	81	80	80	79	80	80	78	84	83	78	75	64	30	14														
16	Kenosha, Wis.	252	251	234	252	163	147	138	117	108	86	87	86	82	82	79	75	76	73	67	64	54	18															
17	Waukegan, Ill.	266	265	249	266	177	160	152	130	122	100	96	93	86	84	78	70	64	58	52	49	38																
18	Chicago, Ill.	294	293	276	293	204	186	179	156	146	120	114	108	95	90	77	60	38	25	19	15																	
19	South Chicago, Ill.	302	301	285	302	213	196	188	165	154	127	120	114	100	95	79	60	33	14	7																		
20	Indiana Harbor, Ind.	304	303	287	304	215	198	189	167	156	129	122	115	99	95	79	59	31	13																			
21	Gary, Ind.	309	308	292	309	216	199	191	167	157	129	121	114	99	93	77	55	22																				
22	Michigan City, Ind.	295	294	278	295	206	189	181	157	146	117	108	99	82	75	57	36																					
23	St. Joseph, Mich.	269	268	251	268	179	162	154	130	119	88	78	69	50	44	24																						
24	South Haven, Mich.	251	250	233	250	161	144	136	111	101	69	58	49	29	22																							
25	Saugatuck, Mich.	232	231	215	232	143	126	118	93	83	51	40	29	8																								
26	Holland, Mich.	227	226	210	227	137	120	112	88	77	45	34	23																									
27	Grand Haven, Mich.	206	205	189	206	117	100	92	67	57	25	13																										
28	Muskegon, Mich.	195	194	178	195	106	89	80	56	46	13																											
29	White Lake, Mich.	184	183	167	184	95	78	69	45	35																												
30	Pentwater, Mich.	154	153	137	154	65	48	39	14																													
31	Ludington, Mich.	143	142	126	143	54	37	26																														
32	Manistee, Mich.	118	117	100	118	28	10																															
33	Portage Lake, Mich.	110	109	93	110	20																																
34	Frankfort, Mich.	93	92	75	92																																	
35	Traverse City, Mich.	69	58	45																																		
36	Charlevoix, Mich.	33	18																																			
37	Petoskey, Mich.	37																																				
38	Beaver Island Harbor, Mich.	0																																				

(a) From sailing course point north of Old Mackinac Point.
(b) Distances from Menominee and Green Bay to Lake Michigan points except those marked (*) are via Sturgeon Bay Canal. Via Rock Island Passage.

EXPLANATION

Explanation generally applicable to all tables is published in Table 33.

Points in this table are arranged in geographical sequence proceeding southward along the west shore and *returning northward along* the east shore.

For determining distances to points in other lakes, distances from all places listed in this table are given to Old Mackinac Point, and this initial point also appears in each of the other tables respectively indicated by numeral designation. The through distance from a given point in this table to a given point in any other table is the sum of the respective distances to each given point from Old Mackinac Point, common to the two tables. Thus, a through distance from a Lake Michigan point to a point in Lake Superior (Table 38) would be derived as follows:

Old Mackinac Point to Racine	272
Old Mackinac Point to Ashland	439
Racine to Ashland	711

Table 38--DISTANCES BETWEEN POINTS ON LAKE SUPERIOR (statute miles)

Other tables to which initial points Nos. 1-4 are common:
34 - Lake Ontario and St. Lawrence River.
35 - Lake Erie, St. Clair, Detroit, and Niagara Rivers.
36 - Lake Huron and St. Marys River.
37 - Lake Michigan.

		39 Gargantua Harbor	38 Michipicoten Harbor	37 Quebec Harbor	36 Peninsula Harbor	35 Rossport	34 Thunder Bay (Pt. Arthur)	33 Thunder Bay (Ft. William)	32 Passage Island	31 Rock of Ages	30 Grand Marais, Minn.	29 Taconite	28 Silver Bay	27 Two Harbors	26 Duluth	25 Superior	24 Port Wing	23 Bayfield	22 Washburn	21 Ashland	20 Ontonagon	19 Keweenaw W. Upper Ent.	18 Houghton	17 Dollar Bay	16 Lake Linden	15 Chassell	14 Portage Entry	13 Eagle Harbor	12 Copper Harbor	11 Mendota Canal	10 L'Anse	9 Huron Bay	8 Marquette	7 Munising	6 Grand Marais, Mich.	5 Whitefish Point	4 Sault Ste. Marie
1	PORT COLBORNE (34, 35)	666	697	691	771	809	848	847	804	838	880	909	927	946	970	968	939	912	920	924	850	807	796	793	789	791	782	779	764	764	792	779	735	706	667	617	575
2	PORT HURON (34, 35, 36)(a)	360	391	385	465	503	542	541	498	532	574	603	621	640	664	662	633	606	614	618	544	501	490	487	493	485	476	473	458	458	486	473	429	400	361	311	269
3	OLD MACKINAC POINT (34, 35, 36, 37, 38)(b)	181	212	206	285	324	363	362	319	353	395	426	444	461	485	483	454	426	435	439	365	322	311	308	314	306	297	294	279	279	307	294	249	221	182	134	90
4	SAULT STE. MARIE (37)(c)	91	121	116	195	234	273	272	229	263	305	334	352	371	394	393	364	336	345	349	274	232	221	218	224	215	207	204	189	189	217	204	159	131	92	42	
5	Whitefish Point, Mich.	54	83	74	153	192	231	230	187	221	263	292	310	329	352	351	322	294	303	307	232	190	179	176	182	173	165	162	147	147	175	162	117	89	50		
6	Grand Marais, Mich.	78	102	70	144	171	198	197	154	182	224	255	270	289	312	310	282	252	260	264	187	143	133	130	135	127	119	123	108	105	129	114	68	40			
7	Munising, Mich.	112	136	97	162	179	193	192	150	174	212	245	260	271	293	291	263	233	240	245	168	124	114	111	116	108	99	113	100	93	110	93	42				
8	Marquette, Mich. (docks)	135	154	112	160	164	171	170	128	149	181	228	239	239	261	260	231	201	209	213	136	93	84	81	84	76	68	91	76	67	78	62					
9	Huron Bay, Mich. (village)	165	179	132	159	152	157	156	113	110	142	156	181	201	223	222	193	163	171	175	98	54	44	41	46	38	30	74	60	44	39						
10	L'Anse, Mich.	179	192	146	169	162	145	144	108	95	127	151	168	186	208	206	178	148	156	160	83	39	29	26	31	23	14	70	71	51							
11	Mendota Canal, Mich.	138	152	105	125	117	122	121	78	103	145	172	190	212	234	232	204	174	182	186	110	69	55	52	58	50	41	42	27								
12	Copper Harbor, Mich.	137	145	100	112	99	100	99	56	77	119	142	161	185	208	206	178	150	159	163	88	45	56	59	71	65	60	16									
13	Eagle Harbor, Mich.	151	159	114	122	102	96	95	53	65	105	129	146	170	194	192	163	135	143	147	72	31	41	45	57	50	56										
14	Portage Entry, Mich.	168	181	135	157	149	130	129	94	81	113	136	153	171	193	192	163	133	141	145	68	25	14	11	17	9											
15	Chassell, Mich.	177	190	143	166	145	125	124	89	76	108	128	146	166	188	187	158	128	136	140	63	20	9	6	12												
16	Lake Linden, Mich.	185	198	151	174	151	131	130	95	82	113	136	153	172	194	193	163	134	142	146	69	26	15	11													
17	Dollar Bay, Mich.	180	192	146	163	139	119	118	83	70	102	122	140	160	182	181	152	122	130	134	57	14	3														
18	Houghton, Mich.	182	195	149	160	136	116	115	80	67	99	118	135	157	179	178	149	119	127	131	54	11															
19	Keweenaw Waterway, Upper Entry, Mich.	180	187	142	149	126	105	105	69	56	88	108	125	147	169	167	139	109	116	120	44																
20	Ontonagon, Mich.	221	228	183	189	165	117	116	103	68	76	86	95	114	136	135	106	74	78	82																	
21	Ashland, Wis.	295	304	258	261	227	164	163	165	115	85	77	62	71	93	92	63	16	5																		
22	Washburn, Wis.	291	300	254	256	222	160	159	161	111	81	72	57	67	89	88	59	12																			
23	Bayfield, Wis.	282	291	246	254	221	149	148	152	99	70	60	45	57	78	77	49																				
24	Port Wing, Wis.	312	319	275	272	233	169	168	175	121	83	56	35	22	34	32																					
25	Superior, Wis.	340	347	303	300	259	195	195	199	147	107	78	54	28	7																						
26	Duluth, Minn.	342	349	305	300	259	195	194	200	147	105	77	53	26																							
27	Two Harbors, Minn.	319	327	281	277	236	172	171	177	124	82	55	27																								
28	Silver Bay, Minn.	300	302	260	250	210	145	142	156	100	55	25																									
29	Taconite, Minn.	280	283	240	227	190	130	127	136	78	31																										
30	Grand Marais, Minn.	252	256	214	199	157	92	91	99	47																											
31	Rock of Ages, Mich.	209	213	171	155	112	49	48	53																												
32	Passage Island, Mich.	164	166	127	102	63	44	43																													
33	Thunder Bay (Ft. William), Canada	207	209	170	141	101	3																														
34	Thunder Bay (Pt. Arthur), Canada	208	209	171	142	102																															
35	Rossport, Canada	157	155	125	71																																
36	Peninsula Harbor, Canada	114	112	86																																	
37	Quebec Harbor, Canada	41	49																																		
38	Michipicoten Harbor, Canada	32																																			
39	Gargantua Harbor, Canada	0																																			

(a) From foot of Grand River Ave.
(b) From sailing course point north of Old Mackinac Point.
(c) From abreast east end of United States center pier. Via Keweenaw Waterway.

EXPLANATION

Explanation generally applicable to all tables is published in Table 33.

Points in this table are arranged in geographical sequence proceeding westward along the south shore and returning eastward around the north shore.

For determining distances to points located in other lakes, distances from all places listed in this table are given to the initial points Nos. 1 to 4, which also appear in the other tables respectively indicated by numeral designation. The through distance from a given point in this table to a given point in any other table is the sum of the respective distances to each given point from the initial point which is common to the two tables. Thus, Port Huron being the common point for determining distances from Lake Superior points to points in Lake Erie (Table 35, a through distance would be derived as follows:

Port Huron to Ontonagon	544
Port Huron to Dunkirk	292
Ontonagon to Dunkirk	836

Distances on New York State Waterways (statute miles)

City and local point	From Buffalo, Erie Basin	From Oswego, Lake Terminal	From Troy Lock	From New York City, (Battery)
Erie Canal	Miles	Miles	Miles	Miles
Buffalo-Erie Basin	----------	214.2	353.3	505.2
Tonawanda-Terminal	12.9	201.3	340.3	492.3
Lockport-Lower Terminal	30.9	183.3	322.3	474.3
Rochester	93.9	126.9	265.9	417.9
Newark-Dock	124.3	89.9	228.9	380.8
Syracuse-Terminal	190.1	37.2	176.2	328.2
Rome-Terminal	235.9	69.1	117.3	269.3
Utica-Terminal	249.9	83.1	104.9	256.8
Little Falls-Terminal	270.8	104.0	82.5	234.4
Amsterdam-Terminal	313.3	146.5	40.0	191.9
Schenectady	330.1	163.3	23.8	175.8
Cohoes	351.6	184.8	1.7	153.6
Troy Lock	353.3	186.5	---------	151.9
Cayuga and Seneca Canals				
Watkins Glen	201.4	116.8	255.9	407.9
Ithaca	191.4	106.7	245.8	397.8
Oswego Canal				
Fulton-Dock wall	202.5	11.7	174.7	326.7
Oswego-Lake Terminal	214.2	----------	186.5	338.4
Champlain Canal and Lake				
Mechanicville-Terminal	360.1	193.3	11.4	163.3
Fort Edward-Terminal	388.7	222.0	40.1	192.0
Whitehall-Terminal	411.2	244.5	62.6	214.5
Burlington-Landing	481.8	315.1	133.1	285.1
Plattsburgh-Terminal	497.2	330.5	148.5	300.5
Rouses Point-Terminal	533.3	366.5	173.0	325.0
Hudson River				
Troy-Terminal	354.7	187.9	1.4	150.5
Albany	360.4	193.6	7.1	144.8
Hudson	388.8	222.0	36.9	116.4
Poughkeepsie	429.5	262.7	76.2	75.7
New York City (Battery)	505.2	338.4	151.9	---------

Conversion of Compass Points to Degrees

	Points	Angular measure				Points	Angular measure		
NORTH TO EAST		°	′	″	SOUTH TO WEST		°	′	″
North	0	0	00	00	South	16	180	00	00
N¼E	¼	2	48	45	S¼W	16¼	182	48	45
N½E	½	5	37	30	S½W	16½	185	37	30
N¾E	¾	8	26	15	S¾W	16¾	188	26	15
N by E	1	11	15	00	S by W	17	191	15	00
N by E¼E	1¼	14	03	45	S by W¼W	17¼	194	03	45
N by E½E	1½	16	52	30	S by W½W	17½	196	52	30
N by E¾E	1¾	19	41	15	S by W¾W	17¾	199	41	15
NNE	2	22	30	00	SSW	18	202	30	00
NNE¼E	2¼	25	18	45	SSW¼W	18¼	205	18	45
NNE½E	2½	28	07	30	SSW½W	18½	208	07	30
NNE¾E	2¾	30	56	15	SSW¾W	18¾	210	56	15
NE by N	3	33	45	00	SW by S	19	213	45	00
NE¾N	3¼	36	33	45	SW¾S	19¼	216	33	45
NE½N	3½	39	22	30	SW½S	19½	219	22	30
NE¼N	3¾	42	11	15	SW¼S	19¾	222	11	15
NE	4	45	00	00	SW	20	225	00	00
NE¼E	4¼	47	48	45	SW¼W	20¼	227	48	45
NE½E	4½	50	37	30	SW½W	20½	230	37	30
NE¾E	4¾	53	26	15	SW¾W	20¾	233	26	15
NE by E	5	56	15	00	SW by W	21	236	15	00
NE by E¼E	5¼	59	03	45	SW by W¼W	21¼	239	03	45
NE by E½E	5½	61	52	30	SW by W½W	21½	241	52	30
NE by E¾E	5¾	64	41	15	SW by W¾W	21¾	244	41	15
ENE	6	67	30	00	WSW	22	247	30	00
ENE¼E	6¼	70	18	45	WSW¼W	22¼	250	18	45
ENE½E	6½	73	07	30	WSW½W	22½	253	07	30
ENE¾E	6¾	75	56	15	WSW¾W	22¾	255	56	15
E by N	7	78	45	00	W by S	23	258	45	00
E¾N	7¼	81	33	45	W¾S	23¼	261	33	45
E½N	7½	84	22	30	W½S	23½	264	22	30
E¼N	7¾	87	11	15	W¼S	23¾	267	11	15
EAST TO SOUTH					WEST TO NORTH				
East	8	90	00	00	West	24	270	00	00
E¼S	8¼	92	48	45	W¼N	24¼	272	48	45
E½S	8½	95	37	30	W½N	24½	275	37	30
E¾S	8¾	98	26	15	W¾N	24¾	278	26	15
E by S	9	101	15	00	W by N	25	281	15	00
ESE¾E	9¼	104	03	45	WNW¾W	25¼	284	03	45
ESE½E	9½	106	52	30	WNW½W	25½	286	52	30
ESE¼E	9¾	109	41	15	WNW¼W	25¾	289	41	15
ESE	10	112	30	00	WNW	26	292	30	00
SE by E¾E	10¼	115	18	45	NW by W¾W	26¼	295	18	45
SE by E½E	10½	118	07	30	NW by W½W	26½	298	07	30
SE by E¼E	10¾	120	56	15	NW by W¼W	26¾	300	56	15
SE by E	11	123	45	00	NW by W	27	303	45	00
SE¾E	11¼	126	33	45	NW¾W	27¼	306	33	45
SE½E	11½	129	22	30	NW½W	27½	309	22	30
SE¼E	11¾	132	11	15	NW¼W	27¾	312	11	15
SE	12	135	00	00	NW	28	315	00	00
SE¼S	12¼	137	48	45	NW¼N	28¼	317	48	45
SE½S	12½	140	37	30	NW½N	28½	320	37	30
SE¾S	12¾	143	26	15	NW¾N	28¾	323	26	15
SE by S	13	146	15	00	NW by N	29	326	15	00
SSE¾E	13¼	149	03	45	NNW¾W	29¼	329	03	45
SSE½E	13½	151	52	30	NNW½W	29½	331	52	30
SSE¼E	13¾	154	41	15	NNW¼W	29¾	334	41	15
SSE	14	157	30	00	NNW	30	337	30	00
S by E¾E	14¼	160	18	45	N by W¾W	30¼	340	18	45
S by E½E	14½	163	07	30	N by W½W	30½	343	07	30
S by E¼E	14¾	165	56	15	N by W¼W	30¾	345	56	15
S by E	15	168	45	00	N by W	31	348	45	00
S¾E	15¼	171	33	45	N¾W	31¼	351	33	45
S½E	15½	174	22	30	N½W	31½	354	22	30
S¼E	15¾	177	11	15	N¼W	31¾	357	11	15
South	16	180	00	00	North	32	360	00	00

TABLE OF AZIMUTHS OF RANGES ON THE GREAT LAKES

AZIMUTHS ARE RECKONED CLOCKWISE FROM 000° AT NORTH- FROM FRONT TO REAR LIGHT

Location and name of range	True azimuth
ST. LAWRENCE RIVER	
Cornwall Island	241 1/4°
Wilson Hill	068 3/4°
Weaver Shoal	262 1/4°
Goose Neck Island Shoals	255°
Doran Shoal	040 1/4°
Galop Island	227 1/4°
DeWatteville Island	037°
Irvine Point	013 1/4°
Bayfield Island Directional Light	263°
LAKE ONTARIO	
Niagara-on-the-Lake	149 1/2°
Port Dalhousie	177°
Port Weller	180°
Toronto Main Harbor Channel Entrance	002 1/2°
Toronto Harbor West Entrance	053 1/2°
Oshawa Harbor	328°
Cobourg	008 1/4°
LAKE ERIE	
Erie Harbor Entrance	235°
Erie Harbor	054 1/2°
Moseley Channel	237°
Sandusky Straight Channel Inner	017°
Sandusky Bay Exit Channel	063 3/4°
Maumee Bay-Manhattan	237 3/4°
Otter Creek	284°
Monroe Harbor	291 3/4°
Kingsville Entrance	308 1/4°
Wheatley Wharf	343 1/2°
Rondeau Harbor West Breakwater	012°
Port Stanley	341 3/4°
Port Burwell E. Pier	355°
Port Dover	021 1/2°
Nanticoke (Approach)	043 1/4°
Nanticoke (Inner)	343°
Port Maitland	020 3/4°
Strawberry Island Upper Cut	000 1/2°
Strawberry Island Lower Cut	139 1/2°
Grand Island	313 1/2°
Tonawanda Harbor Channel	001°
DETROIT RIVER	
Bar Point Range	013 1/2°
Hackett Reach-Amherstburg	015°
Amherstburg	355 3/4°
Limekiln Crossing	003°
Fort Malden	162 1/2°
Grosse Ile South Channel	342 1/2°
LAKE ST. CLAIR	
Peach Island	227 3/4°
Black Creek	297 1/4°
ST. CLAIR RIVER	
St. Clair Flats Canal	041°
Squirrel Island	064 1/4°
Harsens Island	023 1/2°
Russell Island Lower Front Light and Middle Rear Light	042°
Chenal Ecarte	138 1/4°
Corunna	167 1/4°
Fort Gratiot	207 1/4°
LAKE HURON	
Point Edward Range	180 1/2°
Saginaw Bay	211 1/4°
Essexville	160°
Thunder Bay Quarries Channel (Alpena, Mich.)	358°
Huron Portland Cement Co.'s Channel (Alpena, Mich.)	344°
Presque Isle Harbor	273 3/4°
Calcite Incoming	236°
Cheboygan River	212 3/4°
McKay Bay (Port Dolomite)	309°
North Channel-Blind River	051 1/4°
North Channel-Eddy Wharves	359 1/2°
South Baymouth	024 3/4°
Georgian Bay-Byng Inlet	074 1/2°
Georgian Bay-Pte aux Baril	105°
Georgian Bay-Snug Harbor	070 3/4°
Georgian Bay-Jones Island (Parry Sound)	131 3/4°
LAKE HURON-Continued	
Georgian Bay-Breboeuf	088°
Victoria Harbor	148 1/2°
Georgian Bay-Port McNicoll	152 1/2°
Georgian Bay-Midland Point	282 3/4°
Georgian Bay-Collingwood Shore	180 3/4°
Georgian Bay-Owen Sound	195°
Stokes Bay	068°
Saugeen (Southampton)	095 1/4°
Port Elgin	109°
Kincardine	104 1/2°
Goderich North Pier	087°
Bayfield	076 3/4°
Grand Bend	096°
LAKE MICHIGAN	
Ludington North Breakwater	098°
Grand Haven South Pierhead Entrance	080 1/4°
Holland	086 1/2°
St. Joseph	108°
Gary East Pierhead	181°
Buffington Harbor	236 1/2°
Calumet River North Slip	288 1/2°
Diversey Yacht Harbor	270°
Great Lakes Harbor	302 3/4°
Kenosha Breakwater Light to Kenosha Light	263 3/4°
Oak Creek	268°
Manitowoc Breakwater Light and Pierhead Light	267°
Plum Island	331°
Green Bay-Menominee Pierhead	245°
Port Inland Outer	000°
Port Inland Inner	047°
ST. MARYS RIVER	
Hay Point	128°
Winter Point	321°
Sailors Encampment Upbound	017°
Rains Wharf Upbound	314 1/4°
Point of Woods	314 1/4°
Dark Hole West Range Upbound	357°
Harwood Point West Range	357°
Stribling Point South Light and Rear Light	112°
Middle Neebish North Range Front Light and Rear Beacon	292°
Middle Neebish South Range	292°
Lower Nicolet West Range	330°
Upper Nicolet	339 1/2°
Lake Nicolet-Frechette Point	323 1/4°
Lake Nicolet-Six mile Point	153°
Bayfield Rock	109°
Canadian Canal Lower Entrance	322 1/2°
Canadian Canal Upper Entrance	051°
Vidal Shoals Channel	076°
Point aux Pins	233°
Brush Point	074 1/4°
Birch Point	138 3/4°
Wilson Channel	053 1/4°
West Neebish Channel Upper Range	160°
West Neebish Channel Range	181 1/2°
LAKE SUPERIOR	
Munising	217°
Grand Island Harbor	164 1/2°
Marquette	302 1/4°
Keweenaw Waterway-South Range	136°
Princess Point	164 1/2°
Keweenaw Waterway-Rouleau Point	033 1/2°
Copper Harbor	190°
Eagle Harbor (Mich.)	150°
Superior Front Channel	136°
St. Louis Bay-S. Channel Front Light and N. & S. Channel Rear Light	247 1/2°
St. Louis Bay-N. Channel Front Light and N. & S. Channel Rear Light	227°
St. Louis River-Minnesota Channel	084 1/2°
Duluth Outer Light and Inner Light	245°
Taconite	028 1/4°
Thunder Bay (Fort William)-Mission Channel	289°
Michipicoten Island-Quebec Harbor	000 3/4°

Conversion Tables

INTERNATIONAL NAUTICAL MILES TO STATUTE MILES

1 nautical mile 6,076.12 feet or 1,852 meters 1 statute mile = 5,280 feet or 1,609.35 meters

Nautical miles	0	1	2	3	4	5	6	7	8	9
0	0.000	1.151	2.302	3.452	4.603	5.754	6.905	8.055	9.206	10.357
10	11.508	12.659	13.809	14.960	16.111	17.262	18.412	19.563	20.714	21.865
20	23.016	24.166	25.317	26.468	27.619	28.769	29.920	31.071	32.222	33.373
30	34.523	35.674	36.825	37.976	39.126	40.277	41.428	42.579	43.730	44.880
40	46.031	47.182	48.333	49.483	50.634	51.785	52.936	54.087	55.237	56.388
50	57.539	58.690	59.840	60.991	62.142	63.293	64.444	65.594	66.745	67.896
60	69.047	70.197	71.348	72.499	73.650	74.801	75.951	77.102	78.253	79.404
70	80.554	81.705	82.856	84.007	85.158	86.308	87.459	88.610	89.761	90.911
80	92.062	93.213	94.364	95.515	96.665	97.816	98.967	100.118	101.268	102.419
90	103.570	104.721	105.871	107.022	108.173	109.324	110.475	111.625	112.776	113.927

STATUTE MILES TO INTERNATIONAL NAUTICAL MILES

Statute miles	0	1	2	3	4	5	6	7	8	9
0	0.000	0.869	1.738	2.607	3.476	4.345	5.214	6.083	6.952	7.821
10	8.690	9.559	10.428	11.297	12.166	13.035	13.904	14.773	15.642	16.511
20	17.380	18.249	19.118	19.986	20.855	21.724	22.593	23.462	24.331	25.200
30	26.069	26.938	27.807	28.676	29.545	30.414	31.283	32.152	33.021	33.890
40	34.759	35.628	36.497	37.366	38.235	39.104	39.973	40.842	41.711	42.580
50	43.449	44.318	45.187	46.056	46.925	47.794	48.663	49.532	50.401	51.270
60	52.139	53.008	53.877	54.746	55.615	56.484	57.353	58.222	59.091	59.959
70	60.828	61.697	62.566	63.435	64.304	65.173	66.042	66.911	67.780	68.649
80	69.518	70.387	71.256	72.125	72.994	73.863	74.732	75.601	76.470	77.339
90	78.208	79.077	79.946	80.815	81.684	82.553	83.422	84.291	85.160	86.029

FEET TO METERS

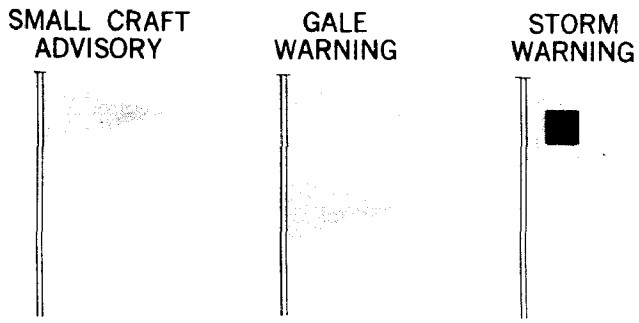
Feet	0	1	2	3	4	5	6	7	8	9
0	0.00	0.30	0.61	0.91	1.22	1.52	1.83	2.13	2.44	2.74
10	3.05	3.35	3.66	3.96	4.27	4.57	4.88	5.18	5.49	5.79
20	6.10	6.40	6.71	7.01	7.32	7.62	7.92	8.23	8.53	8.84
30	9.14	9.45	9.75	10.06	10.36	10.67	10.97	11.28	11.58	11.89
40	12.19	12.50	12.80	13.11	13.41	13.72	14.02	14.33	14.63	14.93
50	15.24	15.54	15.85	16.15	16.46	16.76	17.07	17.37	17.68	17.98
60	18.29	18.59	18.90	19.20	19.51	19.81	20.12	20.42	20.73	21.03
70	21.34	21.64	21.95	22.25	22.55	22.86	23.16	23.47	23.77	24.08
80	24.38	24.69	24.99	25.30	25.60	25.91	26.21	26.52	26.82	27.13
90	27.43	27.74	28.04	28.35	28.65	28.96	29.26	29.57	29.87	30.17

METERS TO FEET

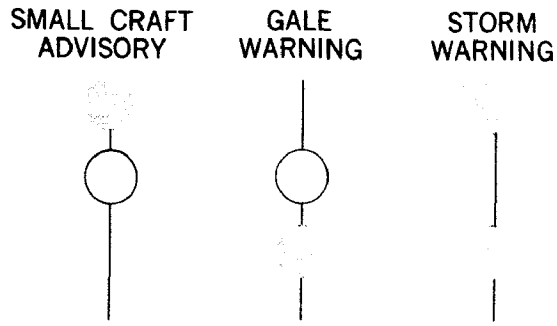
Meters	0	1	2	3	4	5	6	7	8	9
0	0.00	3.28	6.56	9.84	13.12	16.40	19.68	22.97	26.25	29.53
10	32.81	36.09	39.37	42.65	45.93	49.21	52.49	55.77	59.06	62.34
20	65.62	68.90	72.18	75.46	78.74	82.02	85.30	88.58	91.86	95.14
30	98.42	101.71	104.99	108.27	111.55	114.83	118.11	121.39	124.67	127.95
40	131.23	134.51	137.80	141.08	144.36	147.64	150.92	154.20	157.48	160.76
50	164.04	167.32	170.60	173.88	177.16	180.45	183.73	187.01	190.29	193.57
60	196.85	200.13	203.41	206.69	209.97	213.25	216.54	219.82	223.10	226.38
70	229.66	232.94	236.22	239.50	242.78	246.06	249.34	252.62	255.90	259.19
80	262.47	265.75	269.03	272.31	275.59	278.87	282.15	285.43	288.71	291.99
90	295.28	298.56	301.84	305.12	308.40	311.68	314.96	318.24	321.52	324.80

NATIONAL WEATHER SERVICE COASTAL WARNING DISPLAYS

DAYTIME SIGNALS



NIGHT (LIGHT) SIGNALS



Note: Shaded area represents the color RED on flags and lights.

EXPLANATION OF DISPLAYS

SMALL CRAFT ADVISORY: One RED pennant displayed by day and a RED light ABOVE a WHITE light at night, to alert mariners to sustained (more than two hours) weather or sea conditions, either present or forecast, that might be hazardous to small boats. The Small Craft Advisory relates to conditions within 5 miles of shore. Mariners learning of a Small Craft Advisory are urged to determine immediately the reason by tuning their radios to the latest marine broadcasts. Decision as to the degree of hazard will be left up to the boatman, based on his experience and size and type of boat.
The threshold conditions for the Small Craft Advisory are usually 18 knots (21 mph) of wind (less than 18 knots in some dangerous waters) or hazardous wave conditions.

GALE WARNING: Two RED pennants displayed by day and a WHITE light ABOVE a RED light at night, to indicate that winds of 34 to 47 knots (39 to 54 mph) are forecast for the area.

STORM WARNING: A single, square RED flag with a BLACK center displayed during daytime, and two RED lights at night, to indicate that winds of 48 knots (55 mph) and above are forecast for the area. (This is the maximum warning; hurricane warnings are not issued for the Great Lakes).

NOTE: SIGNALS ARE DISPLAYED DURING THE GREAT LAKES BOATING SEASON (APR. 1 - OCT. 31)

These signals are displayed at stations indicated by this symbol on the charts:
O NWS SIG STA (formerly W B SIG STA)

NOTICE: The National Weather Service issues a SPECIAL MARINE WARNING BULLETIN whenever a severe local storm or strong wind of brief duration is imminent, and is not covered by existing warnings or advisories. No visual displays will be used with the Special Marine Warning Bulletin; boaters will be able to receive these special warnings by keeping tuned to a NOAA VHF-FM, Coast Guard, or a commercial radio station carrying marine weather.

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(10-72)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

COAST PILOT REPORT

PLEASE MAIL TO:

Director
National Ocean Survey
National Oceanic and Atmospheric Administration
ATTENTION: C324
Rockville, Maryland 20852

This record of your experience and observations when coasting, entering port, and/or following inside channels will be used to correct, amplify, or confirm the description now given in the Coast Pilot.

Please use additional sheets if more space is needed.

Additional report forms will be provided upon receipt of each report.

GEOGRAPHIC LOCATION			
LATITUDE	LONGITUDE	CHART NUMBER	COAST PILOT NUMBER
VESSEL		MASTER/COMMANDING OFFICER	
DATE OF OBSERVATION		OBSERVER	

I. LANDMARKS: Mention those visible from seaward and useful for navigation (day and/or night); include natural ranges and indicate the pair of marks forming a range. Photographs of landmarks difficult to describe are solicited; each view should be labeled with the distance off and the direction towards which the camera was pointed.

TYPE	CHARTED		LATITUDE (Approximate)	LONGITUDE (Approximate)	DESCRIPTIVE INFORMATION HELPFUL IN IDENTIFICATION
	YES	NO			

II. RADAR: List best radar targets and, if known, give maximum useful radar range at which the object can be positively identified and used. Mention under remarks places you have observed radar returns to be misleading.

NAME OR TYPE OF FEATURE *(Include approximate latitude and longitude if necessary to identify on chart)*	MAXIMUM USEFUL RANGE

III. ROUTES: Where entrance and inside routes are not marked by aids to navigation, show recommended directions for Coast Pilot (latitude and longitude of entrance point, and distances and true courses made good); include natural steering ranges if available.

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IV. DANGERS: Mention those of concern to the navigator where special caution should be indicated in the Coast Pilot.

V. CURRENTS: Indicate places you have experienced conditions of current where special caution should be mentioned in the Coast Pilot.

VI. ANCHORAGES: Mention best anchorage in the area and other secure anchorages having good holding ground.

LOCATION *(Include anchorage bearings and natural ranges if available)*

TYPE OF BOTTOM OBSERVED:

	EXCEL.	GOOD	FAIR	POOR	COMMENT
HOLDING QUALITY					
PROTECTION OFFERED					
ACCESSIBILITY					

RECOMMENDED FOR VESSELS:

LENGTH	DRAFT
____ TO ____ FT.	____ TO ____ FT.

VII. REMARKS:

VIII. OTHER COAST PILOT CHANGES

U.S. COAST PILOT

NUMBER	EDITION	PAGE	LINE(S)

NOTE: Any chart(s) submitted with your report to show conditions will be replaced free of charge.

READ: STRIKE OUT: INSERT AFTER: *(Circle one)*