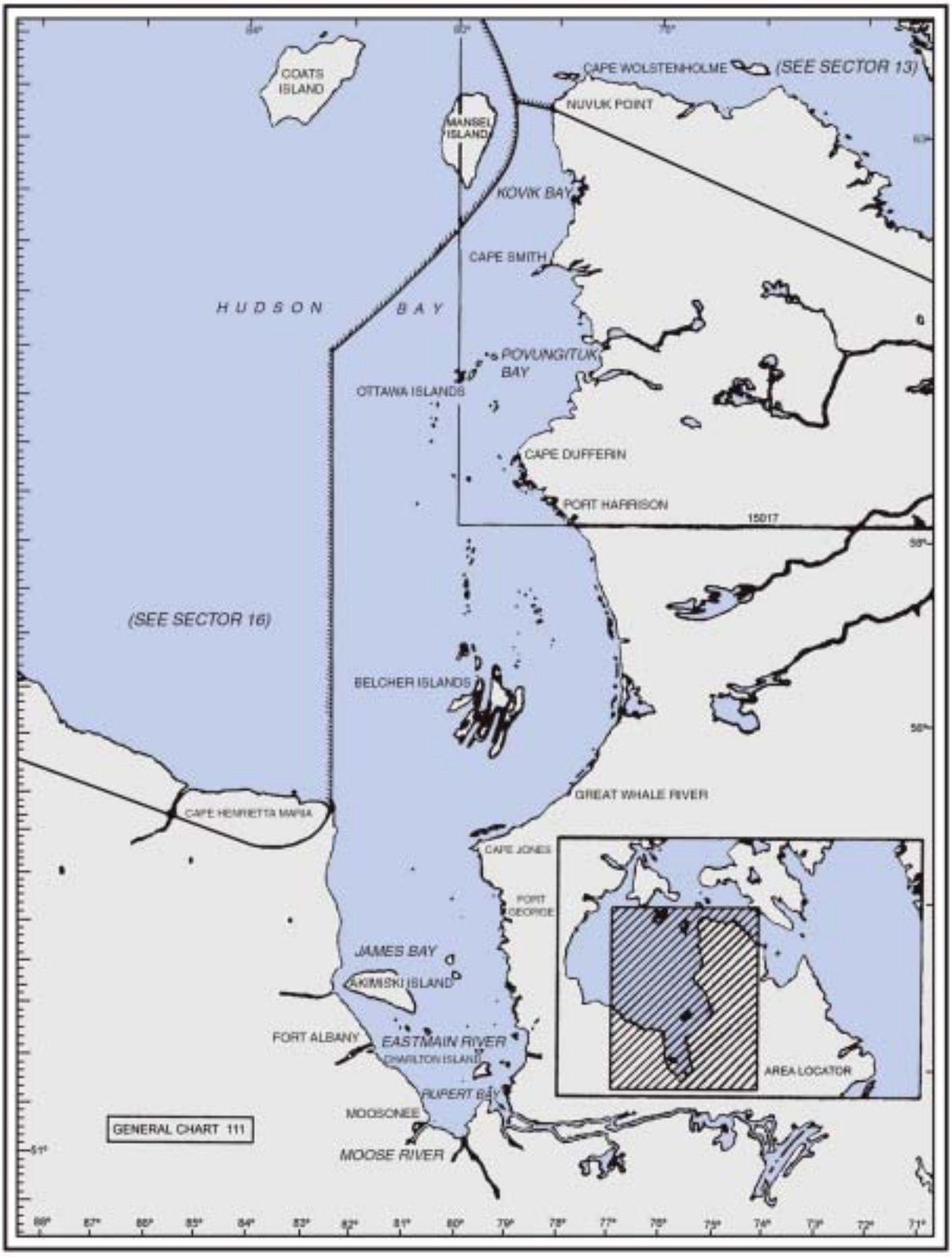
Click on "See Sector" to be hotlinked to that Sector.



Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.

SECTOR **15** — CHART INFORMATION

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SECTOR 15

HUDSON BAY—EAST SIDE AND JAMES BAY

Plan.—This sector describes the E shore of Hudson Bay, from Pointe Nuvuk to Pointe Louis XIV (Cape Jones). The sequence is from N to S.

For James Bay, the E shore is described first from the E entrance point S to the head of the bay, then N to the W entrance point.

Off-lying islands are described with their adjacent shoreline.

General Remarks

15.1 Hudson Bay is a very large inland sea which penetrates deeply into the NE part of the Canadian mainland. Hudson Strait is the main access route into the bay from the Atlantic. From the N entry can be made, with favorable ice conditions, through Fury and Hecla Straits.

See the general description at the beginning of paragraph 13.6 for information regarding the Arctic Canada Traffic System as it applies to Hudson Bay and James Bay.

For the purpose of this volume, the N boundary of Hudson Bay may be considered to extend from Pointe Nuvuk, the NW extremity of the Ungava Peninsula, to Seahorse Point, the E extremity of Southampton Island. From this point to the W mainland the boundary follows the S coast of Southampton Island to Cape Kendall at its SW extremity, where it crosses to Cape Fullerton, the NW entrance point to Hudson Bay and the SW entrance point to Roes Welcome Sound.

Hudson Bay is bounded by the province of Quebec on its E side and by the provinces of Ontario and Manitoba on the W. The district of Keewatin bounds the N and NW sides of the bay.

Coats Island and Mansel Island lie immediately inside the entrance at the NE corner of Hudson Bay; otherwise, the main body of the bay is open and unobstructed. Several island groups and chains lie along the E shore; from N to S they are the Ottawa Islands, the Sleeper Islands, the Nastapoka Islands, and the Belcher Islands. Akimiski Island, the Twins, and the Charlton Islands lie in James Bay. The W side of Hudson Bay is generally clear of islands.

Hudson Bay is 835 miles long from the S extremity of James Bay to the S side of Southampton Island. There is an average width of 100 miles over the greater part of the bay.

Except for the E shore, Hudson Bay is remarkably free of rocks and shoals, and has an average depth of 128m. James Bay has general depths of 36.6 to 54.9m in its central part, but much of the bay is quite shallow with drying mud flats extending from its shores.

The shores of Hudson Bay are lower than those in Hudson Strait, with general elevations of 61 to 91m.

Large rivers emptying into the E side of Hudson Bay are the Nastapoka River and the Grande Riviere de la Baleine. The Grande Riviere, the Eastmain River, the Broadback River, the Notaway River, the Moose River, the Abitibi River, the Albany River, and the Atawapiskat River all flow into James Bay. The Winisk River and the Severn River discharge into the SW part of Hudson Bay, and the Nelson River and the Churchill River empty into the W side. Three rivers, the Thelon, the Kazan, and the Dubawnt flow into Baker Lake and then by way of Chesterfield Inlet into Hudson Bay.

Caution.—No description of coastal tracks on the E side of Hudson Bay is given because of inadequate chart coverage, scarcity of soundings on existing charts, and the possibility of uncharted dangers.

Certain designated danger areas in Hudson Bay have been established for rocket-firing purposes.

It is recommended that ships contact Churchill Marine Radio before passage through Hudson Bay.

Winds—Weather

15.2 Hudson Bay—James Bay.—Few marine weather observations have been collected over Hudson Bay and James Bay. Of those on record, most have been from the main shipping route from Churchill through Hudson Strait. Settlements are sparse along the coasts and likewise are the number of weather reporting stations. The flat terrain along most of the coasts, and the sparse tree cover, make the shoreline reports reasonably indicative of weather over the bays.

The ice cover acts almost like a land surface through the depth of winter and early spring. Except for Arctic sea smoke from the shore leads, the waters have practically no effect on the predominately Arctic air masses. When temperatures rise above freezing, the melting ice surface cools the lower layers of the atmosphere encouraging the formation of fog, especially as the areas of water increase in size around the shore. On disappearance of the last ice in the S part of Hudson Bay (in late July or early August), the temperatures of the bay waters rise slowly towards their maximum while mean air temperatures trend downward. By early September the two reach equilibrium. Thereafter, the bay is a heat and moisture source for the overlying cold air masses, an influence that encourages the formation of clouds of vertical development, and showers of rain or snow. As the ice cover advances in October and November from the NW, the heating is gradually removed and is completed when ice cover reaches the SW corner of Hudson Bay.

Mean storm tracks cross Hudson Bay year round. The primary storm track of the short summer does not usually carry deep low centers. In September through November, intense storms often curve N through Hudson Bay. Thereafter, the deeper storms are likely to take a track through the Great Lakes and the St. Lawrence Valley. In winter, the storms on the secondary track through Hudson Bay are usually the centers of occluded depressions and apt to create strong winds, but little snowfall over the bay.

Hudson Bay—East Side.—Strong winds are not frequent in the period from May through August. The higher frequencies are reached in November,when major storms cross the bay. In the S, the peak of strong winds frequency includes November

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and December. In September and October, while the W side of the bay shows strong winds out of the NW, Inukjuak's stronger winds are from the W, SW, and S while Poste-de-la-Baleine's are from the W and sometimes from the E. These directions are reflections of the cyclonic activity over the bay in the fall. The longest period of consecutive days with gales in this area is approximately four.

The winter temperatures decrease about four degrees from Pointe Louis XIV to Inukjuak, then become fairly uniform N to Hudson Strait, rarely climbing above freezing and able to drop into the minus fifties December through March. Daily mean temperatures rise to freezing at Poste-de-la-Baleine about May 15, Inukjuak about May 26, and Cape Wolstenholme in early June. Summer temperatures can show wide fluctuations due to air mass and wind direction changes. In July, winds frequently blow off the cool waters, a flow that keeps temperatures in the forties. This circulation is mostly responsible for the July mean daily maximum at Inukjuak (13.2˚C) being nearly 7˚C lower than at Churchill (16.9˚C). With a flow off the land, temperatures can rise into the nineties during the period June to September in the S, into the eighties in June and July around Inukjuak, and into the seventies in July and August at Cape Wolstenholme. The S advance of freezing temperatures reaches Cape Wolstenholme about October 1, Inukjuak by mid-October, and Poste-de-la-Baleine and Pointe Louis XIV by October 25. Daily minimum temperatures near -32˚C can be expected at Cape Wolstenholme about November 30 and 2 weeks later along the entire coast line, as freeze-over of the bay enables Arctic air to settle in over the E half of Canada.

Annual snowfall over the N half of the coast is quite variable. Inukjuak's annual total of 140cm is the average of values that range from 60 to 220cm The settlement normally obtains the major part of its snowfall in November while cold Arctic air sweeps across the open waters of the bay. Spreading ice cover cuts off the moisture supply to reduce the December snowfall to about half of November's. Farther S, in the Poste-de-la-Baleine to Pointe Louis XIV sector, the presence of open water and proximity to the major storm tracks give higher annual snowfalls, averaging nearly 250cm. Like Inukjuak, about one-fifth of the snowfall at Poste-de-la-Baleine occurs in November.

The bay is a notable moisture source for fog development along the E coast. During the majority of fog occurrences, winds are onshore. July and August each average 10 days with fog. Seventy-five per cent of the days with fog do not last for more than 2 consecutive days. Several 8-day stretches have been observed, with one as long as 10 days at Inukjuak. Periods as long as 26 days at Inukjuak and 11 days at Poste-de-la-Baleine have been observed with no fog in the July and August period, when fog is most probable.

Ice

15.3 Because of its inland location and its latitude, Hudson Bay is covered with ice for a longer period than it is open water. Freeze-up is a lengthy process because of the great size of the bay, but ice is plentiful from early November until mid-July, and open water only occurs from mid-August until mid-October. As a result, it is preferable to consider the yearly regime from freeze-up to break-up rather than by calendar year.

The first ice formation in the bay is usually in late October in the coastal inlets in the NW sector, but in some seasons there may also be a simultaneous development in the cold waters of Foxe Channel in the NE portion. As the weather grows progressively colder the ice spreads S along the shore more rapidly than it extends seaward. At Churchill, ice forms in the river in mid-October, but it is not until early November that the coastal waters of the bay begin to freeze. Through the rest of the month the same progression occurs, and by mid-November ice is forming in the rivers of St. James Bay, although it is not until late in the month that freeze-up of the bay at Poste-de-la-Baleine develops.

If one compares the average temperatures at Churchill and Inukjuak, it is apparent that some heating takes place over the bay because of open water through most of December.

During the winter, a 5-mile belt of fast ice develops in most sectors and it is not unusual for the whole area S and E of the Belcher Islands to be covered with fast ice. Thickness in level shorefast ice averages 0.8 to 1m on January 1, and 1.6 to 2.2m by May 1.

Outside the fast ice the bay is nearly filled with drifting pack ice which moves about in response to the wind. After a period of NW winds a flaw lead will extend from N of Churchill to Cape Kendall, and there will likely be smaller openings in the lee of Coatsl Island and Mansel Island. In the subzero temperatures of January, February, and March this soon refreezes only to be disrupted by the other ice motions. In this manner a variable pack is built up composed of ridges and hummock areas of new, young, and first year ice that is somewhat thicker and rougher in the S areas because of the mean wind flow from NW to SW.

As temperatures rise in May and June, refreezing after the ice has been displaced by the wind no longer occurs, and a flaw lead from Coral Harbor to Chesterfield Inlet and Eskimo Point becomes persistent. Similar openings in the lee of Coats Island and Mansel Island also occur as do leads along the E shore of the bay. In some years, E winds can predominate and the normal lead is suppressed while a broad lead develops from Cape Wolstenholme to Cape Jones. In these years the whole area E of the Belcher Islands, he Sleeper Islands, he Ottawa Islands, and Coats Island will clear long before the W coast begins to open.

The normal progression of clearing is for the pack to retreat S from the Chesterfield Inlet to Southampton Island area, and W from the Quebec side of the bay during the first half of July and to be concentrated between Cape Churchill, the Belchera Islands, and the Ottawa Islands when the normal navigation season opens on July 23. At this stage, there is usually a shore lead from Churchill to James Bay, and the offshore pack is extensive; it is puddled and approaching the rotten stage.

In August, the ice-covered area continues to contract and the pack will often separate into a few large patches before melting completely in the latter half of the month.

Intrusions of ice from Foxe Basin may develop in the NE sector at any time from late August until freeze-up. This occurrence depends upon the melt season in Foxe Basin and the wind flow during August. In most cases, the ice remains in the Leyson Point to Nottingham Island area, with a few strips

penetrating W into Evans Strait. In these cases the shipping route may be adjusted to pass S of Mansel Island instead of S of Coats Island, for the warm outflowing waters from the S part of the bay keep this channel clear and hasten the melting of any ice. In extremely bad years, the ice can reach the Quebec shore and cause congestion once freeze-up approaches.

Tides—Currents

15.4 In a body of water the size of Hudson Bay, the tide rising forces due to the gravitational attraction of the sun and moon would certainly result in a small tide of the order of a few millimeters even in the absence of any connection with the ocean. In addition, the connection with the Arctic Ocean by way of Foxe Channel, Fury Strait, and Hecla Strait would also have some effect, however small, on the tide and tidal current regime of Hudson Bay. In fact, these minor effects are completely overshadowed by the powerful tides which surge twice daily into the bay through Hudson Strait.

Owing to the shape, size, and depth of water in Hudson Bay and the gyroscopic and gravitational forces acting upon the water masses, there is what may be referred to as a ridge on the surface of the water in the middle of the bay, where any changes which occur in the water level during the semidiurnal tide cycle are small. This ridge extends from 60˚30'N, 87˚00'W SE toward Inukjuak (Port Harrison).

Within the boundaries of this ridge, the rise and fall of the tide is close to zero while around the coast of the bay the range in height between HW and LW may be as great as 5.2m at Churchill Harbor, and as little as 0.5m at Inukjuak.

The tide progresses in a roughly circular movement, following the contour of the shoreline starting from the NW part of the bay, moving S along the W shore and almost diminishing entirely along the E shore. At the entrance to the bay, the average height of the tide above chart datum (a level below which the tide seldom falls) is 3.1m, increasing to 4.1m along the W shore. It decreases gradually along the S shore and then along the E shore to about 0.5m at Inukjuak.

High water at the entrance to the bay will occur at the same time as LW at Rankin Inlet, while HW at York Factory will take place at the same time as LW in the vicinity of the Belcher Islands.

The rotary progression of the tides around Hudson Bay has corresponding tidal currents associated with it, and the flow in Hudson Bay has been observed by the early explorers of the bay.

Unfortunately, the tidal currents are as yet insufficiently known. It is possible however to say that they are strongest in the W part of the bay, while in the vicinity of Povungnituk and Inukjuak they are weak and irregular. Both tides and tidal currents are closely related and the shape of the N part of the bay and its orientation relative to the mouth of the strait suggests that the flow would be predominately counterclockwise. This is actually observed to be the case.

The actual flow encountered in the bay is not exclusively tidal, but is influenced by the numerous rivers which discharge large quantities of fresh water into Hudson Bay. Since the volume of the rivers is subject to large seasonal variations, this will have an influence on the flow which is not precisely predictable. The flow, like the tides, is also influenced by meteorological disturbances, in particular by the strong winds which are often encountered in the bay.

The tidal currents at Chesterfield Narrows are strongly influenced by the fresh water outflow from Baker Lake. Slack water occurs before and after a prolonged HW period. The flood is characterized by a maximum W flow of about 4.5 knots for about 4 hours. The ebb flow, which reaches a maximum velocity of about 7 knots at LW, lasts some 8 hours. The current is reversing with maximum velocities at HW and LW, respectively.

Pointe Nuvuk to Cape Dufferin

15.5 The N section of the E shore of Hudson Bay lies between Pointe Nuvuk and Cape Dufferin, about 230 miles to the S. The coast is low, with rounded hills about 61m high. Inland, the gradually rising plain is broken by long rocky ridges. From Cape Smith, about 102 miles S of Pointe Nuvuk, the coast is fronted by numerous small islands. The shores are rocky at the points and the bays are fringed with sand and boulder-strewn beaches.

Depths—Limitations.—East of a line connecting Pointe Nuvuk, Cape Smith, and Cape Dufferin, the soundings are extremely sparse. Shallow water extends a considerable distance offshore, and the uneven bottom makes navigation very hazardous, even for small craft.

From Pointe Nuvuk to Kovik Bay, 43 miles to the S, the coast is low and fairly regular, with no outstanding features.

Ice Harbor (62˚18'N., 78˚08'W.) lies 3 miles S of Pointe Nuvuk. Foul ground obstructs its entrance and a drying flat extends offshore from its head. Depths in the harbor are not known.

Peck Inlet is separated from Ice Harbor by a narrow neck of land. The long narrow inlet is entered from the S and extends NNE parallel to the coast. Drying rocks obstruct the entrance which lies 3.5 miles S of Ice Harbor. Anchorage is available at the head of the inlet, in 9m, for small vessels familiar with the area.

15.6 **Kovik Bay** (61˚34'N., 77˚44'W.), entered about 45 miles SSE of Peck Inlet, is encumbered with islands and shoals. Riviere Kovik flows into the head of the bay. Pointe Bernier is a low flat point at the S entrance of Kovik Bay.

Kettlestone Knob (Pointe du Profond) (61˚12'N., 77˚45'W.), 18 miles S of Kovic Bay, is a conspicuous hill, 15m high, lying 0.5 mile offshore at the seaward end of a neck of boulders. Another conspicuous hill, the highest in the immediate vicinity, rises to a height of 64m, 4.5 miles NE of Kettlestone Knob.

Kettlestone Bay, an open bight, is entered close S of Kettlestone Knob. Small craft, familiar with the area, shelter in the mouth of a small river which flows into the head of the bay.

Pecten Harbor, a small circular inlet, partially protected by a ridge of boulders, lies 12 miles S of Kettlestone Knob.

Cape Smith (60˚43'N., 78˚43'W.), the W extremity of Smith Island, lies 32 miles SW of Pecten Harbor. From seaward, the island appears as a rugged mass of dark green to black rock. It is a prominent landmark. The island is 16 miles long and 4 miles wide, with elevations of 244 to 305m. It is separated from the Cape Smith Range by a channel 1 mile wide, which is

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so encumbered with rocks and shoals that only small craft can navigate it.

15.7 Smith Island (60˚44'N., 78˚30'W.) (World Port Index No. 1150) is the site of a former Hudson's Bay Company post situated in a small cove on the S side of Smith Island, about 9 miles E of Cape Smith. The island is a good radar target.

Ice.—In some late seasons, the waters around Smith Island are not entirely free of ice until the third week in July, and in some years the ice never completely leaves the area. Freeze-up has arrived late in September, but generally it is 1 month later.

Anchorage.—Some fairly good anchorages are available on the S side of Smith Island, but they afford little or no protection to large vessels from S winds.

Small vessels can anchor within the cove at the site of the abandoned Hudson's Bay Company post. Larger vessels must anchor about 1 mile off the entrance.

Babs Bay (60˚45'N., 78˚20'W.), about 6 miles ENE of the abandoned post, is entered from the E. A small brook flows into the head of the sheltered bay. The sand and gravel beach at the mouth of the stream affords good landing for boats.

15.8 Between Cape Smith and Cape Dufferin, about 125 miles to the S, the low marshy coast is full of bays and fringed with islands and shoals. The shoreline recedes nearly 40 miles forming a bight with Povungnituk Bay at its head. The Ottawa Islands lie about 70 miles offshore between Povungnituk Bay and Cape Dufferin.

The **Cape Smith Range** (60˚50'N., 78˚00'W.), a chain of snow-topped hills lying in a NE-SW direction, extends inland from the W end of Smith Island. The range appears as sharp, narrow parallel ridges of dark green rock with heights of 91m to 305m. Rising as they do from the nearly flat country which surrounds them, the hills are a prominent landmark.

Knight Harbor (60˚48'N., 78˚04'W.), located 4 miles E of Babs Bay, extends inland for 5 miles. It is reported to afford good anchorage, but has not been thoroughly examined. Uncharted shoals may exist in the area.

Ile Gobin, 1.5 miles long, 1 mile wide, and 31m high, lies close-off the entrance to Knight Harbor.

Mosquito Bay (60˚40'N., 78˚00'W.) lies between the SW point of Smith Island and Pointe Demers (Agnes Smith Point), 15 miles to the SE. The E side of the bay is broken by several narrow inlets.

Korak Bay, located in the SE part of Mosquito Bay, is encumbered with islands and reefs. Low rounded hills form the S shore and the Korak River flows into the head of the bay.

15.9 Neakongut Bay (60˚30'N., 77˚40'W.) is entered between Pointe Demers and Pointe Cusson (Magnet Point), about 16 miles to the S. Numerous islands and rocks encumber the bay. At the head of the bay an arm, about 1 mile wide, extends inland for 5 miles to the mouth of the Sorehead River.

From Pointe Cusson, a low flat point, to Pointe Dufrost (Cape Anderson), 20 miles to the SSE, the shoreline recedes to form a bight which is obstructed by many rocks and islands.

Magnet Island (60˚16'N., 77˚38'W.) lies 8 miles SSE of Pointe Cusson and forms part of the N entrance of Thompson Harbor. Two other unnamed islands lie across the entrance.

Pointe Coutlee (Cape Margaret), 8 miles S of Magnet Island, and Pointe Dufrost, 3 miles farther SW are the W extremities of a peninsula forming the N side of Povungnituk Bay.

A group of three islets, reported to be radar conspicuous, lie within 7 miles NW and 9 miles WNW of Pointe Coutlee. A rock, awash, lies about 5.5 miles W of Magnet Island.

Caution.—A local magnetic anomaly exists in the vicinity of Magnet Island.

15.10 Povungnituk Bay (60˚00'N., 77˚20'W.) is entered between Pointe Dufrost and Pointe aux Ecueils (Reef Point), about 21 miles to the S. The bay extends inland for 10 miles to the mouth of the Povungnituk River. Numerous low-lying islands fringe the shores of the bay which is heavily encumbered with rocks, shoals, and drying reefs.

North Kopak Island and **South Kopak Island** (60˚00'N., 77˚45'W.) lie 4.7 miles SW of Pointe Dufrost. A beacon with a radar reflector is situated on the SW side of South Kopak Island.

Long Reach Island (59˚58'N., 77˚39'W.) lies on the E edge of a foul area that extends SE for 3 miles from the Kopak Islands. A depth of 1.5m lies 1.5 miles SSW of Long Reach Island, while a depth of 5.4m lies 2.5 miles SW of the island.

South Island (59˚58'N., 77˚33'W.) lies 3 miles ESE of Long Reach Island. Heavy breakers have been reported 1.2 miles S of this island.

Rock Island, located 1 mile ENE of South Island, has depths of 1m located 0.3 mile to the S.

Inooksulik Island (59˚59'N., 77˚27'W.) is located 2.2 miles NE of Rock Island; **Innelatevik Island** (60˚01'N., 77˚23'W.) lies 2 miles farther NE.

The **Povungnituk River** (60˚00'N., 77˚20'W.) is entered between Big Finger Point. The river, one of the largest flowing into the E side of Hudson Bay, rises in the foothills of the Povungnituk Range. Conspicuous boulders mark each side of the mouth of the river. The approaches to the entrance are congested with depths of less than 1.8m and a depth of 0.3m lies 0.15 mile N of Fish Point, the S entrance point to the river.

15.11 Povungnituk (60˚02'N., 77˚16'W.) is a settlement situated on the N bank of the river, 2 miles inside the entrance. It consists of Anglican and Roman Catholic Missions, a post office, a school, a nursing station, and a Hudson's Bay Company store.

Both the Roman Catholic mission and the Hudson's Bay Company store have radiotelephones in contact with the Coral Harbor (VFU) and Inukjuak (VAL) radio stations.

Ice.—Freeze-up takes place about late October or early November; break-up occurs in late June. Once break-up has started, the strong current in the river quickly clears the ice.

Tides—Currents.—The tidal range varies with wind force and direction. Winds from the SE decrease the tidal range, while SW winds will increase it.

Depths—Limitations.—There is a least depth of 7m in the channel leading to the settlement.

Pilotage.—Arrangements for a pilot can be made through a Canadian Coast Guard radio station. Twenty four hours notice is required. Vessels are advised to enter only during daylight hours with the assistance of a local pilot. The low-lying land in

the approaches does not give a good radar return and the approaches are heavily encumbered with shoals.

Anchorage.—Anchorage has been obtained with South Island bearing 015˚, 3 miles distant, in 30m, good holding ground, poor shelter. Restricted anchorage can be obtained 0.15 mile E of Fat Island, which lies 0.3 mile S of the settlement, in a depth of 7m, rock and hard sand, poor holding ground.

15.12 Shallow Bay (59˚49'N., 77˚24'W.) and Reef Bay, on the S side of Povungnituk Bay, are reported to be shoal and congested by numerous islands.

For about 15 miles S from Pointe aux Ecueils, the shore is low. The water is shoal and filled with reefs which extend well out from the shore. Landing along this stretch of coast is almost impossible.

Pointe Boucher (Cape Alice) (59˚38'N., 77˚50'W.), 5 miles S of Pointe aux Ecueils, forms the N entrance point of Shoal Harbor, a small inlet almost completely filled with rocks and islets.

Pointe Bourjoli (Cape Gertrude) (59˚24'N., 77˚58'W.), a broad low peninsula 14 miles SW of Pointe Boucher, is connected to the mainland by a narrow isthmus which forms the N side of Kogaluk Bay. The bay is filled by numerous small islands.

The Checkered Islands, a chain of four islands, extends W for 2 miles from Pointe Bourjoli.

Pointe Despins (Cape Donald) (59˚10'N., 78˚10'W.), 16 miles SW of Pointe Bourjoli, is the N entrance point of Mistake Bay, a small inlet almost completely filled by islets.

The Riviere Koktac flows into Hudson Bay close S of Mistake Bay.

Between Mistake Bay and Alle Harbor, 17 miles to the SW, the irregular shore line is fronted with numerous islands which, in places, extend several miles offshore.

Alle Harbor (58˚50'N., 78˚34'W.) is a narrow inlet obstructed by islands and rocks.

Staffe Island and Inman Island form the W side of Alle Harbor. Commodore Island lies close W of Staffe Island, numerous small islands and islets extend S and SE of it.

Elsie Island (58˚50'N., 78˚56'W.) lies 7 miles NW of Commodore Island. It is the largest island in the chain of islands about 16 miles long in an NNW-SSE direction and over 61m high. There is a good harbor for small boats in the middle of the W side of the island, with 4.6m of water in the entrance and 11m inside the harbor. A small wedge-shaped island, 20m high, lies 6 miles W of Elsie Island.

Peckham Island and Komaluk Island lie about 3.5 miles SW of Commodore Island, at the SE end of the chain.

Portland Promontory (58˚41'N., 78˚34'W.), about 10 miles S of Alle Harbor, terminates in a peninsula connected to the mainland by a narrow neck. It is surrounded by a group of large rocky islands. Small rock-filled bays form the irregular shore line.

Pointe Nuvuk to Cape Dufferin—Off-lying Islands

15.13 Mansel Island lies 35 miles offshore between Pointe Nuvuk and Kovik Bay. It is described in paragraph 16.3.

The Ottawa Islands, the N group of islands lying off the E coast of Hudson Bay, consists of nine principal islands and numerous rocks and islets. The islands lie in a NE-SW direction, about 65 miles off and parallel to the coast. The N end of the group lies 65 miles off Pointe aux Ecueils. In appearance, the islands are bare and mountainous, formed of masses of black volcanic rock, rising as high as 335m.

Bronson Island (59˚58'N., 79˚50'W.), at the N end of the group, is a narrow island 3.5 miles long, 0.5 mile wide, and 122m high. A small island lies close off its S end and a larger island 61m high, lies 1 mile SE of the same point.

Booth Island, 1 mile SW of Bronson Island, is 2 miles long, 1 mile wide, and 152m high.

Gilmour Island (59˚50'N., 80˚00'W.), the largest of the Ottawa Islands, lies 2 miles SW of Booth Island. Mount Allan, its highest peak located in the NE part of the island, is 344m high.

Murray Harbor, on the SW side of Gilmour Island, extends inland about 4 miles, with an average width of 1 mile.

Perley Island (59˚40'N., 80˚15'W.), located 2.5 miles SW of Gilmour Island, is 7.5 miles in length with an average width of 2 miles. The summit, near the SE end of the island, is 226m high.

Pattee Island (59˚40'N., 80˚26'W.) lies 2.5 miles W of Perley Island. It is 5 miles long, 0.5 mile wide, and 131m high at its N end. Several coves indent the E side.

J. Gordon Island (59˚40'N., 80˚34'W.), 2 miles W of Pattee Island, is irregular in shape and 122m high. A small island and two islets lie 1 mile to the SW.

A chain of small islands, 25 miles in length, extends SSW from a point 3.7 miles SE of Perley Island.

15.14 Eddy Island (59˚27'N., 80˚28'W.), the largest in the chain, is a narrow island 6 miles long and 152m high. It lies 9 miles SSW of Perley Island.

House Island (59˚19'N., 80˚40'W.), a narrow island 3 miles SSW of Eddy Island, is 71m high. A small group of islands and islets lies 5 miles E of the S end of Eddy Island. A similar group lies 4 miles W of the same point.

An island, 61m high and fringed with rocks on its W side, lies 5 miles SE of House Island.

Waters Island (59˚03'N., 80˚41'W.) is the central island of a group, lying 12 miles S of House Island. This island is 66m high. A larger island at the N end of the group is 119m high.

A small island, 37m high, and two smaller islets lie in position 58˚52'N, 80˚31'W.

Farmer Island (58˚24'N., 80˚48'W.), a small barren and rocky island, has a small bay sheltered by several islets on its NE side, but little is known of the depths in the vicinity. A tower fitted with a radar reflector is situated on Farmer Island.

Two islets are charted 10 miles S of Farmer Island; two other islets (position approximate) lie 32 miles SE of the same island.

Tides—Currents.—Currents along the E side of Mansel Island are reported to have a dominant set to the S.

A strong NE set has been reported between Cape Smith and Povungnituk. From Pointe aux Ecueils to Elsie Island, 60 miles to the SW, there is a constant N current; in the passage between Cape Smith and the Ottawa Islands, the current sets NW.

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Caution.—The area in the vicinity of the Ottawa Islands has not been surveyed. Caution should be exercised if attempting to approach them.

Cape Dufferin to Pointe Louis XIV

15.15 Between Cape Dufferin and Pointe Louis XIV, 250 miles to SSW, the coast recedes to form a large semicircular bight. A chain of islands, commencing about 54 miles SW of Cape Dufferin, extends S for about 42 miles. The Marcopeet Islands (described beginning in paragraph 15.29) lie at the N end of the chain, while the South Sleeper Islands (described beginning in paragraph 15.29) lie at the S end. The King George Islands (described beginning in paragraph 15.29) lie to the E of the South Sleeper Islands, about midway between them and the mainland. The Belcher Islands, a group of large islands (described beginning in paragraph 15.30), lie S of the Sleeper Islands.

The mainland shore is backed by high bold land with heights of 305 to 610m. A line of islands, the Hopewell Islands and the Nastapoka Islands, lie close off and parallel to the mainland shore. These islands extend from Cape Dufferin to Richmond Gulf, about 170 miles to the S and, except for a 40 mile gap in the vicinity of the Kikkerteluc River, form a sheltered inside passage for small coastal vessels.

Depths—Limitations.—Soundings are sparse or completely lacking between the islands and the coast.

An area of discolored water, 4 to 5 miles in extent, with a depth of 12.8m, lies about 19 miles offshore, 28 miles S of Cape Dufferin.

15.16 The Hopewell Islands extend about 50 miles in a SE direction from Cape Dufferin to Pointe Normand. The long, narrow islands lie close off and parallel to the mainland coast, which is high and rocky, with sharp granite hills rising to 152m. On their E sides the larger islands have steep, but often broken cliffs. The W sides slope gradually to the shore line. The islands vary in size and height within maximum elevations of about 61m.

Hopewell Sound, the passage between the islands and the mainland, varies in width. At Hopewell Narrows it is only 18m wide and obstructed by large boulders.

Depths—Limitations.—That part of the sound that has been surveyed, between Murray Island and Harrison Island, indicates depths in mid-channel of 21.9 to 40.2m. Deep water lies off the steep E sides of the islands; off the mainland shore the water is shoal up to a distance of 0.5 mile.

Moore Island (58˚33'N., 78˚34'W.), the N island in the Hopewell Islands, lies close SE of McCormack Island. It has an elevation of over 31m in its central part. An islet, 1.2m high, existence doubtful, was reported in 1978 to lie 2 miles WSW of the S end of Moore Island.

Yound Island (58˚30'N., 78˚23'W.), 4 miles SE of Moore Island, is 44m high.

North of Young Island, the mainland coast is broken by Witch Bay. Bates Peninsula forms the W shore of the bay.

Five Mile Inlet (58˚32'N., 78˚18'W.), 4 miles SE of Witch Bay, affords good anchorage for small craft in a small bay on the SE side of its entrance.

Murray Island (58˚29'N., 78˚21'W.), close SE of Young Island, is 37m high. The narrow passage between the islands is foul.

Depths of 0.6m lie in mid-channel in Hopewell Sound between Murray Island and Five Mile Inlet.

Kit Island, a small islet close SE of Murray island, is only 15m high.

15.17 Patterson Island (58˚26'N., 78˚15'W.) is 3.3 miles long and 42m high. A breaking shoal extends NW for 0.3 mile from the NW end of the island. Between the island and the nearest point on the mainland, the navigable channel is narrowed to 0.2 mile by a shoal extending from the mainland. A beacon is situated on the SE end of the island.

Bluff Island (58˚25'N., 78˚09'W.), a flat-topped islet with conspicuous dark cliffs, 34m high, lies 0.3 mile E of the SE end of Patterson Island. A conspicuous rock is located on the W end of the islet.

Harrison Island (58˚23'N., 78˚10'W.), the largest island in the Hopewell Islands, is 5 miles long and 1.5 miles wide. Palisade Cliffs, 93m high and prominent, are located near the middle of the N shore. From the cliffs, the island slopes gradually to its SW side, off which the water is shoal.

Algerine Channel, the passage between Patterson Island and Harrison Island, is 1 mile wide. Depths in the W entrance range from 20.1 to 27.4m and deepen to 54.9m through the remainder of the channel.

Breaker Shoal, on the N side of the channel about 0.4 mile SW of the SE end of Patterson Island, is an extensive shoal with a least depth of 3m. The shoal breaks heavily in a moderate sea.

Fairway Island (58˚25'N., 78˚16'W.) is 4m high. It is the W of the three islands lying close off the NW end of Harrison Island. Shoal water extends W and N of the island. A depth of 0.6m lies 0.1 mile N of the W end of the island. A 6.4m patch lies 0.6 mile SW of the island.

Hopewell Narrows (58˚23'N., 78˚07'W.), between Harrison Island and the mainland, is partially blocked by boulders. The passage is only 18m wide.

Sheep Island (58˚26'N., 78˚08'W.), lying 0.8 mile NE of Bluff Island, is a bare rocky island, 17m high.

15.18 Inukjuak (58˚28'N., 78˚06'W.) (World Port Index No. 1140), formerly called Port Harrison, is situated on the W bank of the Innuksuac River, a clear, fast flowing stream with a velocity of about 4 knots, which flows into Hopewell Sound about 2 miles NE of Bluff Island. There is a series of rapids about 1 mile upstream from the settlement, where the river is confined between rocky hills.

Inukjuak consists of a Hudson's Bay Company store, an Anglican Mission, anursing station, a government radio station and meteorological station, a post office, and an RCMP detachment.

Ice.—Break-up usually occurs about mid-June. The river is generally clear of ice by the last of June. Freeze-up begins about the end of October; it is usually completely frozen by mid-November or the first week of December.

Aspect.—The dome of the meteorological station on the E bank of the river opposite the radio station has an elevation of

23m and is conspicuous. A cairn, 1.3 miles E of the settlement, is also conspicuous.

Pilotage.—A pilot can be obtained by contacting the Hudson's Bay Company store through the Coast Guard radio station.

Anchorage.—Anchorage can be taken 0.3 mile E or 0.5 mile SW of the E end of Sheep Island, in 25.6m, heavy clay. This anchorage is open to winds out of the S. Anchorage can also be obtained, in 20.1m, clay, N of Sheep Island.

Directions.—A course of 110˚, with the cairn on Palisade Cliffs on Harrison Island dead ahead, leads through the Algerine Channel. When the beacon on the SE point of Patterson Island is abeam to port, course should be altered to 070˚. After passing Bluff Island, proceed to the anchorage. Caution must be exercised to avoid Breaker Shoal in the W part of Algerine Channel.

15.19 The **Kongut River** (58˚23'N., 78˚05'W.) flows through silted flats into Hopewell Sound, 1.5 miles NE of Hopewell Narrows.

Fraley Island (58˚20'N., 78˚05'W.) lies close SE of Harrison Island. A narrow passage, 0.1 mile wide and over 11m deep, separates the islands. Fraley Island is over 30m high on its NE side.

The rest of the islands in the Hopewell Islands include Frazier Island, Drayton Island, Leonard Island, and Bartlett Island. All are similar in character, with high E sides and maximum elevations ranging from 31 to 61m.

Hotchkiss Island lies E of Leonard Island close to the mainland shore.

Caution.—A group of four islands lie about 19 miles WSW of Bartlett Island. A rocky depth of less than 1.8m is located 4 miles WNW of the islets; an area of discolored water with a reported depth of 12.8m lies 10 miles farther to the NW.

Pointe Normand (58˚10'N., 77˚32'W.) is located on the mainland E of Bartlett Island, the S of the Hopewell Islands. Between Pointe Normand and Pointe Pamialluk, 49 miles to the SE, the coast is rugged and rocky, rising to heights of 122 to 244m of 3 miles inland.

Landlocked Harbor (58˚00'N., 77˚12'W.), 14 miles SE of Pointe Normand, is formed by the widened mouth of the Kikkerteluc River. It is reported to afford good, sheltered anchorage.

15.20 Bell Harbor (57˚56'N., 77˚08'W.) lies 5 miles SE of Landlocked Harbor. Little is known concerning its anchorage possibilities.

Nastapoka Sound, the protected passage between the Nastapoka Islands and the mainland, is about 106 miles in length, with an average width of 2 miles. The sound extends from Cotter Island in the N to Flint Island at its S end. There are depths of 12.8 to 20m charted in its middle section. Between Curran Island and Luttit Island, mid-channel depths in Nastapoka Sound generally vary between 46m and 92m.

From the N, the sound may be entered between Cotter Island and the mainland or through the 1-mile wide channel between Davieau Island and Christie Island. Other channels exist between several of the other islands.

The preferred passage through the Nastapoka Islands to Umiujaq lies between Clarke Island and Luttit Island. The channel is 1.8 miles wide and has a least depth of 19.5m. Approach to the passage may be made on a course of 088˚, passing a little less than 1 mile N of Luttit Island and SE of a 12.8m patch lying almost 1 mile S of Clarke Island. From a position sufficiently clear of Clarke Island, a N course may be shaped to pass midway between Clarke Island and the mainland, and this course maintained to Umiujaq.

The land backing the sound is high and rugged, with elevations of 305 to 457m.

The Nastapoka Islands, 65 in number, extend S along the mainland shoreline in a chain. In general, the islands are similar in formation in that they all have steep and broken cliffs on their E sides, with deep water close inshore. The W sides slope gradually to the sea, with shoal water and reefs extending some distance offshore. Large vessels should stay off the W sides of the Nastapoka Islands.

15.21 Cotter Island (57˚46'N., 77˚01'W.), the N island in the Nastapoka Islands, lies 2 miles off the mainland. It is 61m high. From a distance it appears as two islands, bold at each end and low in the middle. There are no harbors on the island.

McTavish Island (57˚32'N., 76˚54'W.), 11 miles SSE of Cotter Island, is 61m high on its E side. A small island lies close NW of McTavish Island.

Broughton Island (57˚20'N., 76˚46'W.), 4 miles SSE of McTavish Island, is the largest in the chain and rises to a height of 122m. Shelter is available in two small bays on the E side near the N end, and also in two small bays on the E side at the S end of the island. Two small islets lie off the entrance to the S bays.

The **Longland River** (57˚28'N., 76˚44'W.) flows into Nastapoka Sound 4 miles NE of the N end of Broughton Island. The bar at the river entrance has depths of 1.2m and the small basin inside is filled with shoals.

Nicholson Island (57˚15'N., 76˚45'W.) lies close S of Broughton Island. There is a good boat harbor, protected by a small island, on its E side about 1.5 mile from the S end.

Davieau Island (57˚08'N., 76˚40'W.) lies close S of Nicholson Island, the narrow passage between the islands is encumbered by small islets. Several bays indent the E side of Davieau Island, which rises to a height of more than 61m There is no anchorage for large vessels, but a small bay near the S end of the island is reported to afford shelter for small craft.

Christie Island (57˚01'N., 76˚41'W.), 1 mile S of Davieau Island, is 91m high along its E side. A good harbor for small craft is located at the S end of the island in the lee of a long sandy spit.

The Throat (57˚04'N., 76˚41'W.) is the 1-mile wide channel separating Christie Island and Davieau Island. Large vessels can enter Nastapoka Sound through this passage.

15.22 Mowat Island (56˚58'N., 76˚40'W.) is separated from Christie Island by a deep but narrow 90m channel. A chain of small islands extends S from Mowat Island for about 3 miles. A small harbor has been reported on the N side of the island.

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In 1973, two rocky depths of less than 1.8m were reported about 3.5 miles SW of Mowat Island. A 0.9m shoal lies about 1.8 miles E of the island.

The Nastapoka River flows into the sound about midway between Mowat Island and Gordon Island. Nastapoka Falls, located close to the river mouth, has a vertical drop of 31m. Drying rocks are reported to lie about 1.5 miles offshore close N of the river mouth and 0.6 mile offshore about 1.5 miles NE of the river mouth. Other undetected dangers may exist in this vicinity.

Gordon Island (56˚52'N., 76˚40'W.), one of the smaller islands in the chain, lies 4.5 miles S of Mowat Island. It is less than 61m high.

Taylor Island (56˚44'N., 76˚40'W.) lies 5.5 miles S of Gordon Island. A bay, 0.5 mile wide and 1 mile long, on the E side of the island, affords a safe harbor. Two small islands which lie S of the NE entrance point of the bay form a small bay and a good harbor.

Gillies Island (56˚38'N., 76˚36'W.), close S of Taylor Island, is a narrow island, 13 miles long, with numerous bays on its E and W sides. A small bay on the E side, about 1 mile from the S end of the island, is the best harbor. The SE part of the island is over 61m high. Recent survey has indicated that depths over the shoals in the vicinity of Gillies Island are less than charted.

Clarke Island (56˚27'N., 76˚39'W.) lies 4 miles S of Gillies Island. Curran Island and Armstrong Island, two small islands, lie between them. Three islets lying close off the cliffs on the E side of the island form a good harbor. This side of the island has heights in excess of 61m. Two low gravel islands, scattered with large boulders and joined by a bar, lie off the SW point of Clarke Island.

Umiujaq (56˚33'N., 76˚33'W.), an Inuit village, lies on the mainland E of the S end of Gillies Island. A low-lying rock point juts out into Nastapoka Sound. North and S of the village there are low sloping sandy beaches.

Anchorage may be obtained 0.3 mile offshore opposite the rocky point, in 29m, sandy bottom, good holding ground. A weak tidal current, with a velocity of about 0.4 knot and variable in direction, has been recorded at the anchorage.

15.23 Luttit Island (56˚22'N., 76˚42'W.) is a small island 3.5 miles S of Clarke Island. Several reefs lie in the intervening passage. A group of islands and shoals are located 14 miles W of Luttit Island.

Anderson Island (56˚18'N., 76˚42'W.) is separated from Luttit Island by a narrow passage which is only 0.1 mile wide at its narrowest part. The E and SE sides of the island are steep and rugged with heights to 122m. Near the middle of the E side the cliffs terminate abruptly and the shoreline trends sharply W forming a bay which is nearly landlocked by two small islands. The bay affords good anchorage. The W shore of Anderson Island is low and sandy, with a few rocky points and extending reefs.

Ross Island (56˚13'N., 76˚46'W.), 2 miles S of Anderson Island, is a crescent-shaped island about 122m high.

Belanger Island (56˚08'N., 76˚46'W.) lies 1 mile S of Ross Island and 2 miles off the mainland opposite the entrance to Richmond Gulf. Strong tidal currents occur in the passage between Ross Island and Belanger Island. The E side of the island is over 122m high, with deep water close inshore. The W side is low, with reefs and shoal water extending seaward for a considerable distance.

Flint Island (56˚04'N., 76˚48'W.), a small rocky island, lies 1.2 miles SW of Belanger Island. It is the southernmost island in the Nastapoka Islands.

A long, low reef, which breaks, lies about 6 miles SSW of Flint Island.

15.24 Lac Guillaume-Delisle (Richmond Gulf) is a large triangular-shaped body of water separated from Nastapoka Sound by a long rocky ridge over 305m high. Its length N-S is 26 miles and its maximum width is about 25 miles. Numerous bays break the steep and jagged shore, which is backed by hills rising 152 to 305m.

Cairn Island, 183m high, is the largest of the many rocky islands in the gulf. The tree line begins a few miles N of Lac Guillaume-Delisle and the islands in the gulf are wooded.

Le Goulet (Gulf Hazard) (56˚10'N., 76˚40'W.), the narrow entrance channel leading from Nastapoka Sound into Lac Guillaume-Delisle, is 6 miles long, but only 0.15 mile wide between the steep shores which rise to heights of 31 to 305m. Strong tidal currents create whirlpools in the passage which is dangerous for small craft except at SW.

Castle Peninsula, the N side of Le Goulet, is 305m high. A prominent peak, 3 miles N of Castle Peninsula, is 379m high. Another peak, 4.5 miles S of the peninsula, is 446m high.

The **Petite Riviere de la Baleine** (Little Whale River) (56˚00'N., 76˚46'W.) flows into Hudson Bay about 11 miles SSW of Le Goulet. The high, bold hills inland rise to 305m close S of the river. Depths of 1.8m are reported over the bar at the mouth of the river;there is a depth of 6.1m inside the bar. A drying rock lies 5 miles WSW of the N side of the river mouth.

Between the Petite Riviere de la Baleine and the Grande Riviere de la Baleine, 55 miles to the SW, the generally regular coastline is fronted by the Manitounuk Islands. Manitounuk Sound separates the islands from the mainland.

Duck Island (55˚46'N., 77˚12'W.) lies 3 miles off the mainland, 20 miles SW of the Petite Riviere de la Baleine. It is a low marshy irregular-shaped island. The harbor on its SW side is open and offers little protection.

The Manitounuk Islands, a chain of long, narrow islands, extend generally parallel to and from 1 to 2 miles off the mainland coast for a distance of 27 miles. These islands are similar in appearance to those in the Nastapoka group, with high cliffs on their E sides. Castle Island, Merry Island, Neilsen Island, and Bill of Portland Island are included in the group.

Gillies Island (55˚20'N., 77˚52'W.), a small island 3.8 miles SW of Bill of Portland Island, is only 4.9m high and has a spit with a depth of 8.2m extending 0.4 mile SW. Depths of 11m or less are reported to exist 1 mile SW, 2.5 miles N, and 3.8 miles NNW of Gillies Island.

15.25 Manitounuk Sound lies between the Manitounuk Chain and the mainland. The mainland shore is backed by hills which rise close inland to heights of 244m. Offshore, shoal water extends 0.3 mile seaward from the coast.

Mid-channel depths in the sound range from 54.9 to 73.2m.

From the N, Manitounuk Sound can be entered through Boat Opening, which is shallow, or through Schooner Opening, with a reported depth of 7.3m.

The **Paint Islands** (55˚30'N., 76˚35'W.) are a chain of small islands lying close off the mainland shore opposite the central part of Merry Island.

Laverock Bay (55˚24'N., 77˚41'W.) is located on the E side of Neilsen Island.

Anchorage.—Anchorage can be taken, in 21.9m, sand and mud, 0.1 mile NE of the white boulders on the S side of the bay. The anchorage is open to E winds. A conspicuous boulder on the NE end of the ridge on the N side of Laverock Bay is a good landmark.

The **Maver Islands** (55˚20'N., 77˚44'W.), two small islands, lie 2 miles S of the SW end of Bill of Portland Island.

15.26 The **Grande Riviere de la Baleine** (55˚16'N., 77˚47'W.) flows into Hudson Bay, 6 miles S of Bill of Portland Island. The entrance is 0.2 mile wide between Sandy Point, the N entrance point of the river, and the S shore. At LW there are depths of 0.6m on the bar, at springs a draft of 2.7m can be carried over the bar and for 5 miles upstream. With any swell the bar becomes an area of breaking, confused water.

Poste-de-la-Baleine (55˚16'N., 77˚46'W.) is situated on the N shore of the river about 1 mile E of Sandy Point. The settlement consists of a Hudson's Bay Company store, a post office, a nursing station, Anglican and Roman Catholic missions, and an administrative building.

Ice.—Freeze-up usually begins between November 10 and November 20. Breakup starts around the last part of May, and the area is generally clear of ice by the first week in June. The average ice thickness is 1.4m.

Tides—Currents.—Heights of tides are influenced by wind direction and velocity. Spring tides are reported to rise 2.4m. Neap tides rise 1.8m.

The river current varies from 1.5 to 2 knots. Offshore currents usually set N. Currents are reported to be strong off the SW end of Bill of Portland Island.

Aspect.—An airstrip, with a conspicuous hanger and several conspicuous radio masts, lies close N of the settlement and the oil storage tanks on Sandy Point are conspicuous.

Anchorage.—Anchorage can be taken with Sandy Point bearing 110˚, distant 1.2 miles, in 31.1 to 34.7m, mud. With W gales, shelter is afforded in Laverock Bay, 8.5 miles NNE of Sandy Point. During bad weather it may not be possible to anchor in Manitounuk Sound, and it is recommended that vessels remain offshore. It is not advisable to anchor off the Grande Riviere de la Baleine if winds exceed force 5.

Directions.—Vessels bound for Poste-de-la-Baleine along the E side of Hudson Bay will find deep water 5 to 10 miles to seaward of the Nastapoka Islands and Manitounuk Islands. An inside track may also be taken through Nastapoka Sound and Manitounuk Sound in mid-channel depths of 20.1m; however, the limiting depths in Boat Opening and Schooner Opening at the N end of Manitounuk Sound should be kept in mind.

Vessels leaving Omarolluk Sound in the Belcher Islands should steer a course of 115˚ in a least depth of about 18.3m.

If a course through Hudson Bay W of the Belcher Islands is followed, vessels should commence from position 55˚15'N, 80˚15'W, then steer a course of 089˚ to the entrance of the Grande Riviere de la Baleine in least depths of 11 to 14.6m.

15.27 Between the Grande Riviere de la Baleine and Pointe Louis XIV, 82 miles to the SW, the generally regular coast has only a few minor indentations with no sheltered anchorages. Shallow water and shoals may exist in the vicinity of the islands along this low-lying section of the coast.

Black Whale Harbor (55˚09'N., 78˚07'W.) is a small indentation in the coast, 14 miles SW of the Grande Riviere de la Baleine.

Otaska Harbor (55˚04'N., 78˚16'W.), a similar indentation, lies 6 miles farther to the SW.

The **Bear Islands** (55˚08'N., 78˚18'W.), a group of seven islands and islets, lies 4 miles NNW of Otaska Harbor.

Pointe Vauquelin (54˚54'N., 78˚52'W.), 24 miles SW of Otaska Harbor, is a low point forming the E entrance point of Long Island Sound.

Caution.—Islets lie up to 11 miles ENE off Pointe Vauquelin. Depths of 5.5 to 16.5m are reported to exist 1 to 2 miles off this coast. Islets and shoal water lie up to 2 miles off Pointe Vauquelin, and soundings of 5.5 to 11m are located about 4 miles NNW of this point.

15.28 Long Island (54˚52'N., 79˚22'W.) lies parallel to the mainland, about 5 miles offshore. Its E end is located 6 miles WNW of Pointe Vauquelin. The island is about 25 miles long with an average width of about 2 miles and heights of less than 61m. Low limestone cliffs broken by wide valleys comprise the S shore. Good shelter for small craft is to be found in a small bight in the S shore, about 8 miles from the NE end of the island. A shoal spit protects the outer part of the bight, which is entered to the W of the spit. A depth of 5.5m is reported in the entrance, with a depth of 9.1m inside. A depth of 4.6m exists 2 miles NW of the SW extremity of Long Island.

A tower equipped with radar reflector and a fluorescent orange rectangular daymark on the N seaward face is situated on the small islet lying close SW of the SW end of Long Island. Dangers, extending as far as 9.3 miles SW of the islet's daybeacon, obstruct the SW approach to Long Island Sound.

Long Island Sound, the passage separating Long Island from the mainland, has mid-channel depths ranging from 12.8 to 54.9m in the E half of the sound, but the W portion is heavily encumbered by islands and shoals. A channel, suitable for small vessels, leads through the center of the islands. The reef which lies in the E approach to the channel dries 0.9m.

There is good anchorage about 0.3 mile offshore, in 27.4 to 32.9m, about 1 mile NE of the bluff on the SW extremity of Long Island.

A reef, which dries 0.3m, lies 0.8 mile SSE of the anchorage.

Directions.—Vessels proceeding through Long Island Sound from the W should steer for 54˚40'N, 79˚50'W, with the NW extremity of Pointe Louis XIV bearing 126˚, 3.4 miles distant. From this position steer 040˚ for 4.9 miles until the SW end of Long Island bears 310˚, 1.9 miles distant. A mid-channel course of 060˚ should then be steered, keeping clear of the shoal water which extends about 0.8 mile W from the small island on the S side of the W entrance. Vessels should keep about 0.2 mile off the chain of islands on the N side of the island, and pass N of the small islet which lies in mid-channel about 6 miles from the W entrance. When the NE point of this islet bears 180˚, 0.2 mile distant, course should be altered to 070˚ to pass through the narrow opening formed by the two is-

lands about 2 miles farther E. The N island has a conspicuous boulder at the highest elevation of its central part. The channel between the islands is about 0.2 mile wide and 12.8m deep. A shoal, with a least depth of 0.3m, extends NE for 0.4 mile from the N point of the S island.

Vessels should maintain a course of 070° and favor the N side of the channel until the conspicuous boulder bears 275°. Course should then be altered to 090° to pass midway between a reef, which dries 0.9m in 54°48'N, 79°25'W, and an island 0.5 mile to the N. From there a course of 072° leads through the main part of the sound, passing N of the rocky islet (54°46'N., 79°16'W.) which lies about 5.5 miles E of the drying reef described above.

Cape Dufferin to Pointe Louis XIV—Off-lying Islands

15.29 The **Marcopeet Islands** (57°54'N., 79°39'W.), a chain of four small islands 8 miles long, lie in a N-S direction. The largest island is barren and only 15m high.

The **Sleeper Islands** (57°30'N., 79°50'W.), located 14 miles S of the Marcopeet Islands, extend 25 miles farther to the S.

A rocky shoal lies midway between the Marcopeet Islands and the Sleeper Islands.

Kidney Island, an irregular-shaped island, 31m high, is the largest island in the group. A chain of small islands lying close off the E side of the N end of the island form a sheltered harbor for small vessels. Reefs and drying shoals are charted up to 4 miles E of Kidney Island.

A tower fitted with a radar reflector lies about 9.5 miles SSW of the N extremity of Kidney Island.

The island close S of Kidney Island has an elevation of 40m.

Beach Island (57°28'N., 79°04'W.), located 22 miles E of Kidney Island, is a small island of shingle beaches. It is only 9m high.

The **King George Islands** (57°18'N., 78°24'W.), a group of islands 24 miles in extent, lie 32 miles E of Kidney Island.

Husky Island (57°30'N., 78°38'W.), 36 miles E of Kidney Island, lies near the N end of the King George Islands. The rocky island, 18m high, is almost divided in two by a long narrow inlet that extends SE from the N side of the island. The inlet forms a good harbor with fairly deep water in the anchorages, but with depths of only 1.8 to 2.4m in the entrance.

An unnamed island lies 3 miles WNW and another 3 miles NE of Husky Island.

Driftwood Island (57°18'N., 78°24'W.), the largest of the group, with an elevation of 31m, lies 12 miles SSE of Husky Island. Two shingle beaches on the E end of the S side of the island form a harbor for small craft. Shoal water extends up to 5 miles W of the island.

15.30 The **Belcher Islands** (56°20'N., 79°50'W.), a group of four large islands, and several groups of smaller islands lie 65 miles W of the Nastapoka Islands. The islands extend about 80 miles in a general N-S direction over a width of about 45 miles between 55°40'N and 57°00'N. Numerous lakes and ponds dot the interiors of the islands, which are generally low with elevations of 61 to 91m. The long narrow peninsulas and inlets forming the group lie in a general N-S direction. From W to E, three of the four large islands are Kugong Island, Flaherty Island, and Tukarak Island. The fourth, Innetalling Island, lies close SSW of Tukarak Island. The island group N of the four main islands is the North Belcher Islands; the group of small islands N of Tukarak Island are the Bakers Dozen Islands.

The W and SW coasts of the main islands are indented. They are rougher than the E shores and more dangerous to approach.

Winds—Weather.—The climate of the islands differs considerably from that of the mainland to the E. For the same period, the islands had a greater proportion of overcast skies and fog, stronger and more constant winds, but higher and more uniform temperatures than the meteorological conditions at the Grande Riviere de la Baleine.

Ice.—Limited information is available concerning ice conditions in the vicinity of the Belchers. It has been reported that the season of open water around these islands varies considerably. Some years the islands have been surrounded by pack ice as late as the middle of August, but generally ice-strengthened ships can approach the islands about the first week in July.

Tides—Current.—Caution should be observed when making the passage S of the North Belcher Shoals, as tidal currents of approximately 3 knots tend to set across the passage.

Caution.—Most of the waters surrounding the Belcher Islands have not been sounded and much of the hydrographic information is of a reconnaissance nature. Unsounded waters should not be entered without local knowledge. Caution is advised in sounded water.

15.31 The **North Belcher Islands** (56°53'N., 79°41'W.) lie close NW of the main Belcher group. They are Split Island, Radar Island, Laddie Island, Johnson Island, and the Lukisee Islands. North Belcher Shoals lie about midway between the North Belcher Islands and the Sleeper Islands.

North Belcher Shoals (57°06'N., 80°03'W.) lie 10 miles NW of the North Belcher Islands; they are about 6 miles long in a N-S direction. There is a general depth of 9.1m over the shoal, with a depth of 1.2m near midshoal and a depth of 1.8m near the S end.

From the W, the passage between the Sleeper Islands and the North Belcher Islands should be made S of North Belcher Shoals, where depths of 16.5 to 36.6m can be carried. The area N of North Belcher Shoals has not been fully examined, but it would appear from reconnaissance soundings that shoal water does exist.

The land is low in the vicinity of the North Belcher Islands and position fixing is difficult; however, Radar Island usually provides a radar fix at a distance of 5 miles.

15.32 Split Island (56°50'N., 79°51'W.), the largest island in the North Belcher Islands, is almost split in two by an inlet extending N from the S side. Numerous small lakes and ponds dot the island.

Depths of 0.9m extend for 2.5 miles off the N end of Split Island. There are depth of 11 to 27m in the entrance to the bay on the S side of the island. Inside the depths shoal to 1.8m at its head. The passage between Split Island and Laddie Island has 23.8 to 54.9m in mid-channel.

A tower, equipped with a radar reflector and an orange daymark, is situated on the NW point of Split Island.

Anchorage.—Anchorage is available in the bay on the S side of Split Island, about midway between the entrance points, in 25.6m, mud.

A chain of widely scattered above-water rocks obstructs the passage between the S end of Split Island and the SW part of Kugong Island. Passage between them is not possible without more complete surveys.

Laddie Island (56˚53'N., 79˚41'W.), a narrow island about 6.5 miles long, lies 2.2 miles E of Split Island. Several small islands extend SSE from the S end of Laddie Island and the water off the E side is foul.

Radar Island, about 0.8 mile N of Laddie Island, is reported to be the best radar target when navigating between North Belcher Shoals and Split Island. The channel between Radar Island and Split Island is encumbered by a small islet and shoal water.

Johnson Island (56˚42'N., 79˚32'W.) lies 4 miles SSE of Laddie Island; it is 10 miles long, 2.5 miles wide, and 56m high.

The **Lukisee Islands** (56˚48'N., 79˚33'W.) is a compact group of small islands between Laddie Island and Johnson Island. Depths in the passage are uncertain.

Kugong Island (56˚20'N., 79˚50'W.) is 29 miles long and 61m high at the SW end. Numerous lakes and ponds dot the island. Lillico Point, the N end of the island, lies 4.5 miles S of Johnson Island. Three small islands lie in the passage between Lillico Point and Johnson Island. The largest is 17m high.

Churchill Sound (56˚00'N., 80˚00'W.) separates Kugong Island from Flaherty Island to the E. The sound has not been surveyed and is encumbered by islands and shoals, particularly in its N part.

Moore Island (56˚20'N., 79˚34'W.), the largest island in Churchill Sound, is over 31m high.

15.33 Flaherty Island (56˚10'N., 79˚20'W.), the largest island in the Belcher Islands, comprises several long peninsulas separated by long inlets and bays lying parallel to the peninsulas. The island has an overall length of 59 miles and a maximum elevation of 117m in its NE part.

Howard Point (56˚33'N., 79˚27'W.) is the N point of the Howard Peninsula, which forms the W side of Flaherty Island and separates Churchill Sound from Coats Bay. The peninsula is about 25 miles long and 31m high. A depth of 2.4m lies 2 miles NNW of Howard Point.

Coats Bay is entered between Howard Point and The Bluff, a prominent hill 76m high, located 6 miles ENE. Coats Bay has not been surveyed.

Robertson Bay (55˚46'N., 79˚47'W.), on the S side of Flaherty Island, is entered between Freakly Point and an unnamed point 4 miles to the NW. The bay extends NNE for 23 miles with an average width of 3.5 miles. A chain of small islands and rocks extends SSW for 7.5 miles from the unnamed W entrance point. Another group of small islands lies 2.5 miles SE,and still another group lies 8 miles SSW of Freakly Point. The N part of the bay is encumbered by islands. Little is known concerning the depths in Robertson Bay.

Kasegalik Lake, the largest lake in the Belcher Islands, is about 43 miles long and 12m above sea level. It lies in the form of a U in the central part of Flaherty Island, with the two arms extending NNE.

15.34 Wetalltok Bay (56˚00'N., 79˚20'W.) is entered between position 55˚51'N, 79˚30'W and the S end of the Gibson Peninsula, 7 miles to the E. The unsurveyed inlet extends NNE for 25 miles. An islet lies near mid-entrance, 3 miles W of the E entrance point and a group of small islands and shoals lies about 7 miles NE of the islet.

A chain of small islands and ledges extends for approximately 30 miles SW of the S end of the Gibson Peninsula.

Anchorage is available in the open bight between Freakly Point and the W entrance point to Wetalltok Bay. Vessels anchor 0.5 mile SSE of the islet at the head of the bight, in 36.6m, mud.

Kipalu Inlet (56˚00'N., 79˚10'W.) is a narrow inlet lying between the Gibson Peninsula andthe Mukpollo Peninsula, about 1.2 miles to the E. It extends NNE for about 32 miles. Little is known of the depths in the inlet.

Wiegand Island (56˚40'N., 79˚13'W.), a cresent-shaped island lying close N of Flaherty Island, has an elevation of 76m in its central part.

15.35 Renouf Island (56˚35'N., 79˚08'W.) lies 0.5 mile S of Claw Point, the SE end of Wiegand Island. Wiegand Island and Renouf Island form the N and E sides of Eskimo Harbor. The W side is formed by the peninsula extending N for 5 miles from the NW end of Flaherty Island.

The settlement of **Eskimo Harbor** (Sanikiluag) (56˚35'N., 79˚12'W.) lies in the SW part of the bay on the E side of a small inlet. It consists of a Hudson's Bay Company store, a school, and a nursing station. A radio station provides outside communication.

Eskimo Harbor has two entrances, one at each end of Renouf Island. Blocked Passage, the S entrance, is encumbered by a small islet and a depth of 0.3m. The passage is only 300m wide. The N entrance, between Claw Point and Mosisee Point, the N end of Renouf Island, has depths of 11 to 12.8m.

Depths—Limitations.—The least charted mid-channel depth through the entrance is 11.3m. The N and W parts of the harbor have depths of 9.1m to 25.6m, with no apparent dangers, but the area has not been completely sounded. In the vicinity of the settlement at the S end of the harbor, there are depths of 7.3 to 11m. About 2 miles W of Mosisee Point, near the central part of the harbor, there is a group of islets and rocks surrounded by shoal water. Depths less than those charted have been reported and caution is advised when using this harbor due to the possibility of shifting sand shoals.

Aspect.—An oil tank and a radio tower, both situated E of the settlement, are conspicuous.

Anchorage.—Anchorage, with good holding ground, is available 1.5 miles E of Claw Point, in depths of 26 to 31m. Anchorage is also available off the settlement, in depths of 11 to 15m.

The **Bakers Dozen Islands** (56˚41'N., 78˚49'W.) is a chain of ten islands, about 22 miles long, lying in a general N-S direction.

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Twin Cairns Island (56˚31'N., 78˚49'W.), the S island in the group, is 29m high. Shoal water extends 2 miles W of the island.

Cake Island and Bun Island, two small islands, lie 3 and 5.5 miles N of Twin Cairns Island. A depth of 7.3m, position doubtful, lies 3 miles WNW of Cake Island.

Loaf Island (56˚40'N., 78˚47'W.), 2 miles N of Bun Island, is the largest in the group. It is over 30m high. Shallow water, marked by tide rips, extends 0.7 mile W from the island.

The other islands in the Bakers Dozen group are unnamed and extend N of Loaf Island.

15.36 Tukarak Island (56˚10'N., 78˚45'W.) lies 3.5 miles E of Flaherty Island. Omarolluk Sound separates the islands. The island is 22 miles long, 7 miles wide, and over 152m high. It is the highest island in the Belcher Group.

Four Steps Hill, 2.5 miles S of the N end of the island, has a step-like formation on its S side, 93m high. The hill itself, which rises 123m, is a good landmark.

Laddie Harbor, on the E side of Tukarak Island, affords no shelter. It is too shallow even for small craft.

Mavor Island, located close S of Tukarak Island, rises to 61m in its central part.

Fairweather Sound (56˚08'N., 78˚48'W.), which separates Mavor Island and Tukarak Island, can only be entered from the E. The W approach is shallow. Shallow depths in the narrow channel and lack of swinging room limit the use of the anchorage to small vessels only.

Fairweather Harbor, entered about 8 miles SW of the E entrance to Fairweather Sound, has depths of over 18.3m, with the exception of a 2.1m shoal extending about 0.5 mile N of the S entrance point. Due to limited swinging room, anchorage is limited to small vessels.

Innetalling Island (55˚55'N., 79˚03'W.), a narrow island close SSE of Tukarak Island, extends SSE for 19 miles, forming part of the E side of Omarolluk Sound. In places, the island rises to more than 61m.

O'Leary Island and Broomfield Island extend 7 miles to the SW from close S of Innetalling Island. The narrow islands, which closely parallel each other, have heights of 31 to 61m.

A light and a racon are situated on Sainsbury Point, the S extremity of Broomfield Island.

Ridge Passage (55˚47'N., 79˚08'W.) separates Innetalling Island from O'Leary Island and Broomfield Island. Shallow depths of 0.6m in the narrow channel make the passage impassable.

15.37 Omarolluk Sound (56˚00'N., 79˚05'W.), the main channel through the principal Belcher Islands, lies between Flaherty Island on the W and Tukarak Island, Innetalling Island, and O'Leary Island on the E. The sound is about 48 miles in length, with an average width of 3.5 miles. Along the shores the hills rise sharply to heights of 61m.

Tides—Currents.—Strong tidal currents, with velocities to 3 knots, occur in the entrances to the sound. There are heavy tide rips at the change of tide. Within the sound, the ebb tide flows S and the flood tide N.

Depths—Limitations.—Shoal water predominates the first 8 miles inside the N entrance; however, a least depth of about 9.1m can be carried from a point midway between Range Island, which lies in mid-entrance, and the NW point of Tukarak Island to the Gilmour Peninsula. South of the peninsula, depths range from 18.3 to 73.2m.

A chain of small narrow islands extends for 13 miles in a SSE direction from a point 9 miles inside the N entrance. The islands parallel the E side of the sound about 0.5 mile offshore.

Walton Island (Wolton Island) (56˚00'N., 79˚03'W.) lies close off the NW side of Innetalling Island; the island is 4 miles long and about 31m high.

The Camp Islands, two small narrow islands, lie 3 miles SSW of Walton Island. A drying flat connects the islands at LW.

Anchorage.—Anchorage can be taken in the channel E of Walton Island, in 27m, mud. Anchorage is also available 1.2 miles S of the southernmost Camp Island, in 18m, mud, good holding ground. Good anchorage may be taken, in a depth of about 11m, mud and sand, 0.6 mile S of Desgoffe Point, on the E side of Omarolluk Sound, 5 miles within the N entrance.

The recommended entrances to Omarolluk Sound are, from the N, between Range Island and the NW point of Tukarak Island and, from the S, through Narrow Passage at the S end of the O'Leary Island. The other charted entrances to the sound are either foul or too shallow for even small vessels.

15.38 Narrow Passage (55˚40'N., 79˚16'W.) leads between the SW end of O'Leary Island and the chain of small islands extending 2 miles to the SW. The passage is about 137m wide with a least depth of 13.4m.

Vessels entering Narrow Passage from the SE should round the islet, 15m high, lying 0.7 mile SW of Sainsbury Point, the S point of Broomfield Island, at a distance of about 0.5 mile. Steer NE for 0.6 mile until the S end of O'Leary Island and the low islet about 0.1 mile SW of it are open. From there a course of about 312˚, favoring the O'Leary Island side of the channel, will lead through the passage between the two in safe water.

Caution.—Numerous small islands, islets, above and below-water rocks, and shoals lie between the Belcher Island group and the Nastapoka Islands, off the mainland to the E. Extreme caution should be exercised when navigating in this area, as only approximate positions are charted for some of the dangers.

The Salikuit Islands, a group of several large islands and many islets and rocks, is located about midway between the Belcher Islands and the mainland. This group covers an area of 10 miles NNW-SSE and 25 miles WSW-ENE, and is reported to be fringed by shoal water for 6 miles N and S. A chain of islands is reported to stretch NNW from the Salikuit Islands for 47 miles to the King George Islands.

James Bay

15.39 James Bay is entered between Pointe Louis XIV and Cape Henrietta Maria, about 90 miles to the WNW. It is about 210 miles in length, with an average width of 100 miles. The low, flat shores of the bay are fringed by wide mudflats, beyond which there is a shoal bank with a depth of only a few meters. Numerous islands, rocks, and shoals fill the bay. There are no harbors for large vessels. Most of the many rivers flowing into James Bay are obstructed by bars at their entrances.

Winds—Weather.—Forested lowlands comprise the coastal regions of most of James Bay. Resistance to winds in the area N of Bear Island is small because of the sparse tree-cover. Towards the S, especially S of Akimiski Island, increasing tree-cover gives a dampening to the winds that decreases the frequency of strong winds, especially in the estuaries of the navigable rivers.

Midwinter temperatures are fairly uniform from S to N. From the end of October to early May, sub-freezing temperatures are possible. The spring rise brings daily temperatures up to freezing at Moosonee about April 25, and Pointe Louis XIV in the middle of May. Thereafter, the rise of shoreline temperatures is retarded by the melting ice cover.

The effect is noticeable in the extreme maxima. For instance, Moosonee has been as high as 27˚C in April, Fort George only 19˚C. Snow cover is usually less than 3cm at Moosonee by mid-May. Thereafter, offshore flow may enable temperatures to reach the thirties, May through September. In the fall the shoreline temperatures show a less rapid decline under the influence of the open waters. The mean daily temperature drops to freezing at Pointe Louis XIV about October 25, at Moosonee about a week later. In November, while freeze-over is progressing, shoreline temperatures are less likely to drop as low as inland temperatures.

Annual snowfall is about 250cm. Little can be expected in October. The average of 50cm in November is partly attributable to flow off the open waters and partly to the fall storms. In the period of January to March, proximity to winter storms results in an average monthly accumulation of 40cm.

Average annual rainfall is in the range of 400 to 500mm. Thunderstorms occur at Moosonee on average of 3 days monthly, from June through August.

Moosonee reports are representative of inland regions, where fog is rare in the cold months and usually found only near sunrise in the summer months. Over James Bay when the ice cover is decreasing, fog is more usual, especially in the N. In the S, rapidly rising water temperatures decrease the frequency of fog towards mid-summer, but lingering ice cover in the N maintains a cold surface that is effective in producing fog into August, as illustrated by the frequency of fog at Poste-de-la-Baleine.

Ice.—James Bay is affected by its inland location. Freeze-up there develops in mid-November, about two weeks ahead of Lake Melville at the same latitude on the Labrador Coast, and over a month earlier than the open coast of Southern Labrador. Because of the shallow nature of James Bay, the ice spreads quickly and ice cover is nearly complete by early December.

During the winter, the fast ice grows to 0.5m at Moosonee by 1 January and to 0.8m by 1 April. The fast ice is of moderate extent, but the scale of motion of the offshore pack is because of the reduced area. A sizable open water area can develop S of Akimiski Island, but flaw leads elsewhere are quite narrow.

Ice cover is solid across James Bay in winter, except for shore leads. As spring melt begins and open water increases, the cold underlying surface increases the likelihood of fog. Rapidly warming water temperatures in the S lower the possibility of fog by early July, but lingering ice cover in the N in late July keeps fog frequencies, with onshore flow, high into August.

Melting begins in late April. In this situation the latitude, the inland location, and N-flowing rivers tend to advance the season, but it is not until the latter half of May that the bay begins to clear. The clearing progresses from S to N at first, then extends along the Quebec shore, so that by the end of June, dispersed ice or open water covers the whole area S of Akimiski Island, and along the Quebec shore to Cape Jones and Poste-de-la-Baleine.

The NW portion of the bay is subject to occasional intrusions of ice from Hudson Bay, and although clearing can develop in July, it is not unusual for some ice to persist until early August.

James Bay ice is noted for its soil content, a feature which is thought to be related to the freezing of muddy water in the fall, a condition which the shallowness of the bay and wind conditions in November will induce. Spring melting then concentrates the sediment on the surface of the ice, and river run-off over it prior to break-up can be a contributing factor.

Caution.—Many of the islands in the bay have not been accurately located. Their charted positions cannot be relied upon.

15.40 The E coast of James Bay is very irregular, with numerous points and bays; many small islands lie close offshore. Low land backs the shore and elevations seldom exceed 31m. Much of the coastal water has not been completely surveyed, shoal depths extend up to 20 miles offshore. There are several large off-lying islands and many rivers flow into the bay along the E shore.

Between Pointe Louis XIV and Walrus Point, 60 miles to the SSE, the shoreline is broken by numerous bays and fronted by a myriad of islands.

Pointe Louis XIV (Cape Jones) (54˚38'N., 79˚46'W.), the E entrance point to James Bay, is the W extremity of a low irregular-shaped point extending about 1 mile W from the mainland. Two large domes, 35m high, are conspicuous on the point. A disused airstrip and some abandoned buildings are also located here. A shoal, with a depth of 6.1m, lies 8 miles WNW of the point.

George Bay (54˚37'N., 79˚40'W.) is entered between Pointe Louis XIV and Shave Point, 3.2 miles to the SE. The bay is foul and the entrance is encumbered with islets. It is not suitable for anchorage. In bad weather, anchorage is available leeward of Long Island, 6 miles to the N.

15.41 Cape Jones Island (54˚36'N., 79˚46'W.) lies 3.5 miles W of Shave Point. It has an elevation of 17m and is the largest of a group of islands in this vicinity.

The **Roggan River** (54˚24'N., 78˚30'W.) flows into James Bay, 16 miles SSE of Pointe Louis XIV. A seasonal fish camp at the mouth of the river is available for emergency shelter.

The Riviere au Phoque enters James Bay about 8 miles to the N, while 5 miles farther S, the Riviere Kapsaouis empties into the bay.

Bare Island (54˚26'N., 79˚56'W.), 15 miles W of the mouth of the Roggan River, is a small island of pink and white granite, 18m high, with a light covering of moss and grass.

A tower, equipped with a radar reflector and fluorescent orange rectangular daymarks on the N and S seaward faces, is located on the island.

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Pointe Attiquane (54˚18'N., 79˚28'W.), a low point 2 miles S of the mouth of the Riviere Kapsaouis, extends 1.5 miles W from the mainland.

Pointe Kakassitug (54˚10'N., 79˚22'W.), 7.5 miles SSE of Pointe Attiquane, has a group of islands 1 mile to the W.

15.42 Off-lying dangers.—Several dangers lie in the vicinity of Bare Island. A shoal, the position of which has not been accurately determined, lies about 3 miles E of the island. A depth of 8.5m lies 12.5 miles S of Bare Island. Five miles farther S there is a depth of 9.8m. A rocky depth of less than 1.8m (position approximate) lies 13 miles SSE of Bare Island.

Grey Goose Island (53˚55'N., 79˚53'W.), 32 miles SSE of Bare Island, is 29m high. The gradually sloping sides of the island are strewn with boulders.

A radar reflector tower equipped with a fluorescent orange daymark on its E seaward face is situated on Grey Goose Island.

A rocky depth of less than 1.8m lies 2.5 miles NE of Grey Goose Island. Another rock (existence doubtful) lies 3 miles SW of the island.

A chain of either shoals or low-lying islands appears to extend between Grey Goose Island and Sunday Island. Mariners should avoid this area.

North Star Shoal (53˚58'N., 79˚57'W.), with a least depth of 3.4m, lies 3 miles NW of Grey Goose Island. A sunken rock is charted 7.3 miles NW of the shoal.

East Cub Island (54˚02'N., 80˚11'W.), a small rocky islet, 4m high, is located 9 miles NW of North Star Shoal.

Pointe Kakachischuan (54˚02'N., 79˚05'W.), 14 miles SE of Pointe Kakassitug, forms the N side of Paul Bay. Numerous islets and rocks obstruct the entrance to the bay, which is too shallow even for small craft.

Goose Bay (53˚56'N., 79˚06'W.) lies 4 miles S of Paul Bay. The Riviere Guillaume flows into the head of the shallow bay.

Wastikun Island, a cone-shaped island, 42m high, having the appearance of a black crater, lies close off the N entrance point to Paul Bay. It is the most conspicuous landmark in the vicinity.

15.43 Stromness Island (53˚52'N., 79˚08'W.) is 1.8 miles long and 15m high. It lies off the entrance to Stromness Harbor, close S of Goose Bay. Numerous islands and drying flats fill the bay.

Boat Island lies close S of the W end of Stromness Island.

A lighted range, in line bearing 356˚30' astern, marks the channel leading to Narwhal Anchorage. The front beacon stands at the W end of Boat Island. The rear beacon is on Stromness Island. Both structures are equipped with fluorescent orange daymarks and radar reflectors.

The **Loon Islands** (53˚50'N., 79˚12'W.), a group of small islands, lie about 5 miles W of the entrance to the Grande Riviere. The largest island is 18m high, it lies in the SE part of the group. Numerous drying ledges exist between and extend from most of the islands.

Anchorage.—Narwhal Anchorage, 0.5 mile NE of the largest of the Loon Islands, affords sheltered anchorage, in 11m, clay, good holding ground. Islands N and W of the area protect the anchorage.

15.44 The **Anik Islands** (53˚50'N., 79˚18'W.), a group of four small islands, lie 2 miles W of the Loon Islands. Shoal water extends 0.5 mile offshore around the islands.

A radar reflector is situated on the S of the Anik Islands. The islands are radar conspicuous and make useful landmarks when approaching Narwhal Anchorage.

Several islands and underwater dangers obstruct the approach to the mouth of the Grande Riviere.

Peril Island (53˚48'N., 79˚18'W.), a small island only 0.9m high, lies 1 mile S of the Anik Islands.

Hiding Rock, with a depth of 2m, lies 3 miles SSE of Peril Island.

Wicked Reef, a rocky depth of 2.8m, lies about 4 miles SW of Peril Island.

Marker Island (53˚48'N., 79˚14'W.), a small island 12m high, lies 3 miles ESE of Peril Island. A private beacon on the summit marks the N side of a narrow channel leading into Fort George Anchorage. Mariners unfamiliar with the area should not attempt this channel which has numerous dangers along the S side of the passage.

Qairulik Reef (Seal Reef) (53˚51'N., 79˚18'W.) lies 1.5 miles NNW of the northernmost Anik Island. Several rocks awash, which generally break, mark the reef and are usually visible except in calm conditions at HW.

Narwhal Passage, the recommended track into Narwhal Anchorage, leads between Qairulik Reef and the Anik Islands. Depths in the channel range from 17.7 to 39.6m.

Turning Island (53˚51'N., 79˚13'W.), the N island in the Loon Islands, lies 2.5 miles NE of the Anik Islands. This small island, 2.4m high, marks a turn in the recommended track to Narwhal Anchorage.

A tower equipped with a radar reflector is situated on Turning Island.

15.45 Double Island (53˚50'N., 79˚10'W.), 6.7m high, lies 0.8 mile NNE of the largest Loon Island. It forms part of the N side of Narwhal Anchorage. Shoal water, with a least depth of 2.6m, extends 0.7 mile ENE of the island.

The **Seal Islands** (53˚50'N., 79˚08'W.) lie 1 mile E of Double Island. Drying ledges extend a short distance E and W of these two small islands. The E island is 4m high.

Fort George Anchorage lies E of the largest Loon Island and S of the Seal Islands. Vessels supplying the community of Fort George use this anchorage, which is exposed to NW winds. During gales from that quarter, vessels seek the greater protection of Narwhal Anchorage.

East of Fort George Anchorage, shoal depths of less than 1.8m predominate. A draft of 3m can be carried across this extensive shoal delta into the Grande Riviere, with the assistance of a local pilot at HW.

Caution.—Strong currents prevail in this area, particularly with an outgoing tide. With NW winds, navigation in this vicinity can be hazard-ous.

Channels through the delta shift in direction and vary in depth during severe storms and with the alluvial deposits carried down by the river. Only small boats familiar with the area should attempt any passage through the delta.

15.46 Directions for Hudson Strait to Narwhal Anchorage.—After leaving Hudson Strait, a vessel should pass be-

tween Mansel Island and the mainland to the E, and when abeam of the light on Cape Acadia, the S end of Mansel Island, distant 15 miles, course should then be altered to the SW. This course should pass 16 miles NW of J. Gordon Island, the NW island of the Ottawa Islands. This course should be continued until House Island, the highest island near the S end of the Ottawa Islands is abeam, distance approximately 25 miles. From this position a S course of approximately 170˚ should be followed to reach a position 12 miles W of Pointe Louis XIV. This last course should pass about 10 miles W of the Belcher Islands.

From a position 12 miles abeam of the conspicuous radar domes on Pointe Louis XIV, a course of 180˚ should be steered to pass Bare Island at a distance of 5 miles. When Bare Island bears 045˚, distant 7 miles, course should be altered to 150˚ to pass Grey Goose Island at a distance of 8 miles. Continue on this course for approximately 8 miles, then alter to 090˚ towards the Loon Islands. At a position 2 miles W of the N Anik Island, course should be altered to 064˚ to enter Narwhal Passage, passing 0.8 mile NW of the N of the Anik Islands. When Turning Island bears 155˚ at a distance of 0.8 mile, a heading of 090˚ should be followed for an approximate distance of 0.9 mile at which position this same island should bear 209˚ at a distance of 0.8 mile. Course should then be altered to 115˚ for 2.5 miles until the lighted range on Boat Island and Stromness Island bears 356˚30' astern. From this position a course of 356˚30' astern should be steered. After passing Double Island, course should be altered gradually to enter Narwhal Anchorage. The northernmost Anik Island, Turning Island, and Double Island are good radar targets.

Depths—Limitations.—Depths along the recommended track from Pointe Louis XIV to Bare Island, though of a reconnaissance nature, would pose no problems for even deep draft ships. Depths are irregular, but vary between 42.7m to over 91.4m. The recommended track S and SE of Bare Island to the Loon Islands vicinity indicates depths of over 30.5m. However, at a distance of 8.5 miles SSW of Bare Island, a depth of 9.1m was reported, and at a distance of 12 miles S of this same island, a shoal depth of 8.5m.

In the approaches to Narwhal Passage, depths of 30 to 41m exist. In Narwhal Passage, along the recommended track, soundings of 25 to 41m are to be found. The least depth on the entire track is 7.6m, located between Double Island and Seal Island.

Caution.—The following cautionary notes should be firmly adhered to when navigating in James Bay:

1. Care should be exercised in firmly fixing one's position.
2. Navigate by the use of established visual and radar landmarks. The radar domes on Pointe Louis XIV, as well as Bare Island and Grey Goose Island, can be used to good advantage.
3. The use of established and recommended tracks is very important.
4. Passage from Pointe Louis XIV to Narwhal or Fort George Anchorage should only be made in daylight, with visibility of at least 3 miles.
5. Assistance of other vessels in the area should be sought, if any doubt arises.
6. When anchored in the Fort George Anchorage, care should be exercised in the event of strong NW winds, at which time vessels should proceed to the sheltered Narwhal Anchorage. Winds in this region generally start from a S-SW direction, gradually veering around to the NW. September and October involve unpredictable weather conditions. Winds of 60 knots from the NW have been experienced in this area.
7. Vessels should be prepared to contend with strong currents in the Loon Islands area, setting to the N or S.

15.47 The **Grande Riviere** (53˚50'N., 79˚04'W.), one of the largest rivers flowing into James Bay, forms a large delta between its mouth and Fort George Anchorage. A depth of 3m can be carried up the river at HW for about 5 miles. The best channel lies close off the N side of the river. Silting and erosion is constantly changing the channels and depths in the river and delta. The river bottom is generally gravel or sand, but boulders may be encountered.

Fort George (Chisasibi) (53˚50'N., 79˚00'W.) is situated on the S shore of the river, about 3 miles upstream of Governor Island. A wharf is situated on the S shore, about 1 mile W of the village.

Wastikun Island is the most conspicuous landmark in the vicinity. When approaching Fort George, the island appears as a black crater formation from seaward.

Anchorage is available in the river, but the outgoing tidal current runs at rates of more than 3 knots.

Between Fort George and the Paint Hills Islands, the coast consists of numerous islands, reefs, shoals, small bays, and wooded points, with few conspicuous landmarks for navigation. The Walrus Islands is the only prominent offshore feature. Vessels navigating along the coast should use Spencer Island and Walter Island, the outer islands, for positioning.

Spencer Island (53˚30'N., 79˚42'W.), 23 miles SSE of Grey Goose Island, rises in terraces to a height of 33m. Numerous boulders lie scattered about the island. Shoal water extends NW of Spencer Island toward Grey Goose Island. Confirmed shoal sightings occur midway between Spencer Island and North Twin Island.

15.48 North Twin Island (53˚20'N., 80˚00'W.), a sand and gravel island covered with moss and grass, is 56m high and lies 11 miles SW of Spencer Island. The N and W sides slope gradually upward, the S and E sides are bluff with a few trees standing out conspicuously. Shoal water extends NE toward Spencer Island for a distance of 5 miles.

Anchorage has been obtained 1.5 miles off the N end of North Twin Island, in a depth of 13m, mud, good holding ground.

Good anchorage has also been found close off the SE side of the island.

Walter Island (53˚18'N., 79˚40'W.), a prominent moss-covered island, 31m high, lies 9 miles E of North Twin Island. The bluffs forming all sides of this island stand out sharply. It is a good radar target. There are no trees on the island. Three drying rocks lie about midway between Walter Island and North Twin Island.

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15.49 South Twin Island (53˚06'N., 79˚54'W.), 5.5 miles SSE of North Twin Island, rises gradually to a height of 42m. It is not a good radar target.

Caution.—A shoal, awash, was sighted by helicopter 11 miles ENE of South Twin Island. The position and extent of this shoal has not been determined and the area should be avoided.

Tees Bay (53˚44'N., 79˚03'W.), a shallow bay 5 miles S of the Grande Riviere, is fronted by Big Island and several smaller islands.

Walrus Point (53˚42'N., 79˚10'W.), the W point of an unnamed island lying close SW of Tees Bay, is 23m high.

Akwatuk Bay (53˚40'N., 79˚00'W.) is an irregularly shaped bight lying between Walrus Point and Earthquake Island, 6.5 miles to the S.

Sea Horse Point (53˚36'N., 79˚04'W.), the N entrance point of Dead Duck Bay, lies 1 mile E of Earthquake Island. A chain of small islands extends W from the S entrance point of the bay for a distance of 5 miles.

The **Riviere au Castor** (Beaver River) (53˚24'N., 78˚56'W.) flows into James Bay, 8.5 miles S of Dead Duck Bay. Several islands extend W from the N entrance point of the river.

Black Whale Island (53˚21'N., 79˚01'W.) lies 3 miles SSW of the mouth of the Riviere au Castor.

The **Comb Islands** (53˚16'N., 79˚00'W.) lie 3 miles S of Black Whale Island. This group of six islands extend W from the N entrance point of an unnamed bay.

Grimmington Bay (53˚17'N., 78˚54'W.) is located 3.5 miles SE of the Comb Islands. Black Island and Goose Island lie in a chain of islands extending W from the S entrance point of the small, shallow bay for a distance of 5.5 miles.

Pointe au Heron (Pointe au Huard) (53˚01'N., 78˚59'W.), about 31m high, lies 12 miles SSW of Grimmington Bay. A chain of islands extends NW from the point for a distance of 5 miles.

Paint Hills Bay (52˚57'N., 78˚55'W.) is entered between Pointe au Heron and Narrow Neck Point, 7 miles to the SSE. The settlement of Paint Hills (Nouveau-Comtoir) is located near the head of the bay. A privately-owned radiotelephone is operated at the Hudson's Bay Company store in the settlement.

The Paint Hills Islands and the Walrus Islands, two chains of large rocky islands, lie in the bay and the approaches. The islands are rusty in color, with heights of 31 to 61m.

Moar Bay (52˚49'N., 78˚47'W.) lies 3.5 miles SSE of Narrow Neck Point. The large bay branches into two arms which extend inland nearly 5 miles. Several rivers flow into the heads of the two arms.

The **Monkey Islands** (52˚50'N., 78˚50'W.), a group of small islands, lie in the middle of the entrance to Moar Bay. The largest island is about 31m high.

Sheppard Island (52˚46'N., 78˚52'W.), 31m high, is the largest in a chain of islands extending W from the S entrance point of Moar Bay.

15.50 Off-lying islands.—Several groups of islands lie offshore along this section of the coast.

Solomons Temple Island (52˚49'N., 79˚09'W.), 31m high, lies near the center of a group of islands located about 12 miles W of Moar Bay. Another smaller group of islands lie 2.5 miles to the N. The water in the vicinity of these islands appears to be shoal.

Pebble Island (52˚45'N., 79˚10'W.) lies 4 miles S of Solomons Temple Island. The high N side of the island rises to a height of 31m. A chain of islets and islands, 9 miles long, lies centered about 10 miles S of Pebble Island.

Weston Island (52˚33'N., 79˚36'W.), 18 miles SW of Pebble Island, is a low sand and gravel island covered with moss and grass. A sand bluff, about 31m high at the S end of the island, is conspicuous.

Sheltered anchorage, protected from N winds, is available S of Weston Island. Vessels anchor, in 34.7m, mud, 2 miles off the beach.

The **Cape Hope Islands** (52˚26'N., 78˚45'W.) lie 6 miles off the coast, 5 miles W of High Rock Island. One large island and several smaller ones comprise the group. The large island, 91m high, is very conspicuous in comparison to the mainland, which is only 31m high.

15.51 Several rivers flow into James Bay between Paint Hills Bay and the Eastmain River.

Black Stone Bay (52˚40'N., 78˚46'W.), 5 miles SSE of Sheppard Island, is encumbered with numerous rocks and islands.

Baie du Vieux Comptoir (Old Factory Bay) (52˚37'N., 78˚44'W.), 1.5 miles S of Black Stone Bay, is also heavily encumbered with islets and shoals. The Riviere du Vieux Comptoir flows into the head of the bay.

High Rock Island (52˚26'N., 78˚34'W.) and Split Island, 1.5 miles to the S, lie E of the Cape Hope Islands. Both of these small islands, 31m high, are connected to the mainland at LW.

The **Eastmain River** (52˚15'N., 78˚34'W.) flows into James Bay about 11 miles S of High Rock Island. Numerous shoals and rocky islands obstruct the entrance to this shallow river, and the approach is difficult even for small craft.

Gull Island (52˚18'N., 79˚02'W.) lies 16 miles WNW of the mouth of the Eastmain River. Five islets extend NW for 5 miles from the small irregularly shaped island.

The **Flock Geese Islands** (52˚14'N., 78˚48'W.), a group of islets, lie 8 miles W of the mouth of the Eastmain River. A rocky depth of less than 1.8m is located close N of the islets.

The **Inner Flock Geese Islands** (52˚09'N., 78˚48'W.), islets and sunken rocks, lie 5 miles S of the Flock Geese Islands.

15.52 The settlement of **Eastmain** (52˚15'N., 78˚30'W.) is situated on the S shore of the river, 2 miles inside the entrance. A Hudson's Bay Company store, a post office, a school, and Anglican and Roman Catholic missions are situated at the settlement.

Ice.—Freeze-up occurs about November 20 and breakup about May 15.

Tides—Currents.—Tidal currents at the settlement are reported to attain velocities of up to 5 knots.

Depths—Limitations.—The approach and mouth of the shallow river are obstructed by numerous shoals and rocky islets. There are depths of 1.8m or less in the estuary. However, a draft of 2.4m can be carried to the settlement and for 6 miles from the entrance at extreme HW. Rapids, 12 miles upstream from the settlement, prevent farther navigation.

Pilotage.—A local pilot is available for the passage from the anchorage in the vicinity of Inner Geese Flock Island to the mouth of the river, and then to the settlement. The pilot may be contacted through the Hudson's Bay Company radiotelephone.

Anchorage.—The recommended anchorage is midway between the Inner Flock Geese Islands and an unnamed island, 4.2 miles to the W. Vessels anchor, in 12m, clay and sand, good holding ground, with good protection from most winds. The anchorage is 15 miles from the settlement, but a vessel can approach closer by proceeding on a course of 072˚ to the river entrance. Shoaling occurs gradually to depths of 1.8m in the estuary.

Directions—Fort George to Paint Hills Bay.—The same track should be used as described previously for entering this area by proceeding W to a position 4 miles W of the Anik Islands, at which position course should be altered to 180˚. This course should be followed for approximately 56 miles. Landmarks along this part of the E coast of James Bay tend to blend into the background and are very difficult to distinguish. However, a group of small islands lie 2 miles WNW of Earthquake Island, which provide a conspicuous radar target and are prominent to the naked eye as well.

This track passes 10 miles E of Spencer Island and 9 miles E of Walter Island, and both of these islands provide very good radar targets. An area of shoal water lies close W of this track, about 9.5 miles SE of Walter Island. This reef breaks in all but calm sea conditions and can easily be detected. South Twin Island, lying 10 miles SW of Walter Island, does not provide a good radar target for an accurate plot on this track. However, Walrus Island in the approaches to Paint Hills Bay is a conspicuous landmark over 61m high.

When Walrus Island is abeam, distant 14 miles, alter course to 090˚. This course should pass 1.5 miles N of the NW island in the Solomons Temple Islands. On nearing the Walrus Islands, a small bald rock islet with two white slashes will be observed close W of the Walrus Islands. This islet should be passed on its S side at a distance of 1.2 miles. From this position to the anchorage local knowledge is essential.

A local pilot is available to take vessels with an 2.4m draft from the anchorage to the settlement of Nouveau-Comptoir.

As the recommended tracks are of a reconnaissance nature, vessels are advised to use extreme caution. Strong or prolonged S winds can reduce the water level in the S part of James Bay below chart datum.

Directions—Paint Hills Bay to the Eastmain River.—Vessels proceeding from Paint Hills Bay to Eastmain should follow a course of 270˚ for 14 miles from Walrus Island to rejoin the main N-S track. At this position course should be altered to 180˚ for 29 miles. This course will pass 5 miles W of the farthest W island of the Solomons Temple Islands, and 8 miles W of Pebble Island. Both of these islands are identifiable. Weston Island, 18 miles SW of Pebble Island, provides a good radar target at its S end and this course passes 5 miles E of this island.

Course should then be altered to 090˚ for 13 miles, heading on the S side of the Cape Hope Islands, which are conspicuous. A shoal lies about 1 mile N of this track, having a depth of 5.8m, and a small conspicuous rock-strewn island is located about 3 miles S of the above-described shoal. Alter course to 136˚ to a position 4 miles E of Gull Island, with the island bearing 270˚. At this position, a course of 180˚ should be followed for 8 miles to the anchorage close NW of the Inner Flock Geese Islands. The anchorage has a depth of 12m, clay and sand, with good holding ground and protection from most winds. This anchorage lies 15 miles from the settlement of Eastmain and vessels can proceed cautiously on a course of 072˚ until shoaling prevents further advance. At the estuary of the river there are depths of 1.8m or less. For shallow draft vessels, a local pilot is available to reach the settlement inside the river mouth.

Caution.—It should be emphasized that these recommended tracks are of a reconnaissance nature and every precaution should be observed when following them.

15.53 The **Strutton Islands** (52˚06'N., 79˚00'W.) lie 11 miles S of Gull Island. The E island, the highest of these 2 wooded islands, is 61m high.

Charlton Island (52˚00'N., 79˚25'W.), a wooded island, 31m high, lies 6 miles WSW of the Strutton Islands. It is the largest island in the area, but is reported to be a poor radar target.

Wolf Islet (Wolf Shoal), 2 miles NE of Charlton Island, dries 4m.

Trodely Island (52˚15'N., 79˚25'W.), a wooded island 9 miles N of Charlton Island, has a central elevation of 61m. A drying reef extends off the NE side of the island. The area in the vicinity of the island has not been surveyed and unknown dangers may exist.

The Tiders Islands, a group of three small islands, lie about 3 miles NW of Trodely Island.

Carey Island and Danby Island, two small islands off the E side of Charlton Island, form a protected anchorage between the islands and Charlton Island.

Lisbon Rocks (51˚51'N., 79˚49'W.) is a large area of foul shoal water 7 miles SW of Charlton Island. A single above-water rock, 11m high, lies at the NW end of this area of sunken rocks. Breaking water exists for some distance SE of the above-water rock, which is a good visual and radar target. The passage between Lisbon Rocks and Charlton Island appears to be shoal and should be avoided.

Between the entrance to the Eastmain River and Snape Point, 32 miles to the SW, the low, marshy coast is generally less than 31m high with no distinguishing landmarks. Several small islands and islets lie off this section of the coast, which has not been surveyed.

15.54 The **Sheep River** (52˚06'N., 78˚35'W.) flows into James Bay, 8 miles SW of the Eastmain River.

The **Jack River** (52˚03'N., 78˚42'W.) flows into James Bay, 14 miles SW of the Eastmain River. Several small islets lie off the entrance; an unnamed island is located 5 miles W of Loon Point, the N entrance point to the river.

Boatswain Bay (51˚50'N., 78˚50'W.), a large bight fringed with drying flats, lies 9 miles SW of the Jack River. Caroline Island, 24m high, is the outermost of a group of islands extending 5 miles W from the N entrance point to the bay.

Snape Point (51˚46'N., 79˚02'W.), a low point 20 miles SW of Loon Point, forms the E entrance point to Boatswain Bay. Sherrick Hill, 166m high and conspicuous, rises close E of the point.

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15.55 Rupert Bay (51˚35'N., 79˚00'W.), entered between Snape Point and Pointe Sawayan, 12 miles to the SW, is a large bay extending inland for 25 miles in a SSE direction. Several islands lie in the entrance and four rivers flow into the bay. The settlement of Fort Rupert is situated on the SE shore of the bay.

Tent Island (51˚49'N., 79˚05'W.), 27m high, lies 3 miles NW of Snape Point. Shoal water, with a least depth of 0.6m, extends 2 miles N of the island and a drying, rocky spit extends W for 2 miles from the SW end of the island.

Jacob Island (51˚46'N., 79˚14'W.), 3.5 miles SW of Tent Island, is the largest island in the entrance. It has an elevation of 37m to treetop level. Shoal water extends about 1.5 miles S from the S side of the island. The island is reported to give a poor radar response.

The three channels leading into Rupert Bay are Chrissie Thomey Passage, Emelia Passage, and Inenew Passage.

Chrissie Thomey Passage (51˚48'N., 79˚04'W.) leads between Tent Island and the mainland. Perkins Rock, Maloney Island, and Fredericks Island lie on the E side of the passage, about 2 miles NW of Snape Point. The least depth in the passage, 4.3m, lies at the N end of the channel.

Emelia Passage (51˚47'N., 79˚09'W.), the recommended passage, leads between Tent Island and Jacob Island. The least depth of 4m lies at the S end of the passage.

Inenew Passage (51˚42'N., 79˚16'W.) leads between Pointe Sawayan on the mainland and Jacob Island. The channel becomes very narrow 10 miles inside the entrance and is not recommended.

Boat Passage (51˚42'N., 79˚00'W.) continues S from Chrissie Thomey Passage for a distance of 8 miles. A number of small islets and rocks lie on the E side of the passage, close off the E shore of Rupert Bay.

Several islands lie on the long narrow shoal that separates Boat Passage and Emelia Passage.

Dixon Island (51˚46'N., 79˚06'W.), 26m high with a bare summit, lies at the N end of the shoal area.

Stag Island (51˚40'N., 79˚04'W.), reported to be a good radar target, is located 7 miles S of Dixon island at the S end of the shoal. A prominent rock is conspicuous on the NE side of the island. Dufourmentel Rocks, about 1 mile NE of Stag Island, are only 2m high.

15.56 Moss Island (51˚45'N., 79˚06'W.), 1 mile S of Dixon Island, is 35m high. McNab Rocks extend 1 mile NE and Gushue Island lies close SW of Moss Island.

Stag Rock (51˚35'N., 78˚57'W.), 6 miles SE of Stag Island and reported to be a good radar target, has an elevation of 34m to the tops of the trees.

The Riviere Opamwastic flows into Rupert Bay 10 miles SE of Snape Point; 3 miles farther SE, the Pontax River flows into the bay through the Jolly Islands, which lie in the mouth of the river.

The **Rupert River** (51˚30'N., 78˚47'W.), 5 miles S of the Pontax River, enters the bay 2 miles SE of Poplar Point.

Fort Rupert (Rupert House) (51˚29'N., 78˚48'W.) is situated close inside the mouth of the Rupert River on a point on the S bank. The settlement comprises a Hudson's Bay Company store, a post office, a nursing station, and Anglican and Roman Catholic missions.

Freeze-up usually occurs early in November and breakup during the latter part of May.

Depths in the approaches to the Rupert River vary from 0.9m to 1.8m, but in the river they range from 2.4m to 6.1m.

From Pointe Sawayan, the SW entrance point to Rupert Bay, to East Point, 22 miles to the SW, the coast continues as a low, marshy shoreline with drying flats extending seaward for over 1 mile.

Chiyask Bay (Gull Bay) (51˚29'N., 79˚31'W.) is entered between Pointe Mesaconane and Gull Point, 6 miles to the SSW. The boundary between the provinces of Ontario and Quebec is located midway along the S shore of this shallow bay.

15.57 James Bay—West side.—The W side of James Bay is generally low and swampy, but unlike the E shore, the coastline has a smooth appearance with very few off-lying islands.

Iskoyaskweyau Point (East Point) (51˚24'N., 79˚41'W.) is the E entrance point to Hannah Bay. From Iskoyaskweyau Point the coast continues S for about 15 miles to the head of Hannah Bay, which is also the head of James Bay, then the shore swings NW for 32 miles to North Point.

Hannah Bay (51˚15'N., 79˚50'W.) is entered between Iskoyaskweyau Point and Natatishee (Natabisha) Point, 18 miles to the WSW. Drying flats fringe the shoreline, but little is known concerning the depths in the bay. Several rivers flow into Hannah Bay.

Arnold Point (51˚20'N., 80˚23'W.), the S entrance point of the Moose River, lies 10.5 miles WNW of Netitishi Point. It is a low point somewhat higher than the surrounding country. This point is the first definable target to be noted on radar when approaching the Moose River.

The **Moose River** (51˚20'N., 80˚25'W.) shares a common estuary with the Abitibi River and the North French River. The entrance is about 1.5 miles wide between Arnold Point and the Ship Sands Islands. Extensive drying flats lie off both entrance points.

North Point, located about 7 miles N of the mouth of the Moose River, is the first identifiable radar target when approaching from the N. A racon is situated on the point.

Ship Sands (51˚24'N., 80˚23'W.) are the drying mud flats extending NE of Ship Sands Island.

East Bar (51˚22'N., 80˚20'W.) is a similar drying flat with large boulders projecting NE of Arnold Point.

Sand Head and Nielson Bar, two smaller drying flats, lie close off Ship Sands and East Bar.

Le Moyne Passage (51˚24'N., 80˚20'W.), the recommended buoyed passage for vessels proceeding to Moosonee, leads between Sand Head and Nielson Bar. Depths of 1.8 to 3m are located in mid-channel. Water in the passage is relatively calm in N winds, but heavy breakers occur in the shoal water close S.

The entrance to Le Moyne Passage is marked by a lighted buoy. The channel SE and S of Ship Sands Island is marked by buoys.

Duncan Passage (51˚25'N., 80˚21'W.), the shallow passage between Sand Head and Ship Sands, has a least depth of only 0.3m.

Close S of the SW end of Ship Sands Island, a chain of islands and drying flats divides the Moose River into North Channel and South Channel.

South Channel, entered E of the Horseshoe Islands, leads to Moose Factory. It can only be navigated by canoes, as Horseshoe Shoals have only 0.3m of water over them.

North Channel, the main channel leading to Moosonee, has mid-channel depths of 1.2 to 4.6m and is buoyed. These buoys are moved, when necessary, to mark the best channel.

15.58 Moosonee (51˚17'N., 80˚37'W.) (World Port Index No. 1120) settlement is situated 7 miles upstream from Ship Sands Island, on the N side of the North Channel. A vessel drawing 2.4m can reach Moonsonee at HW. At the settlement there are hotels, restaurants, a post office, and a telegraph office. A detachment of the Ontario Provincial Police is stationed here. Several churches, a Hudson's Bay Company store, schools, and a meteorological station are also situated here.

Moonsonee is the N terminus of the Ontario Northland Railway, which is connected with the two main major railways at Cochrane and North Bay, Ontario. The Hudson's Bay Company Transport Service uses Moonsonee as a base to supply various ports in James Bay. Air service to settlements in James Bay and Hudson Bay is available.

Ice.—Freeze-up generally occurs in early November and breakup in the river is usually complete by mid-May. Pack ice may linger in the vicinity off Sand Head. The normal navigation season is from about 20 June to mid-October.

Depths—Limitations.—A floating wharf, set up during the navigation season, consists of a ramp extending to a barge. Barges drawing up to 1.8m dock at this wharf, which is situated near the end of the railway spur.

Aspect.—An illuminated cross is shown on the spire of the Roman Catholic Church at Moosonee; a prominent water tower is situated 0.2 mile NW of the church.

Microwave and radio towers, fitted with red air obstruction lights and situated near Moosonee, are conspicuous.

A light is shown on the narrowest part of Charles Island, about 0.8 mile S of Moosonee.

Anchorage.—Anchorage is available 0.9 mile ENE of the birdwatching tower on Ship Sand Island, in 4.3m, mud and sand, good holding ground.

Vessels may also anchor about 8 miles E of North Point, in 7.3m, good holding ground.

Moose Factory (51˚15'N., 80˚36'W.), a small settlement, is situated on the SE side of Moose Factory Island, about 2 miles SE of Moosonee. The settlement comprises a hospital, a post office, two churches, a school, and a Hudson's Bay Company store. A detachment of Ontario Provinical Police is stationed here.

15.59 Bear Island (54˚21'N., 81˚06'W.) is located in the N central part of James Bay, 50 miles WSW of Pointe Louis XIV. Several smaller islands lie in the same area. Bear Island is 3 miles long, 1 mile wide, and 19m high. The island is bare of vegetation and appears black.

A disused airstrip is situated near the W central part of the island. There are no buildings on the island. The former military installation no longer exists.

Several dangers lie off the SE, SW, and S sides of Bear Island.

Sheldrake Shoal (54˚20'N., 81˚04'W.), with a depth of 1.2m, lies 1.25 miles E of the SE end of Bear Island.

The **Two Cubs Islands** (54˚20'N., 81˚08'W.) lie 0.6 mile W of the SW end of Bear Island. The highest island has an elevation of 11m.

South Bear Island (54˚17'N., 81˚06'W.), a small rocky island 9m high, lies 2 miles S of Bear Island. Shoal water extends 0.8 mile NE from it.

North Bear Island (54˚28'N., 81˚02'W.), 5.75 miles NNE of Bear Island, is 20m high.

Sunday Island (54˚18'N., 80˚40'W.), a rocky, limestone island, lies 15 miles E of Bear Island. The gradually sloping island is 17m high with numerous boulders scattered about. It is not a good radar target.

An unexamined shoal area lies 8 miles E of Sunday Island.

Gasket Rock, with a depth of less than 1.8m, is located 20 miles SW of the S end of Bear Island.

Directions.—Vessels bound for Moosonee, when entering James Bay, should make for a position approximately 3 miles E of Bear Island. A course of 158˚ should then be steered to pass about 5 miles W of North Twin Island and South Twin Island to a position 4.5 miles SW of Weston Island, which can be seen on radar at a distance of 11 miles on this course. From this point course should be altered to 200˚. On this course, Trodely Island and the farthest W of the Lisbon Rocks provide good visual and radar targets, but Charlton Island should be used with caution.

When approaching the estuary of the Moose River, the land adjacent to the river is flat and inconspicuous from seaward. North Point is the first landmark to be picked up on radar at about 9 miles off. Good visual bearings cannot be observed until 4 miles off the fairway buoy. Anchorage outside the fairway buoy is afforded, in 7.3 to 9.1m, mud; the holding ground is reported to be good.

Caution.—Mariners are cautioned that many of the islands lying close to the recommended track have low-lying extremities, and that care should be exercised when observing and plotting visual bearings of the islands.

15.60 From the Moose River to the Albany River, 65 miles to the NW, the low, flat coast is fringed with drying flats and shoal water. There are no prominent features, but several rivers flow into James Bay along this stretch of the shoreline.

The **Albany River** (52˚16'N., 81˚28'W.) is about 7 miles wide at the entrance and is divided into several channels by the numerous islands and flats which encumber the mouth of the river. Albany Island is the largest. It divides the river into North Channel and South Channel.

Fort Albany (52˚14'N., 81˚36'W.) is situated on the SW shore of Albany Island. The settlement consists of a Hudson's Bay Company Store, a nursing station, and Roman Catholic and Anglican missions.

At HW, there are depths of 2.4m on the bars at the mouth of the river. This depth can be carried upriver for a distance of 7 miles.

Drying flats extend up to 4 miles offshore from the E side of Albany Island and along the shoreline SE of the entrance to

South Channel. Depths of less than 5.5m extend seaward up to 8 miles off the mouth of the river.

South Channel, the recommended passage on the S side of Albany Island, is buoyed. The buoys are not maintained throughout the navigation season. They are subject to change in position and characteristic and are not to be relied upon. Local knowledge is required in navigating this channel.

A lighted buoy, privately maintained, is moored 6 miles E of the entrance to South Channel. There are beacon towers marking a shoal on the N side. These should be left to starboard.

The Albany River should be approached only from the E or SE. Shoals obstruct the N approach.

15.61 Akimiski Island (53˚00'N., 81˚18'W.), the largest island in James Bay, lies 32 miles N of the mouth of the Albany River. It is 54 miles long and about 20 miles wide, with its highest part, 31m, along its S side. The island is swampy and partly wooded; it is not a good radar target.

Cape Duncan, a low flat point, forms the SE extremity of Akimiski Island. Shoal water extends S and SW of Cape Duncan for about 8 miles. This area has not been fully examined and other undetected dangers may exist. Apparently shoals and shoal water extend from all sides of the island.

Gasket Island (52˚25'N., 80˚15'W.), a small sandy island 6m high, lies 22 miles SE of Cape Duncan. Shoals appear to extend at least 3 miles in all directions around the island. The sea breaks on the NE part of the shoal.

Albert Shoal (52˚56'N., 80˚25'W.), 10 miles in length, with an islet at its E end, lies 18 miles NE of Cap Duncan.

Another shoal, extent unknown, is located 13 miles N of Houston Point, the NE point of Akimiski Island.

15.62 Between the Albany River and the Atawapiskat River, 47 miles to the NW, the regular shoreline is fronted by a tidal flat for its entire length. Several rivers and streams flow into James Bay along this stretch of the coast.

The **Attawapiskat River** (52˚56'N., 82˚16'W.) flows through a large delta of grassy islands. The north channel is the deepest; a draft of 2.1m can be carried to the settlement of Attawapiskat, about 7 miles upstream.

Attawapiskat (52˚55'N., 82˚26'W.) is a settlement comprised of a Hudson's Bay Company store and Anglican and Roman Catholic missions. The Roman Catholic Church is conspicuous. A private radiotelephone is operated by the Hudson's Bay Company. The Roman Catholic mission has an equipped hospital.

During the navigation season, the buoys and beacons marking the channel are maintained by the Moosonee Transportation, Ltd. The channel is suitable only for vessels of 150 tons or less and should be attempted only by mariners familiar with the area.

15.63 Akimiski Strait (53˚08'N., 82˚09'W.), between Akimiski Island and the mainland, is heavily encumbered by shoals and flats. The reported maximum depth in the strait is 3.7m, but the strait has not been examined and is reported to be unnavigable.

From the Attawapiskat River to Cape Henrietta Maria, 136 miles to the N, the coast is generally similar to that to the S, except for several wide shallow bights. The rivers flowing into James Bay along this stretch of coast are generally too shallow for navigation.

Ekwan Point (53˚17'N., 82˚06'W.), 19 miles NNE of the mouth of the Attawapiskat River, is a low point fronted by tidal flats. It marks an abrupt change in the direction of the coast from NE to NNW.

Hook Point (54˚53'N., 82˚12'W.), 100 miles N of Ekwan Point, is a low swampy point. It forms the E entrance point of a small bight. Shoal water extends about 7 miles E and 15 miles S from Hook Point.

Some of the larger of the several rivers flowing into the bay along this part of the coast are the Likitusaki River, the Opinnagau River, the Patchepawapoka River, and Nowashe Creek.

A dome, about 7 miles SW of Hook Point, is conspicuous.

Cape Henrietta Maria (55˚10'N., 82˚21'W.), 17 miles NNW of Hook Point, is a narrow peninsula about 5m high. The low point of disintegrated limestone projects N from the mainland for about 6 miles.

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