



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

SECTOR 11 — CHART INFORMATION

SECTOR 11

BORNEO—NORTHWEST COAST

Plan.—This sector describes the NW coast of Borneo, from Tanjong Datu to Tanjong Naruntong, and includes South and North Luconia Shoals. The geographical sequence is NE.

General Remarks

11.1 The NW coast of Borneo, from Tanjong Datu to Tanjong Sempang Mangayau, which lies about 413 miles NE of Tanjong Datu, consists of Sarawak, Brunei, and a part of Sabah.

The coast is fairly regular, but is indented by two large bays. The larger of these bays is located between Tanjong Datu and Tanjong Sirik, a point about 110 miles to the ENE. The other is Brunei Bay, located about 145 miles SW of Tanjong Sampanmangio.

Much of the coast is fronted by tidal mud or sand flats, but is fairly free of fringing reef. Approaches to the coast are fouled in some places by detached shoals and coral reefs.

A number of rivers discharge into the sea along this section of coast, with many of them being navigable for some distance inland by small craft.

Much of the coastal land is low, but about 25 miles inland a mountain range extends in a NE direction and terminates at Mount Kinabalu, which rises to a height of 4,100m.

Labuan, which stands near the entrance of Brunei Bay, is the only island of any importance or size along the NW coast of Borneo.

Kuching, Miri, Brunei, Kota Kinabalu, Kudat, and Victoria are the principal towns on or near the coast.

A number of gas and oil fields have been established off the NW coast of Borneo. These fields contain numerous structures, most of which exhibit lights. They also contain below-water obstructions, some of which may be marked by buoys. As these features are not all charted, special caution should be exercised by vessels navigating in their vicinity.

Oil and gas pipelines are laid between the various platforms and fields, and also from them to collecting stations ashore. Gas pipelines contain flammable natural gas at high pressure. A vessel damaging a pipe could face an immediate fire hazard.

Mariners are strongly advised not to anchor or trawl near these pipelines. Pipelines are not always buried and may effectively reduce the charted depth by as much as 2m.

Mobile oil drilling rigs may be encountered off the NW coast of Borneo, between the 200m curve and the coast. When on location, a rig's moorings may extend 610m and will be marked by unlighted yellow buoys. At night the rigs will display working lights.

Off the NW coast of Borneo and in Palawan Passage, between the parallels of 2°N, 11°N, currents may set in any direction throughout the year with rates up to 1 knot or more and have caused stranding of vessels on either side of the passage.

Winds—Weather.—Along the W and NW coastal areas of Borneo, which is N of the equator, the winds blowing from N

directions, November to April, and from S directions, May to October, are usually referred to as the North Monsoon and the South Monsoon. From November to April, N winds predominate and from May to October the prevailing winds are from the S. Land and sea breezes are effective throughout the year, modifying the prevailing flow to the extent where both N and S winds tend to become W by day and E by night. Both monsoons are characterized by cloudy skies with but few clear days. Light rain squalls are characteristic of the North Monsoon season, while thunderstorms and heavy rain squalls are experienced during the S wind flow.

In the low latitudes in this part of the Pacific, gales appear to be infrequent; at least they are rarely recorded. Near the equator, however, gales have been known to read force 10 or higher from some E direction. Among the records for instance, a SE gale of force 12 hurricane intensity was recorded in April within the ocean area 0° to 5°N, 115°E to 120°E. This was not classed as a typhoon wind since cyclonic depressions do not form so near the equator in these longitudes.

Along the N coast of Borneo, one of the few land areas that had a record of gales, it appeared that the incident was low or nonexistent. It is possible that the gales and squalls, during which higher velocities occurred, were sometimes of brief duration and some may have escaped recording.

Waterspouts and small whirlwinds, also known as windspouts, occur occasionally throughout this area and are most frequent during December or January. In these whirls the wind may attain velocities of 45 miles per hour over land and 55 miles per hour over the sea.

Tropical cyclones are rarely experienced in an area within 5° to 8° of the equator and thus that part of Borneo described in this sector can be expected to be free of these cyclonic storms. So far as is known, the first typhoon recorded over Borneo, occurred on the NE coast in 1904. This storm was very destructive and destroyed numerous plantations and other properties.

In December 1892, a similar storm passed about 60 miles N of the N part of Borneo; on other occasions, they have occurred S of the Philippines and at these times the coasts of N Borneo and adjacent waters have experienced high winds and swells.

In a study based on ships observations, and published by the Netherlands Meteorological Institute, there is no record of any typhoon having occurred S of 8°N, latitude during the year 1910 through 1935.

Temperatures remain equable throughout this area with marked uniformity from day to day and month to month. The noteworthy variations occur with elevation, the lowlands being consistently warm and sultry while the mountain elevations offer a comfortable, bracing climate.

At Labuan, an island off the NW coast of Borneo, the temperatures average 26.7°C from September through March, but there are daily extremes of 35.6°C in May and 15.6°C in April and June.

In general, rainfall is heavy over the area and occurs at all locations every month of the year. Large variations occur from year to year and most of the heavy downpours are confined to a limited area. The heaviest falls occur when the monsoon meets a mountain range close to the coastline. The monthly rainfall at all the stations along the NW coast of Borneo are consistently high with the N coast being relatively dry during the Southwest Monsoon because of the extensive shelter formed by the mountains inland. In general, September and October are the months with the heaviest rainfall whereas the months of January through March are the months with the least fall.

Mean cloud amount in the tropical zone varies little from day to day or from month to month. On land near the coast, however, there is a marked increase during the morning and massive cumulonimbus cloud accumulates in the afternoon and extensive thunder activity occurs during the evening; most of these clouds disperse overnight. The diurnal range of cloud amount is reversed over the sea, with clear areas during the day and a gradual increase during the night to a maximum around dawn; some of this cloud may spread inland with onshore winds.

Borneo has more thunderstorms than any other region in the world. Many places inland experience thunder on 2 days in 3 and even along the coast many stations report thunder activity on 1 day in every three. Some of the more violent storms cause considerable havoc with severe squalls and torrential rain. Most of these thunderstorms occur between May and September.

Tides—Currents.—Tides are mainly diurnal throughout this area but off the coast of Brunei there are stretches of coast where there is seldom more than one tide a day. The average rise of the tide range from 1 to 1.5m.

In the vicinity of the offshore reef there are local tidal currents which set onto and away from the reefs on all sides. In the narrow channel through the reefs these currents attain greater rates, but generally they are weak and during the strength of the seasonal currents they may be inappreciable.

As a general rule the current along the coast described in this sector sets SW from January through March and September and sets in the opposite direction during the other months.

Over the greater part of the area the currents are generally weak, setting at a velocity of less than 0.5 knots. During the months when the monsoons are fully developed (July, August, December to February) the mean rate increase to between 0.5 to 1 knots. Currents up to 2 knots may be experienced at times in any part of the area in any month and on rare occasions the current may increase up to 3 knots.

Caution.—Numerous oil fields and gas fields exist off the coasts of Sarawak, Brunei, and Sabah. Each field contains clusters of installations, lighted and unlighted, permanent and movable, awash and submerge structures. However, most structures exhibit lights, especially the platforms. Since not all features are charted or marked, mariners are cautioned to exercise special care when navigating in these waters.

Fishing stakes exist in the area covered by this sector, particularly in depths of less than 10m and their positions are frequently changed.

Tanjong Datu to Sungai Sarawak

11.2 Tanjong Datu (2°05'N., 109°39'E.), rugged and precipitous, is the terminations of a mountainous peninsula which rises to two prominent summits. Gunung Datu, 533m high, stands 2.5 miles S of the point and Gunung Malaka, 478m high, stands 1 mile farther S. Gunung Pangi, 240m high, is an isolated peak rising from low ground 2.5 miles S of Gunung Malaka. The mountainous terrain commences 11 miles S of Gunung Pangi.

Tanjong Datu Lighthouse stands at a height of 171m above the point. The W side of Tanjong Datu is fringed by a narrow bank marked by some drying rocks. Four drying rocks lie within 0.5 mile N of the extremity of the point. A dangerous wreck lies 33 miles NE of Tanjong Datu, and another wreck lies 4 miles NW of it.

During June, the current off Tanjong Datu was observed to set SSW for 15 hours consecutively at an average rate of 1.5 knots.

Gunung Datu has been reported to be a good radar target at distances up to 21 miles.

Anchorage.—Anchorage can be taken in depths of 11 to 15m about 1 mile off the W side of Datu Peninsula.

11.3 Niger Bank (Permatang Naga) (2°09'N., 109°39'E.), with a least depth of 7.9m, lies 4.5 miles N of Tanjong Datu and is separated from it by a clear channel. Two 11m patches lie 2 miles WSW and 1.35 miles SW of its shallowest depth.

With fresh N winds and a N current there are tide rips on this bank, which from a distance resemble breakers. There are strong eddies off Tanjong Datu.

A small shoal area, with a least depth of 6.1m, lies about 2 miles E of Tanjong Datu.

From Tanjong Datu, the coast of Sarawak extends 6 miles SSE to Tanjong Serabang (Pirate Point) and then about 20 miles S and SE to the entrance of the Batang Kayan.

A drying rock lies 0.5 mile offshore, about 1.75 miles SSE of Tanjong Datu. This rock lies at the outer end of a foul spit that extends from the shore in a NNE direction for about 1 mile.

Between the extremity of this spit and Tanjong Serabang, the coast is fringed by rocks that extend up to 0.5 mile offshore.

Pulau Datu, an islet 37m high, stands close offshore about 1.5 miles SSW of Tanjong Serabang.

Telok Serabang (1°59'N., 109°39'E.), a small bay lying between Pulau Datu and Tanjong Serabang, is shallow and rock-strewn.

Pulau Serabang (Pulau Kera), an islet 16m high, stands in the entrance of Telok Serabang about 0.8 mile SSE of Tanjong Serabang.

Between Pulau Datu and Tanjong Balinsha (Kelapa Empat), a point about 5.25 miles SSE, shoal water with depths of less than 5.5m extends up to 2 miles offshore. The N half of this shoal area is foul and marked by some above-water rocks.

From Tanjong Balinsha to Tanjong Batu, a point about 11.5 miles ESE, the coast is fronted by shoal water with depths of less than 5.5m, which extends 0.5 to 1.4 miles offshore.

A rock, which dries 2.1m, lies near the edge of the shoal water about 0.6 mile N of Tanjong Batu.

Pulau Talang Talang Besar (1°55'N., 109°47'E.), 113m high, lies about 6 miles ENE of Tanjung Balinsah.

Shoal water, with a depth of less than 1.8m, extends a short distance S of a sandy beach on the E side of this island.

11.4 Pulau Talang Talang Kechil (1°53'N., 109°46'E.), an islet 78m high, lies about 1 mile SSW of Pulau Talang Talang Besar.

Both of the above islands are turtle sanctuaries and have caretakers living on them.

Turtle Rock, which dries 3.6m, lies 1 mile SSW of Pulau Talang Talang Kechil.

The mouths of the Sungai Sirru Besar and the Sungai Sematan lie 2.5 miles SE and 7.33 miles ESE of Tanjung Balinsah. Neither river is of much importance to shipping.

The entrance channel leading into the latter river has a least reported depth of 0.6m on the alignment of the entrance range and leads between two drying sand spits.

The channel is subject to change, particularly during the Northeast Monsoon, and entry should not be attempted without local knowledge. The average rise of the tide is about 0.6m.

Anchorage.—Anchorage can be taken by vessels up to 30.5m in length, in depths of 5.5m within the bar, but it is exposed to the Northeast Monsoon.

Lighted beacons in range, bearing 205.3°, lead over the bar and through the entrance of the river but they do not always indicate the best water.

A radio mast stands about 0.3 mile S of the W entrance point of the river.

Sematan (1°49'N., 109°47'E.), the westernmost port in Sarawak, is the site of a government station. All cargo is lightered to the offshore anchorage. All operations cease during the Northeast Monsoon.

Some small jetties, for the use of small local craft, lie on the W bank of the river about 0.3 mile above the entrance.

Vessels loading from Sematan should anchor in an area 2 miles in extent, which lies with its center about 3.32 miles ESE of Pulau Talang Talang Kechil. Vessels should not anchor W of 109°48.6'E, the W limit of the area. There are no restrictions on light draft vessels anchoring S of the area.

A mooring buoy lies 1.4 miles SW of the E entrance point of the river. There are also several small moorings for lighters.

Tanjung Pelandek (Baugh Point) lies 2.32 miles SE of Tanjung Batu. A rock, with a depth of 0.4m, lies 0.3 miles E of Tanjung Pelandek.

The Sungai Sekambal, of little importance, enters the sea about 1 mile SSW of Tanjung Pelandek.

11.5 Batu Lundu (Batu Mandi) (1°44'N., 109°56'E.), which dries 4m, lies 3.32 miles ESE of Tanjung Pelandek. A light is shown from the NE side of the bank.

The Sungai Lundu entrance lies between Tanjung Bandang and Tanjung Sireh, located 2 miles SW and 1.5 miles SSE, respectively, of Batu Mandi. A shallow channel runs through a drying sandbank which extends 1.5 miles seaward of the river entrance.

There is a depth of 0.3m on the bar of the Sungai Mandi, but passage should only be attempted by vessels with local knowledge. The channel is entered 2 miles E of Batu Mandi and is marked by piles.

Pilotage.—Pilotage is compulsory.

The town of **Lundu** (1°41'N., 109°51'E.) stands on the left bank of the river 12 miles above the entrance. Three small wharves front the town along the river bank. The limiting dimensions at Lundu are a length of 48m, a beam of 10m, a draft of 2.4m, and up to 700 grt.

Sungai Sampadi (1°41'N., 109°58'E.) discharges through two entrances 2.5 miles SSW and 3.5 miles SE of Batu Mandi. The W entrance can be approached through the channel to the Sungai Lundu. The E entrance is fouled by drying sandbanks.

A group of fairly high mountains lies NW of Lundu, about 4 miles SW of Tanjung Pelandek. Gunung Perigi, with an elevation of 909m, is the highest.

Pulau Sampadi (1°44'N., 110°05'E.), 122m high, lies about 1.3 miles offshore and 9 miles E of Batu Lundu. Rocks and foul ground extend 0.3 mile from the W side of the island. The N above-water rock is 3m high.

Pulau Satang Besar (1°47'N., 110°10'E.), a densely wooded island 207m high, stands 5 miles NE of Pulau Sampadi. Its SE and S sides are fringed by foul ground; whereas, its other sides are steep-to and clear. A small plantation lies on its SE side.

Pulau Satang Kechil (1°46'N., 110°09'E.), a densely wooded islet, lies 1.3 miles S of the above island. It is fringed by a reef which extends 0.5 mile from its S side. An artificial reef has been established as a fish breeding ground, about 8 miles NNE of Pulau Satang Besar.

Other fish reefs lie 2.5 miles NNW, and 2 miles NE of Pulau Satang Besar. Artificial reefs of used tires are piled in these areas, and mariners are requested to avoid them.

Pulau Tukong Ara and Pulau Tukong Banun, both small in extent, lie 1.5 miles E and 2 miles SE of Pulau Satang Kechil. The above-described islands lie near the outer edge of the shoal water, with depths of less than 7.3m, which extends about 4.5 miles N from the low coast.

11.6 Batu Samarang (Cruizer Rock) (1°52'N., 110°21'E.), awash, lies about 12 miles ENE of Pulau Satang Besar.

During bad weather or with a heavy swell, this rock breaks; at such times it should be given a wide berth. Tanjung Buloh and Tanjung Embang, two points located on the E side of the Tanjung Sipang Peninsula, in range bearing 171°, leads about 0.62 mile W of Batu Samarang, and a tangent on the W side of Tanjung Sipang, in range bearing about 212° with Gunung Serapi, leads about 0.3 mile E of it. At night, Tanjung Po light, bearing not less than 132°, will lead N of Batu Samarang.

Two dangerous wrecks lie about 10.5 miles NW of Tanjung Sipang and are marked by a lighted buoy moored N of the wrecks.

A stranded wreck, the position of which is approximate, lies 6 miles W of Tanjung Sipang. A light is shown from the wreck.

A dangerous wreck, which dries, is situated 1.5 miles W of Tanjung Sipang. A lighted buoy lies 183m NNW of it.

Sungai Rambungan (1°42'N., 110°08'E.) and the Sungai Rayu have a common entrance lying 3.5 miles SE of Pulau Sampadi. A bar, with a depth of 0.3m, lies 1 mile N of the entrance. Within the bar the depths increase to 9.8m abreast the entrance.

Sungai Sibulaut (1°42'N., 110°12'E.) lies 7 miles ESE of Pulau Sampadi. A bar, with depths from 0.3 to 1.2m, obstructs the entrance 1 to 2 miles offshore.

Approaches to Sungai Sarawak

11.7 Tanjong Sipang (1°48'N., 110°20'E.) marked by a light, is the N extremity of a mountainous peninsula which projects N from the mainland. It may be identified from the E or W by two remarkable sugar-loaf peaks, which are prominent from these directions. The northernmost peak, known as The Pouce, is 515m high and conspicuous. Gunung Santubong, 844m high and the S peak, stands 4 miles S of Tanjong Sipang near the S end of the peninsula. A dangerous wreck lies 14 miles N of Tanjong Sipang. A lighted buoy marks close N of two dangerous wrecks, 11 miles NNW of the same point.

Gunung Serapi (1°34'N., 110°12'E.), which rises to a very sharp peak 911m high, stands about 12 miles SW of Gunung Santubong. Close W and at a slightly lesser elevation, stands a lump resembling a castle which is not visible E of Gunung Santubong. A conspicuous radio mast stands on the summit.

Sungai Sarawak (1°43'N., 110°17'E.) has two navigable entrances; Santubong is entered close W of Tanjong Sipang, while Muara Tebas is entered close E of Tanjong Po, 12.5 miles ESE. The latter entrance is the one most generally used.

Kuching, the capital of the State of Sarawak, stands on both banks of the river 20 miles above the entrance of either branch.

Vessels up to 175m in length, with a draft of 7.6m, can reach the anchorage off Kampong Sejinkat, 6 miles above Muara Tebas. Vessels up to 100m long, with a draft of 5.2m, can reach Tanah Puteh Wharf, 2 miles below Kuching.

Dense early morning fog over the river is frequent, especially after heavy rain during the previous night. Normally the fog lifts 2 to 2.5 hours after sunrise.

Another peninsula, which projects in a NNE direction from the mainland for a distance of about 6 miles, is located about 10.5 miles ESE of the Tanjong Sipang Peninsula.

Pulau Lakei (1°45'N., 110°30'E.), a small islet, lies close off the N extremity of the above peninsula. A small rock, with a tide gauge hut, stands close S of this islet. The bay between the two peninsulas has shallow depths and dries in patches near its head. Pulau Lakei has been reported to be a good radar target at 25 miles.

11.8 Tanjong Po (1°44'N., 110°31'E.), the E extremity of the Pulau Lakei Peninsula, is located about 2 miles SE of the peninsula's N end. There is a white streak near the E end of the point. Shoal water, with depths of less than 7.3m, extends almost 0.5 mile offshore between Tanjong Po and the N extremity of the peninsula.

A light is shown from a 18m aluminum pyramidal tower, 0.15 mile W of Tanjong Po. Batu Mandi (White Rock), 2m high, lies near the SE end of this shoal water about 0.5 mile N of Tanjong Po, and drying rocks extend a short distance SE from it.

A wreck, with a least depth of 12.5m, lies 10 miles NE of Tanjong Po.

Shoal water, with depths of less than 7.3m, extends from 3.5 to 5 miles offshore between Pulau Satang Kechil and Tanjong Sipang Peninsula. From Tanjong Sipang, the coast extends SSW for about 4.5 miles to Tanjong Tambak.

Foul ground extends up to 0.5 mile off this section of coast. Shoal water, with depths of less than 1.8m, extends in a WNW direction for about 1.5 miles, from Telok Penyok, a small bay

located about 3 miles SSW of Tanjong Sipang. Two detached 1.8m patches lie 0.5 mile and 1.3 miles WNW of the W extremity of this shoal water. These patches lie on either side of the fairway across the bar.

Between Tanjong Tambak and Tanjong Batuboya, which is located about 1.5 miles SSE, the coast recedes forming a bay that dries almost 0.3 mile from its head.

Batuan Tambak (Nap Rocks) (1°43'N., 110°18'E.), which dry 1.2m, lie 1 mile NW of Tanjong Batuboya.

Batuan Kera (Royalist Rocks) (1°43'N., 110°18'E.), which dry 1.2m, lie about 0.3 mile SW of the same point.

Pulau Kra (1°42'N., 110°18'E.), a small islet, lies on the S side of the entrance channel about 1 mile SSW of Tanjong Batuboya and is joined to the coast to the SE of it by a chain of rocks. This islet is rather difficult to distinguish from seaward.

11.9 Terumbu Salak (Rainbow Reef) (1°42'N., 110°18'E.), which dries, lies 0.35 mile NNW of Pulau Kra.

The bar of the Sungai Santubong has a depth of 1.8m. Its outer 5.5m edge lies about 6 miles NNW of Pulau Kra. This bar is possibly subject to change because of its sandy nature and because of the freshets that occur. It should not be attempted without local knowledge.

During the Northeast Monsoon, this entrance is not practicable because of the heavy swell on the bar. Inside the bar the depths increase rapidly, but there are several dangers between its entrance and its junction with the Sungai Sarawak.

Local knowledge is essential for vessels proceeding beyond Tanjong Batuboya.

Tides—Currents.—The flood sets E across the bar and the ebb to the W. In the entrance of the river the flood sets toward Royalist Rock. Close inside the river entrance the strength of both the flood and the ebb is increased.

There are usually two tides a day with the tidal range being 1.5 to 3.3m.

At the entrance of the Muara Tebas springs rise about 4.2m and the neaps about 3.4m.

Directions.—When approaching Santubong Entrance from the W, steer 131° for the peak of Gunung Santubong until Tanjong Sipang bears 072°, then steer 162° on the leading lights situated about 0.3 mile S of Pulau Kra. This course leads over the bar in a least depth of 1.8m.

When Tanjong Batuboya bears 103°, alter course gradually to the E and steer between the point and Batuan Kera. If entering with the flood, care should be taken to alter course in ample time to avoid being set onto these rocks and the rocks SW of it.

As local knowledge is essential for proceeding above Tanjong Batuboya, no further directions are given.

11.10 The entrance to Muara Tebas provides the most generally used entry to the Sungai Sarawak which leads to Kuching. The entrance lies about 1 mile E of Tanjong Po. There is an outer and inner bar.

Tanjong Selabat (1°40'N., 110°29'E.) lies 3.5 miles SW of Tanjong Po. A bay which lies in between is fronted by a mud and sand shoal extending 1.5 miles to the E and dries up to 3.6m.

An islet, 34m high, lies close off Tanjong Selabat. Two other islets, both about 15m high to the tops of the trees, lie 0.2 mile

SSE of Tanjong Selabat. Batu Menaul (Rocky Islet), 3m high, lies 0.5 mile SSE of the same point.

Tanjong Muara Tebas (1°39'N., 110°30'E.) lies 1.5 miles S of Tanjong Selabat. A small drying bay lies in between.

Gunung Ayer, 116m high, is the N hill on the above point. The beacon which stands on it is difficult to distinguish from seaward.

A rock, 3.7m high, lies close NNW of Tanjong Muara Tebas.

Caution.—It has been reported (1998) that a rock, with a depth of less than 0.2m, lies close NW of the Muara Tebas Entrance range line, less than 0.7 mile ESE of Tanjong Muara Tebas.

Beting Matong (1°44'N., 110°33'E.), a sandy spit with depths less than 5m at its N end and drying to the S, lies on the E side of the entrance in the N and S direction with its N end about 1.5 miles NE of Tanjong Po.

The outer bar, which is composed of hard sand, lies about 2 miles SE of Tanjong Po and 0.5 mile NW of the outer alignment of the entrance range. There was a depth of 5.2m over the outer bar. The least depth over Beting Matong, on the alignment of the outer entrance range, was 4.6m.

Caution.—During the Northeast Monsoon, an underwater clearance of at least 2m should be allowed when crossing the outer bar because of the swell.

11.11 Tanjong Embang (1°38'N., 110°31'E.) comprises the coastal area on the S side of the river about 1 mile SE of Tanjong Muara Tebas. A drying spit extends almost 1 mile NE from Tanjong Embang.

The inner bar is formed 1 mile E of Tanjong Muara Tebas. There was a depth of 4.6m on the range line leading over this bar.

Muara Tebas Entrance No. 1 Lighted Beacons, in range bearing 209.5°, lead across the outer bar. Muara Tebas Entrance No. 2 Lighted Beacons, in range bearing 247.33°, lead across the inner bar. The channel between the outer and inner bars, and the channel leading to Tanjong Pending is marked by numbered lighted buoys.

A detached 3.4m patch lies 0.5 mile ESE of Tanjong Muara Tebas and 137m NW of the alignment of the range leading across the inner bar.

Anchorage can be taken, by vessels waiting for the tide to enter the river, about 1.5 miles N of Tanjong Po in a depth of 9m.

McDougall Point (1°37'N., 110°27'E.) lies on the S bank of the Sungai Sarawak, 3 miles WSW of the inner bar. The river then follows a winding course to North Junction Point where it joins the Santubong branch.

Kampong Muara Tebas lies on the N bank 0.3 mile WSW of Tanjong Muara Tebas. A drying jetty is situated here.

Tanjong Batu (1°38'N., 110°28'E.) lies on the N bank about 2.3 miles WSW of Tanjong Muara Tebas.

Batu Jernang (Belcher Rocks), marked by No. 9 lighted buoy moored close E, with a depth of 0.2m, lie 0.5 mile SW of Tanjong Batu. A notice board stands on the NW bank of the river abreast of these rocks.

A bar, with depths of 5.5m or less, lies 0.5 mile S of McDougall Point.

Tanjong Renard (Renard Point) (1°35'N., 110°27'E.), on the W bank of the river, lies about 1.3 miles S of McDougall Point. A rock, with a depth of 4.3m and marked by No. 10 lighted buoy, lies 0.5 mile N of Tanjong Renard. A light is shown from No. 3 light-beacon standing on Tanjong Renard.

A submarine pipeline crosses the river in an ESE direction from Tanjong Renard.

Bukit Sejinkat, 85m high, stands 1.3 miles W of Tanjong Renard. Kampong Sejinkat, where there is a small pier, lies at the foot of this hill.

Beting Tanju, a shoal with a least reported depth of 2.7m, lies in the middle of the river S of Tanjong Renard and extends about 0.8 mile to the W. It is marked by No. 11 lighted buoy.

The entrance of the Loba Batu Blat lies between Tanjong Sedap and Tanjong Buaya 0.2 mile SW.

Tanjong Bakau lies 1 mile W of Tanjong Sedap; Batu Blat Reach lies in between. A bank, with depths of less than 1.8m, lies in this reach and extends 0.2 mile from the S bank. Another bank, with depths of less than 5.5m, extends 0.3 mile off the NW bank between Tanjong Batau and Pending Point.

Caution.—It has been reported (1998) that power lines, with an estimated vertical clearance of 61m, cross Sungai Sarawak in the vicinity of Tanjung Bako.

11.12 Kuching (1°34'N., 110°21'E.) ([World Port Index No. 51560](#)), the main commercial port and capital of the State of Sarawak, stands on the S bank of Sungai Sarawak, about 22 miles above the entrance.

The principal government buildings and the commercial facilities are situated near the center of the Main Bazaar, which extends along the riverfront behind the wharves and warehouses. Kuching is a first port of entry.

Tides—Currents.—Tidal heights above datum soundings are:

MHWS	4.8m
MHWN	4.1m
MLWN	1.6m
MLLW	1.1m

The ebb sets out of Sungai Kuap at a rate of 2 to 3 knots, and the flood sets in at a rate of 1.5 to 2 knots. Off Kuching, the ebb runs at a rate up to 3 knots at springs, but after a heavy rain it almost doubles this rate in the narrows. The flood off Kuching may attain a rate up to 1.32 knots. There is only a short period of slack water in the river.

When the height of HW at Pulau Lakei exceeds 4.7m, the flood continues to run at Kuching for 1 hour. In the entrances of the Sungai Sarawak, the rates of the currents are about 0.5 of those off Kuching. The tidal currents meet and separate near North Junction Point.

Depths—Limitations.—Sungai Sarawak, above Tanjong Pending, passes through Turnabout Reach, Prima Donna Reach, Horseshoe Reach, and Town Reach to Kuching. Vessels, with a draft of 5.2m, can navigate these reaches as far as Tanah Puteh Wharf, 2 miles below Kuching. Vessels of lesser draft can reach the berths at Kuching. It has been

reported (1997) that the river has been dredged and depths may be greater than charted.

A causeway has been constructed across Turnabout Reach about 0.7 mile above Tanjong Pending. Vessels no longer transit Turnabout Reach. Vessels now access Prima Donna Reach and points further upstream through the lock in the **Sungai Sarawak Barrage** (1°34.4'N., 110°24.3'E.) about 1.3 miles NE of Tanjong Pending.

Datuk Sim Kheng Hong Wharf, 260m long, lies close WSW of Pending Point. There are four berths, numbered 1 to 4 from the E. The wharf is equipped with mechanical cargo handling facilities. There are depths of 6.6 to 8.3m alongside.

Additional wharfage, with transit sheds and container area, continues SSW for 350m from the SW end of No. 4 berth. A light is shown from the SW corner of the additional wharfage.

There are six wharves on the S side of the river; Main Bazaar and Ban Hock Wharves are the only two available for ocean vessels. Main Bazaar Wharf is 244m long. It dries at the upriver end, but by using pontoons, vessels with a draft of 5m have berthed alongside.

Ban Hock Wharf is 68m long, with depths of 0.9 to 3.9m alongside. It was reported that this wharf was being extended.

The remaining wharves have depths of 1.2m alongside, but some dry at LW.

Biawak Oil Jetty No. 1, with a 48m long T-head berth across its face, extends from the shore about 0.3 mile above Pending Point. A dolphin stands off each end of this T-head. There is a depth of about 6.7m alongside the face. Tankers up to 110m in length with a loaded draft of 6.4m can be accommodated. Biawak Oil Jetty No. 2 lies 150m SE of Biawak Oil Jetty No. 1. The head of the jetty is 45m long with a depth of 6.7m alongside. A mooring dolphin lies on the NW and another on the SE of the jetty.

Tanah Puteh Wharf, which stands on the E bank of the river opposite Warren Point is 244m long, with depths from 2.9 to 5.6m alongside.

A dolphin stands off each end of the wharf and a ramp is provided for bow-door vessels.

Vessels berthed at this wharf may be fouled by floating and water-logged debris on the ebb tide, particularly after a heavy rain.

Pilotage.—Pilotage is compulsory but berthing is done during daylight hours only. The vessel's ETA should be sent 36 hours in advance; pilots should be requested 24 hours in advance.

Vessels are required to report to the Marine Signal Station at least 2 hours before arrival and are to maintain a continuous listening watch for pilotage and boarding information.

The pilot boards 1 mile NE of the light on Tanjong Po. During the Northeast Monsoon (October through March), the pilot boards at the intersection of the Tanjong Embang and Senari range lines.

Aspect.—Several silver painted oil tanks stand on the summit of Bukit Biawak, about 0.5 mile WNW of Tanjong Pending.

Regulations.—The following are extracts from the shipping regulations:

1. No vessels exceeding 80 nrt shall be underway in the Sungai Sarawak above Pending Point between the hours of

1930 and 0500 without the permission of the Director of Marine.

2. Powered vessels approaching Prima Donna and Dido Rocks, located about 1.3 and 3.5 miles, respectively, above North Junction Point, and when approaching a bend, shall give one prolonged blast on the whistle or siren.

3. Powered vessels exceeding 80 nrt may not overtake or pass another vessel in the Sungai Sarawak upstream of a point 0.5 mile E of Bintawak Rocks.

4. All vessels over 40 grt are required to anchor in the examination area off Kampong Sejinkat or if carrying dangerous goods in the explosives and dangerous cargo anchorage, and report their arrival to the Marine Signal Station at Pending; they must not proceed any further until permission has been granted.

5. Vessels transiting the Sungai Sarawak Barrage must contact "Kuching Barrage" on VHF channel 61 at least 1 hour prior to arrival and must monitor VHF channel 61 until being instructed by Kuching Barrage to enter the shiplock. Maximum vessel dimensions allowed in the shiplock are, as follows:

1. Length—95m.
2. Width—23m.
3. Draft (high water)—5.2m.
4. Draft (low water)—3.5m.
5. Air draft—12m.

Vessel speed in the shiplock is limited to a maximum speed of 0.4 knot.

Anchorage.—Anchorage for three vessels up to 11,000 dwt, 170m in length with a draft of 7.6m, can be taken off Kampong Sejinkat. Beacons stand on the banks to assist in the selection of a berth.

This anchorage is a main timber loading point; loading continues throughout the year. Vessels are not permitted to anchor off Pending Point.

An explosive and dangerous cargo anchorage extends 0.5 mile upriver from Tanjong Bako. Its limits are marked by beacons. This anchorage space is suitable for one vessel only with a length not exceeding 100m.

An examination anchorage has been established off Tanjong Sejinkat. Its limits are marked by beacons.

Vessels are recommended to anchor in the N half of the area. Shallow draft vessels should anchor as close to the N bank of the river as practicable.

A temporary examination anchorage is established on the E side of the bend in the river, opposite Tanjong Renard, between latitudes 1°35.05'N, 1°36.6'N.

Anchorage is prohibited between lighted buoy No. 11 and the NE limit of the explosives and dangerous goods anchorage, except for vessels loading logs under pilotage and vessels of less than 4m draft may be allowed anchorage at Beting Tanju.

Anchoring and fishing are prohibited between the explosives and dangerous cargo anchorage and the entrances of the Sungai Kuap and Turnabout Reach. The SW limit of the area is marked by beacons.

Anchorage is prohibited in Turnabout Reach, except in an emergency; at such time the Director of Marine should be notified immediately.

Anchorage is prohibited in the channel between the channel mark opposite Warren Point and Brooks Dockyard, except in

an emergency; at such time the Director of Marine should be notified immediately.

Directions.—When approaching Muara Tebas entrance from the W, pass on either side of Batu Samarang, but if passing to the S the spit extending 0.5 mile NE from Tanjong Buloh should be given a wide berth. In the early morning, the mist and fog banks may reduce visibility.

After rounding Pulau Lakei, steer to pass 1 mile E of Tanjong Po, then steer to cross the middle of the outer bar. When the lighthouse bears 304°, distance 2 miles, keep the outer lighted beacons in range, bearing 209.5° until the inner lighted beacons are in range bearing 247.3°. Keep on the alignment of this inner range which leads over the inner bar in a least depth of 4.6m.

To reach Kuching on one flood tide from the anchorage N of Tanjong Po, it is necessary to leave 3 hours before HW. It is advisable to arrive at Kuching 1 hour before HW if going alongside the wharves, because the turn can only be made on the flood.

Caution.—A good lookout must be kept for small tugs towing lumber rafts in the lower reaches of the river.

Considerable amounts of debris and large tree trunks may be encountered and should be given a wide berth if possible. When approaching the wharves, the whistle or siren should be sounded at frequent intervals to clear the numerous small craft and ferries out of the way.

A submarine cable crosses the river between Fort Maigherita and the opposite shore about 2 miles W of Warren Point. Each end is marked by a notice board. A pipeline crosses the river E of this cable. Similarly marked submarine cable crosses the river about 1 mile W of Warren Point.

Sungai Sarawak to Tanjong Sirik

11.13 From the E extremity of Tanjong Embang, 5.5 miles S of Tanjong Po, the coast extends S for about 3 miles to the mouth of the Batang Samarahan, and then in an E direction for about 11 miles to the entrance of the Batang Sadong. Shoal water, with depths of 7.3m and less, extends in a N direction from this section of coast for a distance of 7 to 10 miles. Drying flats extend from 1 to 2 miles offshore. Numerous fishing stakes exist within 3 miles of the coast.

Batang Sadong (1°34'N., 110°44'E.), which has an entrance about 2.5 miles wide, lies between Tanjong Piling (Tanjong Stok) on its W side and Tanjong Melaban on its E side. An extensive bar of soft mud, with a least depth of 0.6m in its center, lies across the entrance. After crossing the bar there are no known dangers in the river from its mouth to its junction with the Simunjan branch about 20 miles upstream, but a tidal bore occurs in the river at spring tides. Tidal currents in the river are strong, reaching a spring rate of 3.5 knots in the entrance and 5 knots off Simunjan. Numerous fish traps exist in the mouth of the river.

Simunjan (1°24'N., 110°45'E.), a small town standing on the E bank of the river, is fronted by a wharf.

From Tanjong Melaban, the coast extends in an ESE direction for about 9.5 miles to the mouth of the Sungai Sebuyau which discharges on the W side of the mouth of the Batang Lupar. Gunung Silabu, 436m high, and Gunung

Berdiri, 412m high, standing 5.32 miles and 8 miles SE of Tanjong Melaban are useful landmarks.

Sebuyau Village (1°31'N., 110°55'E.) stands near the coast about 9 miles ESE of Tanjong Melaban at the mouth of the Sungai Sebuyau. Two wharves, both concrete, one with 2.7m alongside and the other with 1.2m alongside, are situated abreast of the town.

A soft mud bar, with a depth of 1.2m, crosses the entrance of the Sungai Sebuyau.

A large amount of stone is quarried locally and shipped from this port. Vessels up to 63m in length, with a draft of 5m, have used the port.

Bukit Sebuyau (1°31'N., 110°56'E.), 168m high to the tops of the trees, stands 0.3 mile S of Sebuyau Village. A hill, 125m high to the tops of the trees, stands 1 mile W of Bukit Sebuyau and Bukit Bruang, 375m high to the tops of the trees, stands 2.5 miles WSW of Bukit Sebuyau.

Pulau Burong (1°38'N., 110°48'E.), an islet about 105m high to the tops of the trees, stands 3.32 miles NNE of Tanjong Melaban. A rock, 26m high, lies close NW off the island. Shoal water extends up to 6.5 miles N from this islet.

The E entrance point of the Batang Lupar is located about 5.5 miles NE of the 125m hill near Sebuyau Village.

Batang Lupar (1°31'N., 110°59'E.) is entered between the mouth of the Sungai Sebuyau and the above point.

Triso Darat, 119m high to the tops of the trees, stands on the E bank of the river, about 3 miles S of the E entrance point.

11.14 Pulau Triso (1°31'N., 110°59'E.), an islet 92m high to the tops of the trees, lies 0.5 mile WSW of Triso Darat. A rock, with a depth of less than 1.8m, lies 183m ENE of the islet, and a 3m patch lies 0.13 mile NW of Pulau Triso.

The bar, which consists of very soft mud and has a least depth of 1.8m, lies with its outer end about 18 miles NW of Pulau Triso. An obstruction lies on the bar about 3.3 miles NE of Pulau Burong. The depths are reported to be greater and the bottom softer on the SW part of the bar than on its NE part.

Tides—Currents.—At the entrance of the river the flood and ebb begin about 1 hour 50 minutes after LW and HW at Pulau Satang. The mean velocity of the flood is about 2.5 knots at springs and about 3.5 knots at ebb.

Pilotage.—Pilots for Batang Lupar and Batang Saribas can be arranged through Kuching. The pilot for Batang Lupar will board 1 mile NE of Tanjong Po Lighthouse. In bad weather pilots board E of Tanjong Muara Tebas.

Vessels, with a draft up to 5m, have entered the Batang Lupar at high tide.

The coast from the E entrance point of the Batang Lupar extends NNE for about 6 miles to Tanjong Edit (Tanjong Riong), the W entrance point of the Batang Saribas. Maludam Village stands on this point. Tanjong Batang Marow (Tanjong Batang Marau), the E entrance point of the Batang Saribas, is located about 6.5 miles NNE of Tanjong Edit.

Directions.—To enter the river from the NW, steer 160° for Pulau Burong and pass NE of it. Then steer toward the SW side of the entrance and pass SW of Pulau Triso. The channel to the E of this islet is subject to strong eddies.

Caution.—A large number of fishing stakes exist in the approach to Batang Lupar. The seaward ends of these stakes are of solid construction and care must be taken to avoid them.

The Batang Lupar, from Pulau Teriso to its junction with the Sungai Lingga, about 14 miles upstream, has depths of 3.7 to 7.9m. It flows through a dense jungle consisting mostly of mangroves and palm trees.

Navigation is hampered by tidal bores in the Batang Lupar and the Sungai Lingga. The largest bores occur 3 days after full and new moon, those occurring after the new moon being greater. The largest bores are usually first sighted just below Pulau Seduku, an islet mid-channel about 25 miles upriver from the mouth of the river, and travel about 40 miles farther upriver.

At times of very LW these bores have reached as far as 50 miles upriver from Pulau Seduku. In the large bores it is reported that the advancing wave attains a height of 2m when about 3 miles upriver from Pulau Seduku, and the speed of advance, which is dependent on the configuration of the river bed, is estimated to be about 10 knots at Simanggang, which is situated about 19 miles upriver from Pulau Seduku.

A wharf, a jetty, and a concrete ramp for use of bow-door landing craft are situated at Simanggang, 44 miles upstream from the river mouth. Vessels up to 36m and drawing up to 2m have entered the port, but it was necessary to utilize the flood tide in proceeding upriver.

Batang Saribas (1°43'N., 111°04'E.), entered between the two previously-mentioned points, is fronted by a bar which has a depth of 3m and a tidal range of up to 5.8m. Inside the bar the depths increase to 9.7m in the fairway. There is a minimum depth of 6.1m in the fairway from Pusa to Manggut. The tidal currents in the river are strong.

The Batang Saribas is over 100 miles long. Vessels with a draft of 1.5m can ascend to Betong, about 50 miles above the entrance.

11.15 Maludam Spit (1°42'N., 111°02'E.), a drying mud-bank, extends about 3.3 miles NW from Tanjong Edit, the W entrance point of the river.

Depths of less than 9.1m extend in a NW direction from the mouth of the Batang Saribas for about 15 miles. Shoal water, with depths of 5.5m and less, extends about 11 miles N and NW from Tanjong Batang Marow. A drying sandbank extends almost 2.3 miles N from this point.

A bank, with depths of less than 5.5m, extends 12 miles NW and W from Tanjong Batang Marow.

Three narrow shoals lie on this bank as follows: Pasir Dua Blas, which dries 0.3m at its S end, lies 7 miles NW of Tanjong Batang Marow and extends 6 miles NNW.

Beting Maro (Beting Marau), which lies 2 miles NW of Tanjong Batang Marow, dries 2.1m in its S part and extends 7.5 miles N.

Pasir Lomba-lomba, which lies midway between the above two shoals and 6 miles NW of Tanjong Batang Marow, dries 2.4m.

Breakers were reported NW of Pasir Lomba-lomba at LW and shoal water appeared to extend for several miles in that direction.

Tanjong Paloh (1°47'N., 111°06'E.), the S entrance point of the Sungai Krian, lies 2 miles NE of Tanjong Batang Marow. Tanjong Kabong, the N entrance point, lies about 0.5 mile farther NE. A conspicuous casuarina tree stands 0.3 mile NW of Tanjong Kabong.

The drying part of Kabong Sand, which lies on the W side of the entrance channel, extends 3.32 miles from Tanjong Batang Marow. Kuala Kabong, the entrance of the Sungai Krian, lies close N of Kabong Sand.

A shoal, with a depth of 1.2m, lies about 3.2 miles NNW of Tanjong Kabong. A stake stood on this shoal. A spit, with depths of less than 1.8m, extends from Tanjong Kabong to a position 0.5 mile E of the S end of the above shoal.

Lighted range beacons are situated about 2 miles NE and 4 miles NNE, respectively, of Tanjong Batang Marow. These ranges, which should be used only E of Betang Marow, lead into the Sungai Krian. These beacons are moved as necessary to conform to the changes in the channel. A depth of 1.5m could be entered into the river on the alignment of the above range.

Kabong, a fishing village and government station, is situated just inside the entrance on the N side of the river. A radio mast stands close S of the village.

The Sunagi Seblok, about 2.3 miles above Tanjong Kabong, has depths of 1.8 to 11.9m in the fairway for about 11.5 miles above its mouth.

Tides—Currents.—In the entrance of the Sungai Krian the ebb attains a rate of about 4.5 knots at springs and a rate of 4 knots at floods. In the deep channel on either side of Beting Marau the ebb sets N at a rate of 3.5 knots at springs, while the flood sets S at a rate of about 3 knots.

11.16 From Tanjong Batang Marow, the coast extends in a NNE direction for about 21 miles to Tanjong Selalang, the S entrance point of the Kuala Rajang. The land in the vicinity of this point is very low and densely wooded.

Tanjong Jerijeh (2°09'N., 110°11'E.), the N entrance point of the Kuala Rajang, is located about 4.5 miles NNW of Tanjong Selalang, and the Batang Rajang is entered between these two points. A light is shown from a 37m high, white metal framework tower standing 0.4 mile SSE of Tanjong Jerijeh. A wreck, with a depth of 3.3m and marked by a buoy, lies 3 miles SW of Tanjong Jerijeh; another wreck, with a depth of 5.9m, lies 2 miles W of the same point.

Batang Rajang (2°08'N., 111°13'E.) is navigable by vessels drawing 4m as far as Sibu, 70 miles above its mouth. There are two difficult bends between Sarikei, 27 miles above the entrance, and Sibu. One is at the junction of the Maura Payang, 4.5 miles above Sarikei, and the other is at the junction of Batang Leba-an, 19.5 miles above Sarikeu. The latter needs care and should not be attempted during the ebb. Because of shoaling in the vicinity of this bend, the size of the vessels using the Batang Rajang as far as Sibu was limited to 61m in length with a draft of 4m. Additional shoaling has taken place.

Vessels up to 8.8m draft have crossed the bar at the entrance of the Kuala Rajang, but this draft will only permit access to the deep-water anchorage at Tanjong Mani. Vessels of up to 2,000 grt proceed to Sarikei and Binatang, 11 miles above Sarikeu. A bar, 3 miles below Sarikei, limits the draft of vessels proceeding to Sarikei to 7m. Light-draft power vessels can proceed to Kapit, 90 miles above Sibu, which has been reached by a vessel 61m in length with a draft of 4.3m.

An overhead power line was reported to cross upstream 3 miles from Sibu; the vertical clearance and position are uncertain.

The route to Sibü via the Kuala Rajang entrance is generally used by smaller vessels trading from Singapore. Larger vessels normally use the Kuala Paloh entrance.

Tanjong Jerijeh Light, previously described, shows up well in the afternoon but is difficult to make out when the sun is in the E. The motor house, with an aluminum roof close to the lighthouse, shows up well and may be used for bearings without appreciable error.

Karang Jerijeh, also marked by a light, stands 2 miles SE of Tanjong Jerijeh.

Kuala Rajang is obstructed by shoals, which as defined by the 5.5m curve, extend up to 6 miles offshore to form a bar. A channel, with a least charted depth of 5.8m, leads across this bar into depths of 11m.

Bohari Bank (2°09'N., 111°06'E.), with a least depth of 2.1m, lies on the N side of the channel 2.3 miles W of Tanjong Jerijeh.

11.17 Wong Sands (2°06'N., 111°11'E.), which dry up into 4.3m, lie on the S side of the channel and extend 3 miles WNW from Tanjong Selalang. A depth of 2.7m lies almost 0.5 mile SW of the channel 6 miles WNW of the same point.

Fairway Lighted Buoy is moored at the entrance of the channel, 5.5 miles W of Tanjong Jerijeh. A stranded wreck which dries 1.2m, lies on Wong Sand, 2.5 miles WNW of Tanjong Selalang Lighthouse. Another wreck, with a depth of 3.5m, lies about 5.3 miles WNW of the same point. Another stranded wreck that dries 1m, lies about 4.3 miles farther W on the edge of Wong Sand.

Dangerous wrecks lie about 2.5 and 5.3 miles WNW of Tanjong Selalang.

Tides—Currents.—At springs, the N current attains a rate of 2 knots and the S current a rate of 1.5 knots in the vicinity of Fairway Lighted Buoy.

At Lighted Buoy No. 1, the ebb attains a rate of 3.5 knots and the flood a rate of 1.33 knots.

Pilotage.—Government pilots are boarded in a position between Lighted Buoy No. 2 and Lighted Buoy No. 4; other positions may be used if notified in the ETA message.

A request for their services should be made to "Shipping Sibü" and repeated to "Shipping Sarikei." The message should mention "Rajang Channel," and 24 hours notice is required. The pilot launch is equipped with radiotelephones.

A full time pilot is stationed at Sarikei, and the services of the Marine Officer, Sibü, are also available; at least 24 hours advance notice must be given to Sarikei and Sibü. Vessels should not proceed above the anchorage off Rajang without a pilot aboard because local knowledge is essential.

Kuala Rajang should be approached with Loba Ketan Lighthouse bearing 123°, passing close S of Fairway lighted buoy and N of Lighted Buoy No. 1y. A course can then be shaped for the pilot boarding area.

The town of Rajang stands on the N bank of the river about 5 miles E of the entrance and is fronted by a small jetty. A conspicuous sawmill stands close W of the town.

A jetty with a loading arm extends about 0.15 mile SSW from the sawmill. Mooring buoys lie E and W of the head of the jetty. Three jetties for small craft are situated close W of the sawmill jetty.

A stranded wreck lies on the S side of the channel, 0.8 mile SSW of the conspicuous sawmill. It is marked on its E side by a lighted buoy.

Caution.—At LW on a calm day, a scend of about 0.45m has been observed on the bar. Depths are subject to considerable change and great care should be used when navigating through this area. During the Northeast Monsoon (October to March), an underkeel clearance of 2m is recommended when crossing the bar.

11.18 Tanjong Sebulal (2°07'N., 111°19'E.), on the N bank of the river, lies about 5 miles ESE of Rajang.

Middle Bank (2°07'N., 111°19'E.), which consists of a group of drying mudbanks, extends about 1.3 miles WNW from a position about 0.3 mile WSW of Tanjong Sebulal.

Tanjong Mani (2°09'N., 111°21'E.) lies on the S bank of the river about 2.5 miles NNE of Tanjong Sebulal.

Mani Bank, which dries 1.5m, lies with its SW end about 1 mile SW of Tanjong Mani. It stands on a spit, with depths of less than 5.5m, which extends about 0.3 mile off the bank of the river between Tanjong Mani and the small stream close S.

Tides—Currents.—The tides at Rajang are semidiurnal, the average spring range being about 3.4m.

The mean tidal range at Sibü is 2.7m. However, actual levels vary with the fresh water flow in the river and at times of flood may rise 1.8 to 2.4m above predicted levels.

The flood at Rajang commences about 5 hours before HW and has a velocity of about 3 knots. The ebb commences about 1 hour after HW and has a velocity of about 3.3 knots. The velocity of the current alongside the wharf at Sibü is reported to be about 0.5 knot.

Anchorage.—The best anchorage for small vessels lies in mid-channel off Rajang, in depths of 9 to 12.8m, mud. Although the holding ground is good, the tidal currents are strong and the frequent squalls are heavy. Vessels are advised to veer an ample scope of chain.

Anchorage for deep-water vessels exists off Tanjong Mani. It can accommodate up to ten vessels at the same time, six up to 150m long and four between 90m and 120m in length; the holding ground is good.

The best anchorage lies from 0.25 to 0.35 mile S of the notice board about 0.65 mile N of Tanjong Mani. This anchorage is used by vessels loading timber whose size is only limited to those which can cross the bar.

11.19 North Jerijeh Sands (2°14'N., 111°10'E.), an extensive bank which dries in patches, extends 4.5 miles NNW from Tanjong Jerijeh.

Kuala Belawai (2°14'N., 111°09'E.), which can only be entered by small craft with local knowledge, lies between Tanjong Jerijeh and Tanjong Manat, about 4.5 miles NNE. This entrance leads into the Batang Belawal which connects with the Batang Rajang, and also with the Batang Paloh.

The entrance channel was found to lie 0.5 mile S of its charted position. A depth of 2.3m could be carried over the bar in a position about 3.3 miles WSW of Tanjong Manat. From this position the channel leads 090° to a position about 1.3 miles SSW of the point.

Approaching from the W, Tanjong Manat appears first as a line of trees with its S end considerably darker and denser than its other end. It forms a good landmark.

Manat Spit, which dries from 0.3 to 1.5m, extends 3 miles W from Tanjong Manat.

Kuala Paloh (2°26'N., 111°17'E.), the mouth of the Batang Paloh, is entered between Tanjong Pasir, about 17.5 miles NNE of Tanjong Jerijeh, and Tanjong Sedi. A bar, with depths of less than 2m, fronts Kuala Paloh between 1.5 and 9 miles NW of Tanjong Pasir. The bar is shallower than that fronting Kuala Rajang, but once crossed the river to Sibü via Muara Seredeng, Loba Semah, and Leba-an is easier to navigate and has fewer dangers.

This entrance is used almost exclusively by ocean-going vessels. The services of a pilot are recommended as he has knowledge of other ship movements in the river.

When the channel was opened, larger vessels have been able to reach Sibü. The limits imposed, 36 years ago, were drafts of 6.1m in summer and 5.2m during the Northeast Monsoon (October to March); although, 5.5m is occasionally acceptable at HW springs and after prior consultation with the pilotage authorities. Length is limited to 152m. These limits are revised from time to time.

Caution.—A stranded wreck, from which a light is shown, lies on the N side of the fairway 1.5 miles N of Tanjong Pasir.

11.20 Beting Osman (2°27'N., 111°13'E.), which dries 0.9m, lies on the S side of Kuala Paloh 1.5 miles NW of Tanjong Pasir. Depths of less than 1.8m extend 1.5 miles W from it.

Beting Mapal, Beting Timon, and Beting Bagus are three of several banks, which dry up to 2.8m, lying on the N side of the fairway from 1 to 5.5 miles NW of Tanjong Sedi. Depths of less than 1m extend 3 miles farther NW.

The approach channel is marked by two pairs of lighted buoys and passes S of a stranded wreck, marked by a light, lying 1.5 miles NNW of Tanjong Pasir.

At springs, the tidal current at the outer end of the approach channel runs N or S at a rate up to 2 knots. In the channel, the ebb current is 3.5 knots and the flood current is 1.8 knots.

While in the approach channel, care should be taken to avoid being set N on the ebb tide.

Anchorage for vessels awaiting a pilot is located at 2°30'N, 111°09'E. If the bar is crossed, there is good anchorage 0.3 mile S of Tanjong Sedi.

Pilotage.—Government pilots are normally boarded off Tanjong Sedi. Request for their services should be made to "Shipping Sibü". The message should mention Paloh Channel. A prior notice of 24 hours is required. If the pilot is required to board outside the bar, this should be stated in the message.

In 1994, the least depth across the bar was 2m. Strong cross currents, tidal currents and swell necessitate caution when entering especially during the Northeast Monsoon.

As local knowledge is necessary to navigate the river no further directions will be given.

Two pairs of lighted beacons in range, bearing 082.5° to 262.5°, stand at the junction of the Batang Paloh with the Muara Seredeng, about 12 miles upriver from Tanjong Sedi. These ranges indicate the fairway over the bar in a depth of 3.7m.

11.21 Sarikei (2°08'N., 111°32'E.) ([World Port Index No. 51583](#)), a small river port, lies on the S bank of the river about 27 miles above the mouth of the Batang Rajang. Vessels up to 3,000 grt and 79m in length can be accommodated.

The main wharf at the port consists of a T-shaped structure with a berthing face 60m in length, standing between two dolphins. It has a least depth of 7.6m alongside.

There is also a concrete pontoon, 30.5m in length, with a depth of 3m alongside. Two pontoons for launches with depths of 2.7m alongside are also available. A small jetty with shallow depths alongside is also available for launches.

A submarine water pipeline crosses the river in a N to S direction 0.45 mile NW of the mouth of Sungai Sarikei.

Binatang (2°10'N., 111°38'E.), about 11 miles upriver from Sarikei, is a small river port of some commercial importance.

The main concrete wharf at the port is 55m long with a depth of 4.5m alongside. Vessels up to 2,000 grt can be accommodated. Two short jetties with depths of 2.1m and 3.7m are also available.

Tide signals are displayed, as follows:

Signal	Meaning
Flag E	Ebb tide
Flag F	Flood tide
Flag S	Slack water

Sibü (2°17'N., 111°49'E.) ([World Port Index No. 51580](#)), situated about 70 miles upriver from the mouth of the Batang Rajang, is one of the principal ports of Sarawak and the residence of a government official. The town stands on a small island that lies near the confluence of the Batang Rajang and the Batang Igan. It is separated from the mainland by a small creek. Most of the principal offices are situated near the SE end of the town.

There are several wharves at Sibü. Main (Commercial) Wharf is 0.24 mile long with depths of 8.5 to 9.4m alongside and used for general cargo and container traffic.

Within 0.3 mile SE of Main Wharf there are four wharves, from 60 to 80m in length, with depths from 3.4 to 7.6m alongside.

The largest vessel to have used the port was of 7,372 grt and the deepest laden had a draft of 7.1m.

There are several floating wharves for launches.

Bukit Lima Wharf is 23m long with a depth of 4m alongside. A depth of 4.9m exists about 0.1 mile NNW of this wharf.

Anchorage.—Anchorage can be taken off Sibü, in depths of 8 to 11m, good holding ground.

Anchorage is prohibited in the area SE of the entrance of the Batang Igan.

There is restricted anchorage for loading and discharging of dangerous cargoes other than petroleum off the NE side of Pulau Kerto, which lies directly opposite Sibü.

Sungai Merah Oil Depot stands on the E bank of the Batang Igan 2.33 miles N of Sibü. There is a T-head wharf at the depot, 49m long, with a depth of 4.9m alongside. Small tankers up to 2,000 grt and 74m in length can berth alongside. Vessels should turn 0.5 mile above the wharf and berth portside-to, using an anchor.

11.22 Tanjong Sirik (2°47'N., 111°19'E.) the low and densely-wooded W entrance point of Muara Lasa, lies about 21 miles N of Kuala Paloh. The intervening coast is low and covered by jungle growth. It has been reported that the lighthouse, a 38m high metal framework tower standing 0.6 mile SW of the N extremity of Tanjong Sirik, was difficult to see by day from the W because of the trees.

The coastline in the vicinity of Tanjong Sirik was reported to be extending NW and N.

A bank, with depths of less than 5.5m, lies from 3 to 5 miles offshore between Kuala Paloh and Tanjong Sirik.

Drying flats extend almost 4 miles NNW from Tanjong Sirik Lighthouse; the bank, with depths of less than 5.5m, extends 7 miles N of the lighthouse. A visible wreck lies 3 miles W of the lighthouse.

Tides—Currents.—The tidal currents in the offing set NE and SW, but inshore they follow more closely the trend of the coast. West of Tanjong Sirik the currents set N and S at a rate of from 2 to 3 knots; E of the point the currents set E and W.

There are tide rips and overfalls near the shoals off the point especially with the N and E setting currents.

There is considerable indraft with the NE setting current into the rivers between the Sungai Sarawak and Tanjong Sirik.

Caution.—A dangerous wreck, the position of which is approximate, lies 10 miles N of Tanjong Sirik. Another dangerous wreck lies 25 miles NNE of the same point.

A dangerous wreck, the position of which is approximate, was reported to lie about 67 miles NNW of Tanjong Sirik.

Dangerous wrecks lie in positions approximately 4 miles NE, and 15.5 miles WSW, and an unsurveyed wreck with a depth of 25m lie 34 miles NNW of Tanjong Sirik. A shoal sounding a depth of 20m was reported to exist 25 miles N of the same point.

Tanjong Sirik to Tanjong Kidurong

11.23 From Tanjong Sirik, the coast extends in an ENE direction for about 110 miles to Tanjong Kidurong. Between Tanjong Sirik and the entrance of the Batang Balingian, which lies about 32 miles WSW of Tanjong Kidurong, the coast is low and wooded. A mudbank, with depths of less than 5.5m, extends from this section of the coast for a distance of about 2.5 miles. This mudbank has not been closely examined. About 8 miles SE of the mouth of the Batang Balingian there is a range of hills that extends in a SE direction. Table Hill is the most prominent peak of the group.

Kuala Bruit (2°47'N., 111°22'E.) and Kuala Matu are located close E of Tanjong Sirik and are the two mouths of the Muara Lasa, a large river that extends in a general S direction and joins the Batang Paloh, about 24 miles SSE of Tanjong Sirik.

Both river mouths are separated by Pulau Patok, a pear-shaped island about 2 miles long. Pasir Jungau, a drying shoal, extends about 2.3 miles NNE from the N end of the island. A bank, with less than 1.8m, extends 6 miles N.

Kuala Bruit had a least depth of 1.2m over the bar, which lies from 4.5 to 5.5 miles NNW of Pulau Patok. This channel is subject to change and should not be attempted, especially after the Northeast Monsoon.

Pasir Dua Belas (2°48'N., 111°26'E.), a narrow sandspit with depths of less than 1.8m and which dries in places, extends from 3 to 6 miles N of Tanjong Jol, the E entrance point of the Muara Lassa.

The main entrance of the Muara Lassa lies between Pasir Dua Belas and Pasir Jungau, and E of Pulau Patok. Two detached patches, with depths of 3.9m and 3.6m, lie in the entrance 1.5 miles NE and 1.32 miles ENE, respectively, of the N end of Pulau Patok.

A least depth of 3.4m could be carried over the bar of the main entrance, which lies 6.5 miles NNE of Pulau Patok.

Numerous detached shoals consisting of stiff clay and rotting vegetable matter, with depths of 2.1 to 4.9m, lie 0.3 mile E of Pulau Patok. These can be avoided by passing close E of the island where depths of 4.9m exist about 0.2 mile offshore.

Tides—Currents.—There are tide rips and overfalls over the shoals in the entrance of the Muara Lasa. The current runs strongly through the channels reaching a rate of 4 knots on the ebb after rains, close E of Pulau Patok.

Directions.—When close S of the bar, pass close W of a row of fish traps on a course of 190°. Then pass about 0.3 mile E of Pasir Jungau and 0.4 mile E of Pulau Patok.

The above fish traps stood about 8.3 miles N of Tanjong Jol, but they are subject to be moved or destroyed.

Muara Lasa is clear of dangers on its W side when S of Pulau Patok.

11.24 Batang Igan (2°51'N., 111°39'E.) is entered E of Tanjong Budu, about 19.5 miles ENE of Tanjong Sirik. The lighthouse which stands on Tanjong Budu was reported difficult to see from the NW by day. A dangerous wreck lies 1.5 miles N of Tanjong Budu.

Wrecks, with depths of from 0.2 to 0.5m, lie in the outer part of Kuala Igan. The approach channel over the bar is subject to frequent change. Leading lights with an alignment of 188° stand 0.5 mile WNW of the light close NE of which depths increase.

It has been reported that there are depths of 3.7 to 22m for 60 miles upriver to the junction of Batang Igan with Batang Rajang at Sibul. The channel has not been fully surveyed but vessels with a draft of up to 2.7m use the river regularly.

Igan Village stands on the E bank of the river 3 miles above the entrance.

Kuala Oya (2°53'N., 111°52'E.), the mouth of the Batang Oya, lies 13.5 miles E of Tanjong Budu. A clump of trees, 61m high to the tree tops, stand 3.5 miles W of Kuala Oya and are prominent when viewed from the N and E. A dangerous wreck lies 28 miles N of Kuala Oya.

A light is shown from the W bank of the entrance to Batang Oya. A beacon stands S of the light. In line, bearing 190°, the light and the beacon lead across the bar.

Drying sandbanks extend 0.3 mile NE from the W entrance point and 0.3 mile NNW from the E entrance point. In 1981, a bar with a least depth of 0.3m lay between N extremities of these sandbanks. The bar is subject to change.

The channel across the bar and into Batang Oya is marked by stakes and could be approached years ago, with a white beacon 0.65 mile W of the light, bearing 247° ahead. It has

been reported that vessels with draft of 1.8m can navigate this river as far as Kekan Village, 17 miles above the entrance.

Oya Village stands close within the river entrance.

11.25 Kuala Mukah (2°55'N., 112°05'E.), the mouth of Batang Mukah, is located 13.5 miles E of Kuala Oya. A narrow sandbank fringes the intervening coast. The several small rivers which discharge along this section of coast have no commercial importance.

Drying sandbanks extended 0.3 mile NNW from both entrance points of Batang Mukah. A depth of 0.2m could be carried between their extremities. The range leads across the outer part of the E sandbank, which just dries.

Dangerous wrecks lie 2 miles and 3.5 miles N of the entrance.

Vessels at anchor have loaded logs off Kuala Mukah, but the anchorage is exposed to the Northeast Monsoon.

A light stands on the W bank of the river about 0.5 mile with the entrance. The stakes which mark the fairway across the bar are moved as necessary.

Signals.—Tide and depth signals are displayed from the rear range beacon on the E and W yardarms, as follows:

Signal	Meaning
One white ball	Flood tide
One red ball	Ebb tide
Three white balls	2.1m or more on the bar
Two white balls	1.8m on the bar
One white ball	0.5m on the bar
No signal	Less than 1.5m on the bar
Note. —At night, red and white lights are displayed in lieu of the red and white balls.	

Mukah (2°54'N., 112°06'E.) stands on the W bank of the river. A radio mast stands at Mukah close WSW of the rear range beacon.

Government Jetty, with a depth of 5.5m alongside, stands on the W bank of the river 0.5 mile within the entrance. A short commercial wharf, with shallow depths alongside, stands 0.2 mile further upriver.

11.26 Kuala Bintulu (3°11'N., 113°02'E.), the mouth of Batang Kemena, lies about 58 miles ENE of the mouth of Batang Mukah. Several other rivers, including Batang Balingian and Batang Tatau, discharge into the sea between these two rivers but none is of any importance to shipping.

Bukit Setiam, 639m high to the tops of the trees, standing 14.32 miles SW of Kuala Bintulu, has a conspicuous summit and is a useful mark. Bukit Buan, 630m high to the tops of the trees, stands about 3.3 miles S of Bukit Setiam.

Bukit Ujan, 315m high to the tops of the trees, stands 10.5 miles ENE of Bukit Setiam. A dangerous wreck lies about 7.3 miles NW of Kuala Bintulu.

Aspect.—**Bukit Nyabau** (3°13'N., 113°05'E.), 220m high to the tops of the trees, standing 3.5 miles ENE of Kuala Bintulu is the highest and most prominent hill in the vicinity. A

conspicuous radio tower, 277m high and marked by an obstruction light, stands 0.3 mile ENE of Bukit Nyabau. A radio tower stands on the W bank of the river opposite Bintulu.

Tanjong Batu (3°12'N., 113°02'E.), which is fringed by drying rocks, lies 1.5 miles NE of Kuala Bintulu. Bukit Jepak, 79m high to the tops of the trees, stands on the SW side of Batang Kemena, about 1.3 miles from its entrance. A conspicuous radio tower stands near its summit.

In rainy weather, discolored water from the Batang Kemena extends several miles offshore. Large tree trunks are carried down by the river and may be a danger to navigation.

Depths of less than 5.5m extend about 1.3 miles NW from Kuala Bintulu.

A bar lies about 1 mile from the river entrance. It has been reported to be very unstable and mariners not having recent local knowledge were advised to obtain pilotage assistance. The shoal water on each side of the channel over the bar breaks.

Kuala Bintulu Lighted Range Beacons stand on the E side of the entrance are in line, bearing 098.5°. The front light is moved to indicate the deepest channel.

A wreck lies 0.6 mile NW and a stranded wreck 0.35 mile NNW of the front light structure.

The stranded wreck of a steel lighter, from which a light is shown, lies 0.5 mile WNW of the same light structure and close N of the leading line.

A drying mudbank extends about 0.5 mile NW from the W entrance point of the Kuala Bintulu. A drying sandbank extends 0.7 mile NW from the E entrance point. Rocks, which dry 1.2m and 0.3m, lie 0.15 mile and 0.3 mile S of Tanjong Batu.

Tides—Currents.—The flow in the river and immediate approaches is mainly due to the ebb in the surface layer. The maximum rate is 1.5 knots and the maximum ebb flow of 2.5 knots occurs midway between HHW at Miri and the following LLW. The maximum flood rate of 0.3 knot occurs midway between LLW at Miri and the following HHW.

In the immediate approaches, the ebb underwater is apparent in the movement of floating debris, but there is little movement below a depth of 0.3m.

Signals.—Tidal signals are shown from the NE yardarm of the rear leading light structure at the river entrance. One white ball represents the flood tide and one red ball for the ebb tide.

Depths signals are shown from the SW yardarm of the rear leading light, as follows:

Signal	Meaning
Three white balls	2.4m on the bar
Two white balls	1.8m on the bar
One white ball	1.2m on the bar
No signal	Less than 1.2m on the bar
Note. —At night, red and white lights are displayed in lieu of the red and white balls.	

Anchorage.—Anchorage can be taken, in a depth of 7.3m, good holding ground, about 2.3 miles NW of the front range beacon.

11.27 Bintulu (3°10'N., 113°02'E.) stands on the E bank of the river about 0.3 mile within the entrance. The principal berthing facility is 49m long with depths of 0.8 to 1.3m alongside. A new 450m container pier has been constructed.

Batang Kemena is navigable by any vessel with local knowledge that can cross the bar, as far as Tubau, 50 miles upriver. A bridge, with a vertical clearance of 11.8m, crosses the river about 3.5 miles upstream from the above mentioned berthing facility. The width of the navigation channel between the piers is 37m.

A shoal, with depths of 10 to 11m, lies 10.5 miles NE of Kuala Mukah. Its limits have not been defined. Depths of 11.9 and 11m lie 12 miles ENE and 13.5 miles E, respectively, of the above shoal, but they have not been examined.

Lydie Shoal (Beting Mukah) (3°51'N., 112°03'E.), a small coral patch with a depth of 34.7m, lies about 71 miles NW of Tanjung Kidurong.

Parsons Shoal (Beting Tugau) (3°54'N., 112°15'E.), with a depth of 20m, lies 12.32 miles ENE of Lydie Shoal. James Shoal (Beting Serupai), Beting Serupai, with a depth of 22m, lies 15 miles NE of the same shoal.

During the Northeast Monsoon (October to March), a distinct line of tide rips may be seen in the vicinity, particularly W of these shoals. Beting Tugau is marked by Beting Tugau Lighted Buoy. A shoal, with two heads having depths of 21m and 22m, lies 13 miles SSE of Parsons Shoal.

Beting Safri (3°34'N., 112°21'E.), a coral shoal with a depth of 16m, lies 6.5 miles farther S.

A dangerous wreck lies 19.5 miles SSW, and an obstruction lies 10 miles WSW of Beting Tugau. An obstruction, with a depth of 22m, the remains of an abandoned oil well, lies 21 miles S of Parsons Shoal.

11.28 Acis North Shoal (Beting Liku Utara) (3°46'N., 112°38'E.), with a depth of 16.2m, lies 39 miles NW of Tanjung Kidurong. Two detached shoals with depths of 16.1 and 21.5m, were reported to lie 6.5 miles and 9.5 miles NW of Acis North Shoal.

Another shoal, with a depth of 26.5m, was reported to lie 1 mile E of the 21.5m shoal. A shoal with a depth of 17.6m, was reported to lie 0.5 mile S of the 21.5m shoal. A 25m shoal lies 14 miles NW of Acis South Shoal.

Acis South Shoal, a ridge of coral extending for 2.32 miles in a NE and SW direction, lies 7 miles SSE of the N shoal. The least depth over this ridge is 9.1m near its center.

Marie Shoal (Beting Tatau) (3°41'N., 112°48'E.), with a least depth of 12.5m, lies about 29 miles NNW of Tanjung Kidurong. An obstruction, whose position is approximate, is charted 6.5 miles SSE of Marie Shoal.

Ruth Shoals (Beting Kidurong) (3°44'N., 112°55'E.), three detached patches, lie between 6 miles and 8 miles ENE of Marie Shoal. The E patch has a least depth of 10.7m. The other two patches have depths of 12.8m and 13.4m.

Isobel Shoals (Beting Jepat) (3°50'N., 112°48'E.), which consist of a coral ridge extending in a NE and SW direction, with a depth of 12.5m, and a shoal, with a depth of 11m, lie 10 and 14 miles, respectively, NW of Ruth Shoals.

Madalene Shoals (Beting Bintulu) (3°50'N., 112°47'E.), a large group of detached coral patches, extend about 6 miles

NNE to 15 miles N of the N end of Ruth Shoals. There is a least depth of 10.4m at the S end of this shoal.

Patricia Shoals (Beting Nyabau) (3°38'N., 113°03'E.), with a least depth of 9.1m, lies about 22 miles N of Tanjung Kidurong. Shoal patches, with depths of 13.7 to 18.3m, lie between this shoal and the 20m curve fronting the coast.

Wilson Shoal (Beting Nyalau) (3°47'N., 113°04'E.), with a depth of 15.2m, lies about 8.5 miles N of Patricia Shoal.

11.29 Christine Shoals (Beting Suai) (3°51'N., 113°02'E.), with the shallowest part having a depth of 10.4m, lie about 3.5 miles NW of Wilson Shoal. A dangerous wreck, whose position is approximate, lies 4 miles NNW of Christine Shoals.

Cochrane Bank (Permatang Payong) (3°49'N., 113°15'E.), having general depths of 15.5 to 18.3m, lies about 10 miles NW of Tanjung Payong. The bank is about 11 miles long in a NE and SW direction.

Elizabeth Shoals (Beting Bungai) (3°55'N., 113°10'E.), four attached coral patches with a least depth of about 9.7m, lie about 18 miles to the NW of Tanjung Payong.

Kenneth Bank (Permatang Mashor) (3°58'N., 113°22'E.) lies about 14 miles N of Tanjung Payong and has a least depth of 22m.

Ursula Shoals (Beting Niah) (3°58'N., 113°32'E.), a group of three shoals with depths of 3.7m, 8.5m, and 10.4m, lie between 12 and 15 miles NE of Tanjung Payong and 6 to 7 miles offshore. The NE and shallowest is steep-to and should be given a wide berth.

An offshore oil well with lighted platform (3°36'N., 112°23'E.) is situated 4 miles NE of Beting Safri shoal. A pipeline leads 10 miles SSW to Bayan Oil Field platforms. From Bayan Oil Field, the pipeline continues 28 miles SSE to Tamana-B Oil Field platforms.

Offshore production platforms of Tamana-A Oil Field and Tamana-B Oil Field lie 21 miles and 15 miles W, respectively, of Tanjung Kidurong. An oil pipeline is laid from Temana-A Oil Field to Temana-B Oil Field, then to the shore 1.5 miles NE of Tanjung Kidurong.

A gas pipeline from the central Luconia Gas Field lands 2 miles NE of Tanjung Kidurong.

Tanjung Kidurong to Tanjung Baram

11.30 Tanjung Kidurong (3°16'N., 113°03'E.) is located about 5.5 miles NNE of Kuala Bintulu. This point forms the N extremity of Telok Plan, a small bay that indents the coast for about 1.5 miles. A lighthouse stands about 10.2 mile ENE of Tanjung Kidurong.

Sheltered anchorage for small vessels may be taken during the Northeast Monsoon, in a depth of 5m, 0.3 mile SSE of Tanjung Kidurong.

Bintulu Offshore Terminal (3°20'N., 113°01'E.), consisting of a tanker mooring from which a light is shown, lies 4.5 miles NW of Tanjung Kidurong. An oil pipeline is laid from the shore 4.5 miles NE of the same point to the tanker mooring.

A recommended deep water track for deep draft vessels leads approximately 50 miles SE from a position 3 miles SW of Parsons Shoal (Beting Tugau) to Bintulu Harbor limits. Another deep water track leads about 23 miles SW and then

SSW from a position 9 miles NW of Tanjong Payong to the harbor limits.

The terminal can accept tankers up to 320,000 dwt, with a length of up to 305m and a sailing draft of 15.9m. The pilot and berthing master board at the pilot boarding area at the inner end of the traffic separation scheme.

Anchorage.—Anchorage have been established for general cargo vessels, vessels waiting to enter, LNG carriers, tankers and vessels carrying explosives. Their limits are best seen on the area chart. Advanced notice should be given 72 hours before arrival and then confirmed 6 hours and 3 hours before arrival. The use of a tug to assist with berthing and unberthing is compulsory.

Bintulu Port (3°16'N., 113°04'E.)

World Port Index No. 51585

11.31 Bintulu Port is situated on the S side of Tanjong Kidurong and contains an outer and an inner harbor.

The outer harbor facilitates LNG, LPG, and ammonia carriers. The inner harbor is for general cargo vessels. The port exports liquefied nitrogen gas LNG, palm oil, and fertilizers.

A major industrial development is in progress, and Bintulu port is expected to become the export capital of East Malaysia.

The harbor limit is defined by the arc of a circle drawn with a radius of 10 miles centered on Tanjong Kidurong.

A Traffic Separation Scheme is established in the outer approach, from the harbor limit to 4 miles inward, NW of Tanjong Kidurong. It was submitted for approval by IMO.

Depths—Limitations.—There are three general cargo berths on the N side of the inner harbor, totaling 514m in length, with depths of 13.5m alongside and suitable for vessels up to 30,000 dwt, and one berth for bulk carriers on the E side of the inner breakwater, with a depth of 13.5m and suitable for vessels up to 60,000 dwt.

A jetty used by construction craft is situated E of the general cargo berths. The area off it was dredged to a depth of 7m. A petroleum jetty SE of the inner harbor has a dredged depth of 11m alongside; berthing is suitable for vessels up to 10,000 dwt.

Aspect.—The approach channel to Bintulu Port is entered 4.5 miles W of Tanjong Kidurong. It is about 0.1 mile wide as far as a turning area, up to about 0.4 mile wide, just outside 15.5m at its outer end and increasing to 16m in the turning areas. Range lights, in line bearing 100°, lead along the approach channel as far as the LNG harbor.

The channel leading into the inner harbor is 120m wide and was dredged to a depth of 13.5m. Range lights, situated on the E side of the inner harbor in line, bearing 085°, lead through the entrance into the inner harbor.

The LNG harbor is protected by an outer breakwater extending 0.5 mile WSW and SSW from Tanjong Kidurong. A light is shown from the breakwater head.

The LNG jetty is 0.3 mile long and has a berth on each side. The berths and the approach to them have been dredged to a depth of 15m. The limits of the dredged area is marked by lighted buoys.

The inner general cargo harbor, E of the LNG Harbor, is entered between an inner breakwater on the N side and a reclaimed area on the S side. Lights are shown at each side of

the entrance. The inner harbor has a depth of 13.5m, except that the NE quarter is dredged to 7m and the SE quarter is dredged to 11m, apart from alongside the S side of the tanker loading jetty, which projects W from halfway along the E side of the inner harbor, where the depth is 13.5m.

Pilotage.—Pilotage is compulsory for vessels over 25m in length. Pilots board at 5 miles WNW of Tanjong Kidurong, near the inner end of the traffic separation scheme.

Anchorage.—Anchoring is prohibited within the harbor limit except in the designated areas that are for general cargo vessels, vessels waiting, LNG carriers, tankers, and vessels carrying explosives. The limits of these anchorages are portrayed on the charts.

Caution.—A dangerous wreck lies in the General Cargo Anchorage, 4.8 miles WSW of the Fairway Buoy, moored 4.5 miles W of Tanjong Kidurong.

11.32 Tanjong Batu (4°06'N., 113°48'E.) lies 68 miles NE of Tanjong Kidurong. This section of coast is low and featureless, but densely wooded with the trees extending to the HW line in most places. Gunong Subis, 413m high, which stands 18.5 miles S of Tanjong Batu, is the only natural feature which is readily identifiable.

The coast is flanked by a series of gently rising ridges, 305m high in places, which gradually diverge from the shore towards Gunong Subis. From this position they extend again toward the coast in the vicinity of Tanjong Batu. It is difficult to identify individual summits along this coast.

A number of rivers discharge into the sea along this section of coast, the most important being Batang Suai, Batang Niah, and Sungai Sibuti, about 26, 10, and 8 miles, respectively, SW of Tanjong Batu.

Any craft which can cross the bars can navigate the rivers without much difficulty, and they are extensively used for trade and communication by small coastal craft with local knowledge.

The river entrances are difficult to make out from seaward, the range beacons leading over the bars are, in most cases, the only indication of their positions. All have shallow bars, and the best crossing is usually indicated by stakes or range beacons, or both. In some cases lights are shown when vessels are expected. The depths and channels are constantly changing and entry should not be attempted without local knowledge.

On the ebb, and particularly after heavy rain, a surface layer of river water extends a considerable distance seaward from the rivers. Much debris is brought down, which includes large logs, and may constitute a danger to navigation. These may be encountered at any distance offshore. Off the mouths of the Batang Niah and Sungai Sibuti, the line of discolored water was encountered 10 miles offshore.

Patches of discolored water often give the impression of shallow water, and by contrast, there is rarely any visual indication of the off-lying shoals until the vessel is right over them.

After heavy weather, sand in suspension is found all along the coast up to a considerable distance offshore, and this again gives the impression of shallow water.

Anchorage.—Anchorage can be taken anywhere along this coast, provided charted shoals are avoided; the holding ground is generally good. The general nature of the bottom is soft gray

mud and sand, while the rocky shoals are covered with coral and sand.

Fishing boats will be met along this section of coast, but no fish stakes will be encountered.

Caution.—When navigating on this coast between Tanjong Kidurong and Tanjong Lobang it is recommended to stay in depths more than 18.3m, taking care to avoid the off-lying shoals and dangers.

Oil drilling rigs may be encountered along this section of coast. Some rigs are situated several miles offshore.

11.33 Kuala Similajau (3°32'N., 113°18'E.) lies about 20 miles NE of Tanjong Kidurong, and is an open bight protected on its N side by Tanjong Similajau and the coast to the SE. The Sungai Similajau discharges into the head of this bight.

Stag Point is the S entrance point of Kuala Similajau. A rock, with a depth of less than 1.8m, lies about 1.1 miles SW of Stag Point.

Tanjong Similajau, the N entrance point of Kuala Similajau, about 1.3 miles NNW of Stag Point, is fringed by rocky ledges which extend 0.3 mile offshore.

A drying rocky ledge extends 0.2 mile offshore from a position 0.35 mile N of Stag Point. White Rock (Batuan Putih), which dries 0.9m and constitutes the chief danger when entering the river, lies 0.15 mile WSW of this ledge. The drying spit extending NW from Stag Point almost extends to White Rock. The intervening ground is foul.

Basket Rock (Batuan Bakal) and Horn Rock (Batuan Tandok), with depths of less than 1.8m and on which the sea sometimes breaks, lie about 1.3 miles WNW and 1.5 miles W, respectively, of Stag Point.

James Reef (Terumbu Subis) (3°32'N., 113°15'E.), with a depth of 5.5m, lies 2 miles WSW of Tanjong Similajau. Mark Reef (Terumbu Pandan), with a depth of 4.9m, lies 1.32 miles W of the point. A 10.4m rocky patch lies about 0.6 mile farther W.

Jonah Shoal (Beting Semilajau) (3°33'N., 113°16'E.), with a depth of 6.4m, coral, lies 1.5 miles WNW of Tanjong Similajau. A 7.3m patch lies 0.5 mile WSW of this shoal.

Inner Shoals (Beting Dalam) are an area of foul ground, with many sunken rocks, which lie within 0.6 mile of Tanjong Similajau; a rock shoal, with a least depth of 3.4m, extends up to 1 mile NW from this point. A detached 5.2m patch lies 0.3 mile N of the 3.4m shoal.

The bar at Kuala Similajau consists of hard sand over rock, with a depth of 0.3m.

Anchorage.—Anchorage can be taken S of the parallel of White Rock, in depths of 10 to 11m. The bottom consists of soft gray mud, good holding ground.

Directions.—When approaching Kuala Similajau, keep outside about the 20m curve until due W of Kuala Similajau and then steer for the mouth of the river. Local knowledge is necessary for entering the river.

The ebb at the river entrance may increase from a normal maximum of 2 knots to as much as 4 knots after heavy rains. There is an abandoned lumber camp about 0.5 mile upriver which is fronted by a jetty, with a depth of 3.7m alongside.

Wiser Bay (Telukan Tubau) (3°35'N., 113°19'E.), shallow and 1 mile wide, lies 2 miles NE of Tanjong Similajau. The intervening coast is fronted by rocky ledges extending up to 0.2 mile offshore and backed by low sandstone cliffs.

An isolated rock, with a depth of 1.8m, lies 0.2 mile offshore in the middle of the bay.

Tanjong Bregum (3°38'N., 113°22'E.) lies 4.5 miles NE of Wiser Bay. Hills, up to 150m high to the tops of the trees, stand within 2 miles of the intervening coast.

Sungai Nyalau enters the sea 1 mile NE of Tanjong Bregum but has no commercial value. A small village stands on the S bank of the river near the entrance.

Tanjong Payong (3°44'N., 113°25'E.), low and rocky, stands 7 miles NE of Tanjong Bregum. It is low and consists of rocky outcrops and ledges. A rock, which dries 1.2m, lies 1.5 miles NE of Tanjong Payong and 0.4 mile offshore. A light is shown from a 9m high white, metal mast situated on Tanjong Payong.

Kuala Suai (3°48'N., 113°29'E.), the mouth of Batang Suai, lies 5.5 miles NE of Tanjong Payong. The least depth over the bar was reported to be 0.8m. Lighted range beacons lead up to the river entrance, but the channel markings should be used for crossing the bar.

The outer anchorage, 3.5 miles off Kuala Suai, is generally used by vessels loading logs.

Caution.—Caution should be observed in the event of sudden wind squalls from the W.

Only shallow draft local craft can enter the river and proceed to Suai, about 13 miles upriver.

11.34 Gunong Subis (3°48'N., 113°47'E.), 413m high, stands 22 miles ENE of Tanjong Payong. This peak is very conspicuous and can be seen for a great distance offshore. It is easily made out because of the white patches on its seaward side.

The coast from Tanjong Payong, almost to Tanjong Batu, is low, featureless, and bordered by a sandy beach for the whole distance.

Kuala Niah (3°58'N., 113°42'E.), the mouth of Batang Niah, enters the sea 16 miles NE of Kuala Suai. The bar of this river had a least reported depth of 0.4m. A clump of very high trees, close NE of Kuala Niah, is a good guide to the position of the river mouth.

The outer anchorage, 3.5 miles off Kuala Niah, has a depth of 9m and is usually used by vessels to load logs.

A pair of lighted beacons in range, bearing 125°, indicate the best channel across the bar. The rear daymark should be left open, left of the front daymark, about one-third the width of the triangle; the channel is unmarked.

The unmarked channel from the SW can be used by vessels with local knowledge, in about the same depth, but there is no range to steer on. A sand spit, marked at its outer end by a stake, extends from the S bank of the entrance. A stranded wreck lies off the entrance to Kuala Niah.

The river is navigable, by small craft with a draft of 1.8m, as far as Subis about 14 miles above the entrance.

Kuala Sibuti (3°59'N., 113°43'E.), the mouth of the Batang Sibuti, lies 2 miles NE of Kuala Niah. The bar across the entrance had a least depth of 0.2m. A clump of very high trees close N of Kuala Sibuti is a good guide to the position of the river mouth.

The outer anchorage, 3.5 miles offshore, has a depth of 9m and is usually used by vessels to load logs.

A pair of lighted beacons in range lead up to the approach, but the channel markings should be used to enter the river.

Only small craft with a draft of 1.5m can enter the river.

Fish Aggregating Devices have been reported to be moored about 4 miles offshore between Kuala Sibuti and Kuala Bakam. The positions of these devices are not charted.

Tanjong Batu (4°06'N., 113°48'E.) lies 8 miles NE of Kuala Sibuti. In this vicinity the coast is bordered by white limestone cliffs up to 24m high extending 4 miles along the coast. They are conspicuous from seaward but when the sun is high there are no prominent points for position fixing. The land above the cliffs rises steeply and forms a series of hills which rise gradually and extend NE toward Bukit Lambir, 464m high, about 13 miles ENE of Tanjong Batu. This peak is very conspicuous.

11.35 Tanjong Lobang (4°22'N., 113°57'E.), 18 miles NE of Tanjong Batu, has yellow cliffs, 30m high. Between these points the coast is covered with dense jungle.

Two conspicuous framework radio towers stand 0.5 mile and 0.65 mile E, respectively, of Tanjong Lobang. A light is shown from an 18m high, gray metal framework tower on Tanjong Lobang.

Siwa Shoal (4°16'N., 113°49'E.), with a depth of 5.2m, coral, lies 10.5 miles SW of Tanjong Lobang. Two patches, with depths of 8.2 and 10.1m, lie within 1.5 miles NNE of this shoal.

A small area of foul ground lies about 2.3 miles WSW of the 5.2m shoal. It was formerly the site of an oil drilling platform. A few pipes extend up to 1.5m above the sea bed in this position.

A shoal, with a depth of 2.1m, lies 4 miles WSW of Tanjong Lobang and a 2.7m patch lies 2.5 miles SW of the same point. Less than charted depths were reported between these two shoals. A detached 11m patch lies 4.5 miles W of Tanjong Lobang. Less water than charted has been reported to exist in this area.

A 17.7m coral patch lies 32 miles WNW of Tanjong Batu. An 18.3m bank lies 9 miles NE of this patch.

Takau Shoal, with a depth of 20m, lies 13.5 miles WNW of Tanjong Lobang.

Tides—Currents.—In the month of May, a WNW current is generally found offshore with a velocity of 1 knot. Close inshore the current sets SW.

Miri (4°32'N., 113°58'E.)

[World Port Index No. 51590](#)

11.36 Miri Roads is an open roadstead in a shallow bay contained within Tanjong Baram, 13 miles to the N, and Tanjong Lobang, 2.5 miles to the S. Miri, one of the principal towns in Sarawak, lies on the SE side of the Sungai Miri, discharging at 2.5 miles NNE of Tanjong Lobang. The town of Lutong lies 4 miles N, with offshore Lutong Oil Field lying 8 miles NW of it.

Miri includes the offshore loading berths at Lutong which serve the Sarawka Oil Field and the Brunei Oil Field.

Tides—Currents.—During the Southwest Monsoon, the offshore current sets steadily along the coast between Miri and Tanjong Baram to the N.

The currents are usually weak within 5 miles of the coast and the rate experienced was 0.5 knot, with rates of up to 2.5 knots being reported.

Depths—Limitations.—Between Tanjong Lobang and Lutong, depths of less than 5.5m extend about 1.3 miles offshore, and a depth of less than 11m extends up to 3 miles offshore. Wrecks, with depths of 5.3m and 3.4m, lie 3 miles NW and about 1.3 miles NNW of Tanjong Lobang. A stranded wreck, marked by a light, lies 0.7 mile WNW of the entrance to Sungai Miri.

A bar with a depth of about 0.3m extended across the entrance of the Sungai Miri. There is always a surf on the bar and a dangerous sea at times. Normally there is no swell in the offing during the Southwest Monsoon.

A cable-operated ferry connects Miri with the W bank of the river. All vessels should proceed at a moderate speed within the river, and when approaching the ferry to ascertain that it has reached one of the terminals before passing over the cable.

Customs Wharf, 44m long with a depth of 0.9m alongside, lies on the E bank of the river.

Immigration Wharf is 61m long with a depth of 2.1m alongside.

Coastal Wharf is 62m long with a depth of 2.1m alongside. There are also two small privately owned jetties.

Aspect.—A range of coastal hills, 91m high, extends 4 miles NNE from Tanjong Lobang. N of this range the land is low and densely wooded. A conspicuous tower stands 3 miles NE of Tanjong Lobang.

The oil tanks at Lutong, 7.32 miles NNE of Tanjong Lobang Lighthouse, are conspicuous. The oil tanks at Miri are prominent. At night the lights at the oil works are very prominent.

A radio tower, 67m high, stands 5.5 miles NNE of Tanjong Lobang.

Two conspicuous flares are occasionally visible in the vicinity of Lutong.

Pilotage.—Pilotage is compulsory for vessels using the oiling berths off Lutong. The berthing master and assistant, who are stationed at Miri, will board in the anchorage area. Berthing may be carried out both by day and night. A mooring launch is provided for berthing and unberthing; unberthing may be carried out without a berthing master. At least 24 hours notice is required. Messages should be sent through Radio Kuching.

Regulations.—Port of Miri Regulations copies may be obtained from the pilot when he boards.

Vessels entering the channel shall give way to vessels leaving the entrance allowing safe navigation in the center of the channel.

Vessels are required to establish communications on VHF channel 16 prior to leaving or entering the channel

Vessels for loading should anchor off Miri to embark a pilot who will take them to the moorings off Lutong. The pilot will provide mooring wires, a launch, and a gang of men to assist in mooring.

Under no circumstances should a vessel anchor off Lutong unless in charge of a pilot.

Vessels for quarantine should anchor as close to the mouth of Sungai Miri as safety permits.

Vessels with immigrants should anchor 3.5 miles NNW of Tanjong Lobang and 2 miles offshore.

Vessels entering the Sungai Miri must call at the Immigration Wharf for inspection, unless proceeding to the Customs Wharf.

Vessels entering the channel shall give way to vessels departing the entrance in such a manner to allow safe navigation in the middle of the channel.

Prior to entering or leaving the channel vessels are required to establish communications on VHF channel 16.

Anchorage.—Anchorage can be taken in a depth of 9m, 3 miles NNW of Tanjong Lobang. Loading and discharging of cargo is done by lighters from 25 to 150 tons capacity.

Vessels intending to proceed to the single point oil mooring berths off Lutong, should await the berthing master in the anchorage bounded by 4°23.7'N, 4°25.7'N, and 113°53.0'E, 113°55.0'E, and clear of the cautionary area.

When at anchor off Miri, even in a gale with high seas, vessels always lie head to the current with the swell on the beam. Swell often restricts work on the landside only.

Lighters can be provided for vessels handling cargo at the offshore anchorage area.

Directions.—When approaching Miri in thick weather and if unable to reach either anchorage, vessels are advised to anchor further W in depths of 18.3 to 22m, rather than remain underway.

When approaching the inner anchorage from the W, steer for the oil tanks at Miri, bearing 115°. In reduced visibility, keep in depths greater than 22m until Tanjong Lobang is sighted. At night, the oil tanks at Miri usually show up well.

The bar at the entrance of the Sungai Miri changes frequently and should only be crossed by vessels having small underkeel clearance and local knowledge. Channel changes are published in local Notice to Mariners.

Caution.—Two pairs of portable lighted range beacons stand on the S side of the entrance of the Sungai Miri. This side of the entrance had extended to the NW. These beacons are moved over a wide area to meet frequent changes in the channel and only indicate the approximate line of the fairway across the bar. Only the outer pair of range lights were reported in use. The best time to cross the bar is at HW. Vessels are advised to use a tug.

11.37 Takau Oil Field (4°25'N., 113°43'E.) is situated about 15 miles WNW of a pipeline. The pipeline connects Takau Oil Field and Siwa Oil Field. A dangerous wreck, marked by a lighted buoy close W, lies about 4 miles ESE of Takau Oil Field.

Siwa Oil Field (4°18'N., 113°48'E.) is situated about 8 miles SE of Takau Oil Field. Within the field are platforms from which lights are shown.

An oil pipeline extends 18 miles NW from the W part of West Lutong Oil Field to **Baronia Oil Field** (4°45'N., 113°45'E.), with a connection through **Bakau Oil Field** (4°34'N., 113°50'E.), situated 6.5 miles NW of Lutong Light.

11.38 Lutong (4°28'N., 114°00'E.) ([World Port Index No. 51600](#)) stands at the entrance of the Sungai Lutong, 7 miles NNE of Tanjong Lubong.

West Lutong Oil Field (4°30'N., 113°54'E.) lies in an offshore area, 7 miles W of Lutong.

Three SBMs, numbered 1, 3, and 5, lie 3 miles W, 3 miles WNW, and 6 miles WSW, respectively, of Lutong. Longer vessels of 125,000 dwt and a draft of 17m can be accommodated on No. 5 SBM, from which a submarine pipeline runs E to the shore.

The SBMs are lighted. Vessel's radio must not be used when moored to the SBMs.

Monsoon winds may cause interruptions to loading and vessels may have to vacate their berths at short notice. There are no tugs available.

Caution.—Special attention should be exercised by mariners navigating in the area where very large crude carriers maneuver under constraint conditions in the vicinity of the oil fields and in the offing of Lutong. Mariners are cautioned against anchoring in the area due to existing pipelines; some may be uncharted.

11.39 Betty Oil Field (4°37'N., 113°37'E.) is situated 20 miles W of **Tanjong Baram** (4°36'N., 113°58'E.).

Bokor Oil Field (4°33'N., 113°37'E.) lies 4 miles SSW of Betty Oil Field. Each field contains lighted production platforms. A pipeline runs from these platforms NNE to Betty Oil Field, another continues NE to Baronia Oil Field, while a third pipeline leads E to Bakau Oil Field.

A pipeline also connects between Bakau Oil Field and Betty Oil Fields. One platform stands 3 miles S of the main group.

Caution.—Vessels navigating in the vicinity of these oil well structures should exercise caution and avoid anchoring near the pipeline.

Tanjong Baram lies on the N side of Kuala Baram, the entrance of the Batang Baram, 14 miles N of Tanjong Lobang. The light which stands on the point, a grey metal framework tower, is difficult to make out from the N and W unless the sun is shining on it. A beacon stands 0.17 mile WNW of the light

A radio mast, from which red lights are shown, stands on the S side of the entrance to Batang Baram.

Tanjong Baram has been reported to be a good radar target at 15 miles and was reported to be identifiable with charted features at 12 miles.

Discolored water, in which large floating logs and other debris may be found, extends from 4 to 8 miles seaward from the mouth of the Batang Baram. The line of demarcation is usually very conspicuous.

A bank, with depths of less than 11m, extends 4 miles W and 5.5 miles N of Tanjong Baram. Depths of less than 1.3m extend about 2.3 miles WNW of Tanjong Baram; depths of less than 5.5m extend about 3.3 miles NW of the point. A sandspit extends about 2.3 miles WNW from Tanjong Baram, and is marked by several drying patches. The NW drying patch was reported to have extended SW. Two dangerous wrecks lie 4 miles NNE and 5 miles NW of the lighthouse on Tanjong Baram.

Numerous dangerous wrecks, some of which are marked by lights, lie on the bar as far as 2 miles W and about 3.3 miles WNW of the river mouth.

11.40 Baram Oil Field (4°40'N., 113°56'E.) spreads about 5.5 miles from E to W and two pipelines connect between the

two groups. A pipeline extends from less than a mile E of Tanjong Baram Light; leading from shore 8 miles NNW to an offshore platform situated on the E group of Baram Oil Field. From the W group, a pipeline leads about 9 miles WNW to Baronia Oil Field and another (gas pipeline) leads 11 miles SSE to West Lutong Oil Field.

Five lighted wellheads stand 1.5 miles N of the SW extremity of the above pipeline. A platform is situated 18 miles W of Tanjong Baram.

Currents N of Tanjong Baram set NE and ENE. In the vicinity of the point the current appears to be principally influenced by the winds.

Directions.—When approaching Tanjong Baram from the N, a berth of at least 6 miles should be given to the point. For directions to the S, refer to the information found under Miri.

The area E of Tanjong Baram should be avoided because of the numerous platforms and pipelines which exist.

Vessels loading logs during the Northeast Monsoon are advised to anchor about 4 miles SW of Tanjong Baram in depths of 9.1m.

11.41 Batang Baram (4°35'N., 113°58'E.) is entered through a bar which obstructs the Kuala Baram. This bar has a depth of 0.9m but it is subject to change. Vessels with a draft of 2m and local knowledge can enter the river at HW in good weather. A radio mast stands on the S side of the entrance to Batang Baram.

A stranded wreck, marked by a light, lies about 2.7 miles W of Tanjong Baram. Other stranded wrecks are best seen on the chart.

Depths over the bar at Kuala Baram are reported to shoal after the river has been low for a time particularly during the Northeast Monsoon (October to March), but deepen again after heavy rain inland. Logs may be found stranded on the bar.

Tanjong Baram lighthouse, bearing 105°, indicated the deepest water on the bar.

The shore on both sides of the entrance to the Batang Baram is covered with logs and stranded trees. Large quantities of timber are trapped on the upriver side of each jetty in the river. The entrance is difficult and should not to be attempted without local knowledge.

During a survey of the river, the flood was never observed, but the ebb attained a rate of 3 knots. After heavy rains the ebb may attain considerably greater rates.

Batang Baram is navigable for about 106 miles by vessels that can cross the bar.

Anchorage is prohibited in the vicinity of a pipeline and submarine cable crossing about 1 mile above the entrance.

A ferry crosses the river about 0.8 mile above the river entrance. Government Jetty, 27.5m long with a depth of 2.7m alongside, lies on the S side of the river close upriver of the ferry landing.

Marudi, a government station and the principal town of the district, is fronted by a wharf 22m long with a depth of 6.1m alongside. Several small jetties used by launches are available.

Off-lying Shoals and Dangers

11.42 South Luconia Shoals (5°04'N., 112°38'E.), consisting of a group of coral reefs, lie about 85 miles WNW of

Tanjong Baram. The group is steep-to, breaks in places, and can usually be seen from aloft.

Herald Reef (4°59'N., 112°37'E.) the S of the South Luconia Shoals, is a small coral head about 0.4 mile in diameter. It lies about 86 miles WNW of Tanjong Baram.

Depths of less than 2m exist on the head, with depths of about 55m near its center. This steep-to reef gives very little indication of its presence. A rock, with a shoal depth of 4.6m, lies approximately 11.5 miles SW of Herald Reef.

Stigant Reef (5°02'N., 112°29'E.), located about 9 miles WNW of Herald Reef, is horseshoe shaped, and has general depths of 4.6 to 11m. A 4.6m patch lies near the NW extremity of this reef.

Luconia Breakers, dry and on which the sea breaks heavily, lie about 3.3 miles NE of Herald Reef.

Richmond Reef, with a least known depth of 3.6m near its center, lies 2.5 miles NE of Luconia Breakers. It consists of a ridge about 2 miles long.

Comus Shoal, with least depth of 8.2m, lies about 13 miles E of the N part of South Luconia Shoals.

Connell Reef, with a least depth of 1.8m, lies about 6.5 miles NW of Richmond Reef. A 16.5m patch lies 4 miles E and a 5.5m patch 2 miles S of Connell Reef. A stranded wreck lies on the SW edge of this reef.

The area within the various reefs which comprise South Luconia Shoals has not been examined and there may be other reefs in this vicinity.

11.43 Central Luconia Gas Field (5°02'N., 112°40'E.) is situated 68 miles NNW of Tanjong Kidurong. A gas pipeline leads from the lighted platform (4°20'N., 112°41'E.) in the gas field to the shore landings at 2 miles NE of Tanjong Kidurong. From Central Luconia Gas Field, a gas pipeline connects to a lighted platform situated 24 miles NNW, and to another platform that lies 29 miles NW; a third gas pipeline extends ENE to **Baronia Oil Field** (4°45'N., 113°45'E.). Vessels should avoid anchoring within a mile from the pipelines.

North Luconia Shoals (5°30'N., 112°34'E.) consist of group of shoals and reefs which lie between 92 and 120 miles NW of Tanjong Baram, and from 14 to 50 miles N of South Luconia Shoals. They were partially examined many years ago and no safe passages were found between them. The channel between South and North Luconia Shoals and the area W of North Luconia Shoals have not been examined.

Hayes Reef (5°22'N., 112°36'E.), the S of the North Luconia Shoals, is a small, steep-to drying reef which breaks heavily in all kinds of weather. A shoal head lies about 2.7 miles E of Hayes Reef.

Seahorse Breakers, with depths of less than 2m, are steep-to on their E side. They lie about 10 miles NNW of Hayes Reef. A small drying patch, which breaks heavily, lies 2 miles W of Seahorse Breakers and a detached coral reef lies close S.

Tripp Reef (5°29'N., 112°30'E.), with a least depth of 3.7m, lies 8 miles NW of Hayes Reef.

Moody Reef (5°35'N., 112°23'E.), with a depth of 7.3m, lies 20 miles NW of Hayes Reef. Two dangerous reefs lie between Tripp and Moody Reefs and a 12.2m patch with a small reef close W of it, lies 3 miles NE of Moody Reef.

Hardie Reef (5°56'N., 112°32'E.), with a least depth of 5.1m, extends between 15 and 19 miles NNE from Moody

Reef. Another reef extends 8 miles S from the S end of Hardie Reef and has a depth of 5.4m. An unexamined dangerous reef lies 10 miles ENE of Moody Reef.

Buck Reef (5°52'N., 112°34'E.), with a least depth of 4.9m, lies about 15 miles NE of Moody Reef.

Aitken Reef (5°42'N., 112°33'E.), with a depth of 9.4m, lies 4 miles N of Buck Reef.

Friendship Shoal (5°57'N., 112°33'E.), the N of the North Luconia Shoals, has a least depth of 8.2m, but less depths may exist. This shoal lies about 26 miles N of Seahorse Breakers. Friendship Shoal has been reported to lie 3 miles W of its charted position.

Dangers Northeast of North Luconia Shoals

11.44 Louisa Reef (6°20'N., 113°14'E.), a steep-to coral reef about 1m high, is located 113 miles NNW of Tanjong Baram.

Caution.—A dangerous ground is known to abound within the line connecting the various positions. Vessels are cautioned not to pass through this area:

- a. 7°33'N, 115°25'E.
- b. 10°25'N, 117°50'E.
- c. 12°00'N, 117°50'E.
- d. 12°00'N, 114°50'E.
- e. 8°40'N, 111°30'E.
- f. 7°33'N, 111°30'E.

Royal Charlotte Reef (6°57'N., 113°36'E.), which is almost rectangular in shape, is located about 42 miles NNE of Louisa Reef. Several boulders, 0.6 to 1.2m high, lie near its SE side and some rocks awash lie on its NE side. An area of sunken dangers extends about 8 miles NNE from this reef and it was reported that it extends NW and SE. Breakers were observed over this reef.

Swallow Reef (7°24'N., 113°49'E.), located about 27 miles NNE of Royal Charlotte Reef, consists of a shallow basin surrounded by a narrow belt of coral. Several rocks, 1.5 to 3m high, lie near its E end and there are also several above-water rocks near its SE side. A stranded wreck lies near the W end of the reef. The rocks at the E end of the reef are plainly visible. The entire reef is marked by breakers and was reported to be larger in area than charted.

Swallow Reef has been reported to be a good radar target at 9 miles.

Dallas Reef (7°38'N., 113°51'E.), which dries, lies 5 miles W of Ardasier Reef. The reef entirely encloses a small lagoon, probably accessible to boats at HW.

Anchorage is not available in the area. A shoal, with a depth of 16.5m, exists in 7°35'N, 114°39'E, about 18 miles SE of Ardasier Bank. A bank, with a depth of 82m, lies 24 miles farther SSE.

Ardasier Bank (7°45'N., 114°14'E.), which has a least depth of 3.7m, lies 14 miles NE of Swallow Reef but has not been fully examined. This bank is about 20 miles long.

Tanjong Baram to Brunei Bay

11.45 From Tanjong Baram, the coast extends in an E direction for about 12 miles to the mouth of the Sungai Belait,

and then in an ENE and NE direction for about 28 miles to the mouth of the Sungai Tutong. This sector of coast is low, densely wooded, and intersected by numerous creeks. Shoal water, with depths of less than 5.5m, extends from 1 to 2 miles offshore.

Aspect.—Bukit Teraja (Mount Scott), a conspicuous isolated whale-backed mountain, 416m high, stands about 33 miles ESE of Tanjong Baram.

Offshore Drilling Operations

11.46 Caution.—Numerous production platforms, oil and gas pipelines, drilling and associated structures, gas vents, and other unlit obstructions exist up to 25 miles offshore between Tanjong Baram and **Champion Shoals** (5°12'N., 114°45'E.), and between Tanjong Baram and a position 15 miles E of Seria. Within this area are Fairley-Baram Oil Field, Gannet Oil Field, Fairley Oil Field, Southwest Ampa Oil Field, and Tali Oil Field (Seria Oil Field). At night, the wellheads and surface obstructions exhibit lights. The production platforms are brightly illuminated. The W platform on the Fairley Oil Field is fitted with a racon.

Oil and gas pipelines link within and between the oil fields. Vessels should avoid anchoring and trawling near the pipelines. A vessel damaging a pipe could face an immediate fire hazard.

In addition to the 0.27 mile radius around a structure, Brunei has declared Safety Zones up to 1.37 miles from the charted offshore platforms in the following areas:

Area	Location
Champion Oil Field	5°13'N, 114°45'E.
Magpie Oil Field	5°06'N, 114°27'E.
Fairley Oil Field	4°57'N, 114°06'E.
Southwest Ampa Oil Field	4°44'N, 114°09'E.
Fairley-Baram Oil Field	4°48'N, 113°58'E.

Mobile oil drilling rigs may be encountered off the NW coasts of Sarawak, Brunei, and Sabah, between 200m-contour and the shore. When on location moorings extend 0.33 mile from the rigs and they are usually marked by unlit buoys (yellow). At night the rigs display working lights. When under tow, the rigs display the proper lights.

Vessels should give a wide berth to these structures. If required to navigate in their vicinity, it is advised to reduce to a safe speed and proceed with caution.

11.47 Bukit Ambok (4°49'N., 114°40'E.), a high hill, stands near the N bank of the Sungai Tutong about 4.5 miles ENE of its entrance. This hill is fairly conspicuous in contrast to the densely-wooded country which surrounds it.

Gunung Mulu, one of the highest mountains in this part of Borneo, stands 68 miles ESE of Tanjong Baram. This conical-shaped mountain has a slightly flattened top and rises to a height of 2,407m. Several sharp-pointed conical peaks stand to the E.

Sungai Belait (4°35'N., 114°11'E.), whose banks are almost always flooded, had a depth of 0.6m on the entrance range over

the bar. Within the entrance there are general depths of 3.5m but the channel is obstructed by snags embedded in the mud. Only small craft can be accommodated within the river.

Kuala Belait (4°35'N., 114°11'E.), a town which has been developed as the headquarters of the Seria Oil Fields, stands on the E bank of the river just within the entrance.

A pair of range beacons, which indicate the best water over the bar, stand on the W side of the entrance of the river. These beacons are liable to be moved without notice.

A least depth of 0.7m at LW over the bar was reported to exist on the leading line. Waves break over the bar during onshore winds causing dangerous crossings for small craft.

Two wharves, one 0.17 mile long with a depth of 2.4m alongside, are situated about 0.3 mile within the bar. A government wharf, 91m long with a depth of 0.6m alongside, lies abreast the town 1 mile farther upriver.

11.48 Seria Oil Loading Terminal (4°37'N., 114°19'E.) (World Port Index No. 51645) is an open bay sea port situated 21.5 miles ENE of Tanjong Baram Light.

Depths—Limitations.—There are five piers at Seria. The E pier is 251m long.

Two SBMs are moored 6 miles N of Seria and are fitted with two floating hose strings. Maximum permissible drafts are 18.9m at mooring No. 1 and 17.4m at mooring No. 2.

Aspect.—Bukit Tunggulian, 128m high, stands 12 miles ENE of Seria. Bukit Tuan, 113m high, stands 1.32 miles farther NE.

Bukit Ambok, 76m high and covered with low scrub, lies near the N bank of the Sungai Tutong, 4.5 miles ENE of its entrance. It is fairly prominent in contrast to the densely wooded country which surrounds it.

The "gushers" of Seria Oil Field, which resemble pylons and are prominent, stand about 2 miles E of the village of Seria. Lighted drilling platforms lie up to 3.32 miles NE of Seria. Near Seria, several bright flares are visible up to 50 miles distant on a clear night

Pilotage.—A berthing master boards vessels bound for the SBM or LNG jetty off Kampong Lamut in the appropriate anchorage area.

There is a port radio station at Seria Oil Loading Terminal. Vessels should transmit their ETA 72 hours and confirm 24 hours in advance.

Extreme caution should be exercised when navigating in this area. Vessels should anchor only in the following quarantine areas which are indicated on the chart:

1. ALFA—2.5 miles NE of the Sungai Belait—for vessels using the port.
2. BRAVO—9 miles N of Seria—for vessels using the mooring buoys.
3. CHARLIE—10 miles NE of Seria—for vessels using the LNG Jetty.

Anchorage.—Anchorage is available for vessels calling at the SBMs N of Seria. A patch, with a depth of 4.9m, lies (between the SBMs and the shore) about 3.3 miles N of the piers at Seria. Anchorage is available for vessels calling at the LNG jetty at Kampong Lamut.

A liquid natural gas (LNG) jetty, 9.5 miles ENE of Seria and close NW of **Kampong Lamut** (4°40'N., 114°28'E.), extends 2.5 miles NNW from the coast.

Dolphins stand 91m E and W of the jetty head. Three mooring buoys are laid in an arc 0.25 mile to seaward and a buoy is moored about 0.3 mile ENE of the jetty head.

The depth alongside is about 9m. Tankers normally berth stern to the jetty head, using the dolphins for stern moorings. Bow ropes are secured to the mooring buoys. The berth is not tenable in all weathers. Vessels may approach the berth from either E or W.

A wreck, with a least depth of 17.6m, lies about 1.3 miles NW of the head of the LNG jetty. A 4m patch lies about 2 miles SW of the jetty head.

Sungai Tutong (4°47'N., 114°36'E.) lies with its entrance 20 miles ENE of Seria. There was a depth of 0.6m over the bar, but it is continually shifting. A light is shown from the SW extremity of the spit of land forming the N bank of the river mouth.

Vessels able to cross the bar can ascend to Dixon Reach about 14 miles upriver.

Tutong Village stands on the N bank of the river 6 miles above the entrance. A customs house is situated in the village.

Off-lying Dangers

11.49 Brock Patch (4°46'N., 114°30'E.), with a depth of 3.7m, lies 5 miles W of the mouth of the Sungai Tutong and 3 miles offshore.

Browne Patch (4°54'N., 114°18'E.), with a depth of 5.4m, lies 17 miles N of Seria.

Chearnley Shoal (4°51'N., 114°19'E.), with a depth of 5.2m, lies 3.5 miles SSE of Browne Patch.

Fairley Patches (4°56'N., 114°20'E.), a narrow shoal ridge with a least depth of 6.4m, lies 4 miles N of Chearnley Shoal.

Porter Patch (4°54'N., 114°24'E.), with a depth of 11m, lies 5.5 miles NE of Chearnley Shoal.

Ampa Patches, marked by a light, lie from 1.5 miles to 5 miles ENE of Fairley Patches. The light was reported extinguished.

Magpie Rock (4°57'N., 114°22'E.), a patch with a least depth of 4.6m, lies on the shallowest part of these shoals. There are several other patches with depths of less than 9m.

Several shoals, with depths of 9 to 18m, lie within 1 mile W and 1.5 miles SW of Ampa Patches.

An ammunition dumping ground, bounded by 5°25'N, 5°40'N, and 114°00'E, 114°16'E, lies centered about 39 miles NNW of Ampa Patches.

From the entrance of the Sungai Tutong, the coast extends about 19 miles NE to Brunei Cliffs which are about 24 to 27m high, and consist of white sand and short grass.

11.50 Pulau Punyit (4°58'N., 114°51'E.), an islet 18.3m high, lies about 0.5 mile NW of Tanjong Punyit, a point of land close E of Brunei Cliffs. This islet is almost joined to the point by a rocky ridge. A rock, awash, lies about 0.2 mile NW of the islet.

The coast between the Sungai Tutong and Pulau Punyit is sandy and backed by dull reddish cliffs about 12 to 18m high.

High casuarina trees stand on some of the beaches and near the mouths of the small rivers.

The Binturan Firing Range limit is marked by Lighted Beacon B1 (4°53'N., 114°40'E.) and Lighted Beacon B2, situated about 5.5 miles NE of Lighted Beacon B1.

From Brunei Cliffs, the coast extends 14 miles ENE to Brunei Bluff where the cliffs are 11m high and the tops of trees are 30m high. Shoal water, with depths of less than 5.5m, extends about 0.5 to 1.5 miles from the coast between the Sungai Tutong and Brunei Bluff.

Aspect.—Bukit Menteri Kedayo (Woody Peak), 138m high and located about 2.3 miles SW of Brunei Cliffs, is the highest peak of a range of hills, 76 to 138m high, which parallels the coast about 1 mile inland.

Bukit Sabandar (Jerudung) (4°56'N., 114°51'E.), a grassy ridge with numerous indistinguishable sharp peaks from 119 to 143m high, extends 4 miles S from Brunei Cliffs. Close E of this ridge the coastal range of hills, 61 to 109m high and densely wooded, stretches ENE to Brunei Bluff.

Bukit Cowie (5°02'N., 115°03'E.), more than 61m high, stands 0.3 mile S of Brunei Bluff.

For landmarks SW of Brunei Bluff, see the principal description of the W side of Brunei Bay.

Off-lying Dangers

11.51 Victoria Patches (4°55'N., 114°39'E.), consisting of a number of coral shoals with depths of less than 5.5m, lies from 3 to 4.5 miles offshore. The shallowest patch, with a depth of 2.7m, lies 8.32 miles NNE of the entrance of the Sungai Tutong.

Scout Patches (4°56'N., 114°38'E.) consist of two shoals: **Scout Rock** (4°56'N., 114°39'E.), with a depth of less than 1.8m, lies on the SE shoal 10 miles NNE of the entrance of the Sungai Tutong; the NW shoal, with a depth of 6.4m, lies 1.5 miles NW of Scout Rock.

Cunningham Patch (4°59'N., 114°38'E.), with a depth of 6.4m, lies about 3.3 miles NW of Scout Rock. Blunt Rock, with a depth of 4.6m, lies 2.32 miles NNE of Scout Rock.

Brunei Patches (5°01'N., 114°42'E.) consist of several shoals with depths of less than 5.5m. The shallowest spot, a rock with a depth of less than 1.8m, lies on the northeasternmost patch, 7.5 miles WNW of Pulau Punyit.

A dangerous wreck lies 1 mile SW of this rock. Another wreck, with a depth of 11m, lies 2 miles WNW of the rock.

Amcotts Rock (5°02'N., 114°37'E.), with a depth of 8.2m, lies 14 miles WNW of Pulau Punyit. A 10.1m patch lies 2.3 miles ESE of this rock and a 11m patch lies the same distance E of the same rock.

11.52 Iron Duke Shoals (5°06'N., 114°38'E.) consist of three distinct shoals: Otterspool Rock, the southernmost, with a depth of 4m, lies 13 miles NW of Pulau Punyit; Nankivell Rock, with a depth of 8.2m, lies 2 miles NW of Otterspool Rock; and Silk Rock, with a depth of 9.1m, lies 2.5 miles NE of Nankivell Rock.

Littledale Shoal (5°06'N., 114°46'E.), with a depth of 7.6m coral, lies 9 miles NNW of Pulau Punyit. Colombo Shoal, with a depth of 7.3m, lies 7 miles farther NNW.

Champion Shoals, consisting of two groups of shoal heads, lie 13 miles NNW of Pulau Punyit and extend 2 miles N. The S group has a depth of 6.4m, and the N group has a least depth of 8.2m.

Champion Oil Field (5°14'N., 114°45'E.), production platforms and wellheads, from which lights are displayed, are situated between 1 and 2 miles NNW of the N group of Champion Shoals. An underwater wellhead, with a depth of 27m, is situated 3.5 miles NNW of the N group of the Champion Shoals. Numerous oil structures and pipelines exist in the vicinity of Colombo Shoal and Champion Shoal. Mariners should avoid the area if possible. Mariners required to enter the area should navigate with extreme caution and should only anchor within the charted anchorages. The platforms which stand in this area have been reported to be radar conspicuous.

One of the structures in the oil field is fitted with a racon.

Two Fathom Rock (5°06'N., 114°58'E.), with a depth of 3m, coral, lies about 6.3 miles WNW of Brunei Bluff. A 4.6m patch lies 1 mile WNW of this rock. A detached 9.1m patch lies 0.3 mile N of the same rock.

A dangerous wreck lies 5.5 miles SW of Two Fathom Rock and another dangerous wreck, whose position is approximate, lies 1.5 miles SSW of Two Fathom Rock.

Approaches to Brunei Bay

11.53 The entrance of Brunei Bay lies between Brunei Bluff and Tanjon Klias, 23 miles NE. The islands of the Labuan Group, of which Pulau Labuan is the largest, stretch across the entrance and divide it into two channels, one S and one E of these islands. The channel E of the islands is known as East Channel.

Pulau Labuan (5°20'N., 115°13'E.) lies 13.5 miles NNE of Brunei Bluff and 4.5 miles W of Tanjong Klias. This densely wooded island is roughly triangular in shape and rises to the height of 102m in its N part. Most of the S part of the island is low, marshy, and intersected by streams. When viewed from the N, the island appears as two peaks.

Tanjong Kubong (Bethune Head) (5°24'N., 115°15'E.), the N end of the island, is 6m high. Foul ground, with rocks awash and on which the sea occasionally breaks, extends 2 miles N from the island. A light is shown from a 24m high, white metal framework tower.

Tanjong Layang Layangan (5°21'N., 115°12'E.), a cliffy headland 24m high, lies 4.32 miles SW of Tanjong Kubong. A prominent islet, 9.1m high, lies 0.5 mile SW of the headland.

Tanjong Punei (5°15'N., 115°10'E.), the SW extremity of Pulau Labuan, lies 6.5 miles SSW of Tanjong Layang Layangan.

The W coast of Pulau Labuan consists of sandy beaches fronted by rocks and coral reefs which extend from 0.5 to 1 mile offshore.

A range of hills rising to an elevation of 102m and grass-covered, runs parallel to the coast between Tanjong Kubong and Tanjong Layang Layangan. A densely wooded range of hills extends NE from Tanjong Punei. Bukit Kalam, 83m high and on which the tops of the trees attain an elevation of 90m, is the northernmost and highest hill of the range; it stands 5 miles

NE of Tanjung Punei. Bukit Timbalai, 71m high with a single tree on its summit, stands 2.5 miles NE of Tanjung Punei.

Rocky reefs, some above-water, extend 0.3 mile from Tanjung Punei. A wreck, with a depth of 18m and whose position is approximate, lies 9.5 miles of Tanjung Punei.

11.54 At Labuan Offshore Terminal (5°16'N., 115°07'E.) (World Port Index No. 51683), tankers up to 230,000 dwt and 22.5m draft can be taken to the SBM, moored about 2.3 miles WNW of Tanjung Pandan. The least depth in the maneuvering area is 25.6m. Submarine oil pipelines extend from the terminal to the buoy and to **Samarang Bank** (5°35'N., 114°55'E.).

Another pipeline connects Labuan shore terminal to **Barton Oil Field** (6°50'N., 116°20'E.), leading through; South Furious Oil Field, Saint Joseph Oil Field, Erb West Oil Field, and **Ketam Oil Field** (6°06'N., 115°36'E.).

A vessel bound for the SBM should radio her ETA to "Crosfield, Labuan," via Singapore coast radio station, at least 48 hours in advance. There is a port radio station at the oil terminal. Vessels must not use their main radio when berthed at the SBM.

A tanker anchorage area, 2 miles in diameter, is established with its center 5.32 miles W of Tanjung Punei. A berthing master boards at the anchorage. Berthing is carried out on a 24-hour basis. There are no facilities at the terminal.

Caution.—Numerous fairly shoal patches lie within an area extending 12 miles WNW to 12 miles NW of Bethune Head.

Glazer Rock (5°27'N., 115°04'E.), with a depth of 9.1m, coral, lies 12 miles WNW of Tanjung Kubong.

Four Fathom Patches (5°27'N., 115°13'E.), consisting of several small shoals with a least depth of 7.3m, lie about 3.3 miles NW of Tanjung Kubong.

A shoal, with a least depth of 3.7m, lies 3.5 miles W of Tanjung Kubong. Other shoal patches lie within about 1 mile of this least depth.

These shoals and dangers are all steep-to. Others may exist and great caution should be exercised when navigating in these waters.

Other shoals lie 15 miles N and NW of Tanjung Kubong.

Islands and Dangers Southwest of Pulau Labuan

11.55 Pulau Keraman (5°14'N., 115°08'E.), 58m high to the tops of the trees, lies 2 miles SW of Tanjung Punei, from which it is separated by Keraman Channel. The island is mostly fringed by drying reefs and foul ground extends up to 0.5 mile offshore in places.

A light is shown from a 15m high white tower with a red cupola situated on the summit of Pulau Keraman.

A wreck, with a least depth of 2m, lies 3.3 miles WSW of the lighthouse.

Undaunted Rock (5°14'N., 115°08'E.), with a depth of 3.7m, coral, lies in mid-channel between Tanjung Punei and Pulau Keraman.

Keraman Channel should only be used by those with local knowledge. Undaunted Rock is unmarked.

Pulau Rusukan Kecil (5°12'N., 115°09'E.), 46m high, lies 1 mile SSE of Pulau Keraman. A reef, with depths of less than 1.8m, extends about 1 mile SE from this islet.

Pulau Keraman and Pulau Rusukan Kecil lie on an extensive bank, with depths of less than 5.5m.

A reef, which dries 0.9m, lies 1.5 miles W of Pulau Rusukan Kecil.

A detached 8.5m shoal lies 0.5 mile ESE of the SE extremity of Pulau Keraman.

Pulau Rusukan Besar (5°11'N., 115°08'E.), marked by a prominent clump of trees, lies 0.3 mile SSW of Pulau Rusukan Kecil. Rocks and reefs surround this islet; a low rock lies 0.3 mile SSW of its SW extremity.

A shoal, with a depth of 2.7m, lies 1 mile ESE of Pulau Rusukan Besar; an 8.2m patch lies a close S of this shoal.

A shoal, with a depth of 6.7m, lies about 1.3 miles WSW of Pulau Rusukan Besar. A 6.7m coral patch lies 1.32 miles S of this island.

Barat Banks (5°10'N., 115°06'E.) are two shoals consisting of coral and sand. The NE bank, with a depth of 4.1m, lies 3 miles SW of Pulau Keraman. The SW bank, with a depth of 4.6m, lies 0.3 mile farther SW.

Barat Banks are separated from Pulau Rusukan Besar by a channel, with a least depth of 6.7m in the fairway, but this channel should not be attempted without local knowledge.

Two wrecks, with least depths of 11.9 and 12.8m, respectively, lie 1 mile SSW and 1 mile SW of the SW bank.

Abana Rock (5°06'N., 115°04'E.), with a depth of 5.5m coral, lies on the S side of the channel about 3.3 miles N of Brunei Bluff. A buoy lies close NW of the rock.

Pelong Rocks (5°05'N., 115°03'E.) are a group of sandstone rocks which lie 2 miles N of Brunei Bluff. The largest rock is 12m high. Coral reefs extend 0.3 mile N and 91m SW from the highest rock.

Depths of less than 3m extend 0.37 mile N and 0.27 mile SE from the rock.

A light is shown from a 12m high aluminum framework tower situated on the S summit of Pelong Rocks.

Both Pelong Rocks and Brunei Bluff are prominent when viewed from the outer bar at Muara.

11.56 Directions.—When approaching Brunei Bay from the W, the off-lying dangers E of Tanjung Baram should be given a wide berth and the channel S of Barat Banks should be approached on a course of 120°. Then steer to pass between Barat Banks Lighted Buoy and Abana Rock on an E course. Bukit Menteri Kedayao (Woody Peak), Bukit Tempayang Pisang, and Pulau Keraman can easily be identified.

In thick weather keep in depths of more than 46m to ensure passing outside all dangers. Vessels working against the monsoons will find the tidal currents more regular inshore, but with the E current they should guard against the set into the several coastal rivers.

Pulau Labuan—South Coast

11.57 Richardson Point (5°15'N., 115°10'E.) lies 0.5 mile ESE of Tanjung Punei.

A detached shoal, with depths of 10.1 to 11m, lies between 0.3 and 1.32 miles S of Richardson Point.

Pulau Burong (5°14'N., 115°11'E.), which is bare, lies 1.5 miles ESE of Richardson Point and close within the edge of a bank.

It has been reported to be only about 3m high, a large quantity of material for reclamation having been taken from it.

An obstruction, with a depth of 6.4m, lies about 1.3 miles ENE of Pulau Burong. A detached 9.1m patch lies about 0.3 mile SSW of the islet.

Tanjong Rancha Rancha (Hamilton Point) (5°15'N., 115°14'E.), now within an area of reclaimed land which rises abruptly to a hill 34m high, is located 4.3 miles E of Richardson Point; the bay which lies in between the two points is fouled by numerous rocks and banks which extend 0.5 mile outside a line joining the entrance points.

The three small rivers which discharge into the head of the bay have no commercial value.

Pulau Enoe (5°15'N., 115°14'E.), once an island, is now connected to the shore by reclaimed land which forms a peninsula extending 0.9 mile SSE from Tanjong Rancha Rancha.

A flour mill, which is prominent and from whose highest point an obstruction light is shown, stands on the SE point of the peninsula.

A rock, with a depth of less than 1.8m, lies 1.5 miles SW of Pulau Enoe. There are many other outcrops of drying rocks between this island and Tanjong Rancha Rancha.

Outer Shoal (5°15'N., 115°15'E.), a coral patch with a least depth of 0.6m, lies about 1.3 miles E of Hamilton Point and is marked by a lighted buoy.

Harbor Shoal, with a least depth of 2m, coral, lies 1 mile ENE of Tanjong Rancha Rancha.

Trident Shoal (5°14'N., 115°14'E.), with a least depth of 1.2m, lies 2.5 miles E Pulau Burong. Several patches, the shallowest of which has a depth of 3.7m, lie 0.2 mile WSW of Trident Shoal. A rock, with a depth of less than 2m, lies about 0.8 mile W of Trident Shoal. A tangent on the NW side of Pulau Daat, in range about 054° with the SE extremity of Pulau Papan, leads SE of Trident Shoal.

Pulau Labuan—East Side

11.58 Kubong Bluff (Coal Point) (5°23'N., 115°15'E.) lies 0.5 mile SE of Tanjong Kubong. The remains of a pier lie near the bluff and a conspicuous chimney stands 0.5 mile WSW.

Foul rocky ground, some of which dries, extends 2 miles NNE of the bay between Tanjong Kubong and Kubong Bluff.

Tanjong Aru stands 2.5 miles S of Kubong Bluff.

Tanjong Taras (Collier Head) (5°17'N., 115°16'E.), wooded and bordered by cliffs, stands 5.32 miles S of Kubong Bluff. A bank, with depths of less than 5.5m on which there are some rocky ledges which dry, extends up to 1.5 miles offshore between them. Several detached shoals exist near the E edge of the bank.

Drying ledges extend 0.1 mile from Tanjong Taras; some below-water rocks lie up to 0.1 mile further offshore.

A shoal, with a depth of 7.6m, lies 0.3 mile E of Buoy G, which stands about 1.3 miles NE of Tanjong Taras.

East Channel lies between Tanjong Kubong and Tanjong Toulak on the mainland about 8.5 miles ENE. It has a least depth in the fairway of 9.1m.

Tanjong Sakat (5°23'N., 115°22'E.), a thickly wooded point, lies 2 miles SW of Tanjong Toulak. Foul ground extends from 0.3 to 1 mile offshore between them. A shoal, with a depth of 3.2m, lies about 1.3 miles N of Tanjong Sakat. A drying rock lies almost 1 mile NW of this point.

A hill, 133m high to the tops of the trees, stands about 2.3 miles E of Tanjong Sakat.

Pulau Lambidan (Lubidan) (5°23'N., 115°21'E.), covered with trees, the tops of which are 37m high, stands 0.4 mile W of Tanjong Sakat. Both the islet and the point are difficult to make out from the W.

Tanjong Liba (Liba Point) is located 2.5 miles S of Tanjong Sakat. A hill, 113m high, stands 0.5 mile E of the point.

A submarine cable area nearly a mile wide crosses East Channel from about 1.5 miles S of Kubong Bluff, to 1 mile S of Tanjong Sakat. Anchoring within this area is prohibited.

Tanjong Klias (5°18'N., 115°21'E.), marked by a flagstaff, a village, and some trees, stands 3.3 miles SSW of Tanjong Liba.

11.59 Pulau Daat (5°16'N., 115°19'E.) lies on the coastal bank about 1.3 miles SW of Tanjong Klias. That part of the coastal bank extending 4 miles N from Pulau Daat is known as Eastern Bank.

The island is separated from Tanjong Klias by a channel with a least depth of 1.8m. The island is covered over most of its area by coconut trees, but other parts are densely wooded.

The coastal bank continues in a WSW direction for an additional 2 miles. Two rocks, 2m and 4m high, lie 0.3 mile NE of the SW extremity of Pulau Daat. Two other above-water rocks lie 0.5 mile WSW and 1 mile SW of the same point. Other rocks, some of which dry, lie on the bank between Pulau Daat and Pulau Papan.

Pulau Papan (5°15'N., 115°16'E.), located 2.32 miles WSW of Pulau Daat, is flat and wooded. The tallest tree on the E end of the island is 33m high. The lighthouse, a white framework tower near the W end of the island, is not easily made out from the NNE until close to the lighted buoy which stands about 1.3 miles NE of Tanjong Taras. The light is obscured by trees from the ENE and the SW.

Pulau Papan is fringed by a reef which extends up to 0.3 mile offshore. Between this reef and the bank which extends WSW from Pulau Daat, there is a narrow channel with a least depth of 7.6m in the fairway. This channel is recommended only for small local craft.

Tanjong Bendera (Ramsay Point) (5°16'N., 115°15'E.), on the SE side of Pulau Labuan, is located 1.32 miles SW of Tanjong Taras. The coastal bank, with depths of less than 5m and which is marked by some drying reefs, extends 0.3 mile offshore between these points.

11.60 Directions.—The following directions should be used with caution. Pass between Samarang Bank and Vernon Bank. This channel is 4.5 miles wide with depths of more than 18.3m. Fury Rocks, on the S part of Vernon Bank, are usually marked by breakers and these are the only visible means of identifying

this shoal. Pass S of Mackenzie-Grieve Shoals and NE of Four Fathoms Patches.

Medium-draft vessels should pass between Jahat Shoals and Pine Point Shoals, and then W of Iris Shoals.

From a position W of Iris Shoals, steer a S course to pass 2.5 miles E of Kubong Bluff. Then steer through East Channel on course of about 185° to pass 0.4 mile E of the lighted buoy; there are depths of 7m at a distance closer. Then steer for the E extremity of Pulau Papan, bearing 202°, passing 0.35 mile ESE of the beacons standing on 5m contour.

When Outer Shoal Light bears 230°, steer for it on that bearing until Lighted Beacon No. 3 bears 300°, at which time course may be set to enter the harbor between Harbor Shoal and Tanjong Bendera.

Remain on course 230° (see above) with Outer Shoal Light ahead, until Lighted Beacon No. 4 bears 013°, at which time course should be altered to 193° to keep it open of Tanjong Taras astern.

This course leads between Outer Shoal and Pulau Papan into Brunei Bay.

The route passing N of Outer Shoal and then between Enoe Beacon and Outer Shoal may also be followed, but it is less convenient than the former.

Victoria (Labuan Port) (5°17'N., 115°14'E.)

World Port Index No. 51680

11.61 Victoria, a free port, is the only harbor on Pulau Labuan. Victoria is the principal town and a transshipment port for Brunei Bay area, and also functions as an extension port for Kuala Baram.

The harbor, which is sheltered from both monsoons, is entered between Tanjong Ranche Ranche and Tanjong Bendera. Depths in the entrance range from 8 to 11m and decrease gradually toward its head. A vessel with a draft of 9.4m has entered the harbor without difficulty.

A channel had been dredged to 18m between a position 2.5 miles SSW of Pulau Papan to the Iron Ore Jetty.

The entrance to the dredged channel is marked by a safe water lighted buoy. The channel is followed between the lighted buoys into the harbor.

Winds—Weather.—The Northeast Monsoon prevails from December through April. The Southwest Monsoon prevails from the middle of May to the middle of October.

Tides—Currents.—The tidal heights above datum soundings are:

MHHW	2.2m
MLHW	1.6m
MHLW	1.4m
MLLW	0.8m

The tidal currents in Victoria Harbor have a rate of 0.5 to 1 knot; the flood sets NW and the ebb SE.

Depths—Limitations.—Depths in the entrance range from 8 to 11m shoaling gradually to a depth of 6m in the area off the

berths. The S and W parts of the harbor as well as the inner reaches are bordered by shallow depths and drying mudbanks.

Liberty Wharf, 0.3 mile W of Tanjong Bendera, is an L-shaped open pile wharf that is 122m long along its seaward face. There was a depth of 6m alongside the NW end, increasing to more than 7.5m at the SE end; the inner face is 104m long. There was a least depth of 5m alongside.

New Liberty Wharf, close E of Liberty Wharf is 244m long with depths of 8.7 to 9.1m alongside the SW face, 7.1m alongside the inner half, and 8.8m alongside the outer half of the NE face.

Brown and Root Wharf, a T-headed pier extending 0.13 mile from shore, is 0.3 mile W of Tanjong Bendera. The pier head is 45m long, with a depth of 8.5m alongside.

Shell Oil Jetty, close W of Tanjong Bendera, is a T-headed pier that is 52m long across its face and has a depth of 9.4m alongside. Mooring dolphins are placed beyond each end of the face to assist in berthing.

The principal danger for vessels berthing at Shell Wharf is a 1.8m shoal located 0.2 mile SE of Tanjong Bendera.

Several other small piers and wharves are situated NW of Liberty Wharf, with depths of 3 to 5m alongside, but are available only to small local craft.

Sabah Shipyards stand on reclaimed land 0.5 mile WSW of New Liberty Wharf. The shipyard has a wharf 0.18 mile in length with a swept depth of 7.5m alongside.

The Iron Ore Jetty, situated 1 mile SE of the shipyard, extends about 0.16 mile E from the shore and is L-shaped. The outer face is 220m in length with dolphins N and S. There are dredged depths of 18m alongside. The jetty is suitable for ore carriers up to 130,000 dwt.

The Methanol Jetty, situated 0.35 mile SSW of the Iron Ore Jetty, extends 200m ESE from the shore. There are dolphins N and S and dredged depths of 13m alongside.

The Sabah Flour Feed Mill Jetty, situated just S of the methanol jetty, is L-shaped and used for discharging wheat and maize for the Sabah Flour Mill. The 90m jetty face has a mooring dolphin 79m from each end and a charted depth of 10m alongside.

Aspects.—From a position 0.7 mile NE of Trident Shoal, the W shore of the harbor consists of reclaimed land. A village built on stilts stands on a drying bank close N of the reclaimed area opposite the town of Victoria.

Outer Shoal, a 0.6m coral patch marked by a light, lies 1 mile NE of the S extremity of the reclaimed land on the W side of the entrance.

A beacon stands on the NE side of the coastal bank about 0.5 mile NNW of Outer Shoal.

Harbor Shoal Lighted Beacon stands on the N part of the Harbor Shoal, a coral shoal with a least depth of 2m, which lies 0.6 mile NNW of Outer Shoal.

Pilotage.—Pilotage is compulsory for vessels entering and leaving the laid-up anchorage at Brunei Bay. Berthing Masters for the iron ore and methanol jetties are provided by Sabah Gas Industries. Pilotage is not compulsory for vessels entering and using Liberty Wharf but the harbor master undertakes these duties on request. Vessels normally berth between 0600 and 1800 and unberth at any hour by day or night, provided prior notice is given.

Vessels requiring a pilot should notify the harbor master through Kota Kinabalu Radio. The pilot usually boards off Pulau Papan. The pilot launch is equipped with VHF radiotelephones.

Signals.—A signal station is situated on the roof of the Marine Office, near the inner end of Liberty Wharf about 0.7 mile WNW of Tanjong Bendera.

Tidal and berthing signals are displayed from a flagstaff at the signal station as follows:

Signal	Meaning
Cone, point up	Ebb current
Cone, point down	Flood current
Ball	Slack water

Berths to which vessels are assigned are indicated by two hoists; the vessels signal letters and by a red and white checkered flag superior to the International Code pennant.

Pennant No.	Berth
0	Anchor
1	Esso Wharf
2	Landing Craft Wharf
3	Victoria Wharf
4	Liberty Wharf (Inside Face)
5	Liberty Wharf (Seaward Face)
6	New Liberty Wharf (Inside Face)
7	New Liberty Wharf (Seaward Face)
8	Brown and Root Wharf
9	Shell Wharf

1. A vessel should acknowledge the berthing signal with the Answering Pennant. The hoist at "half mast" indicates that the vessel should prepare to move, but she should not get under way until the hoist is "close up."

2. Red and white checked flags are displayed on the wharf to indicate the position of bow and/or stern of vessel on the berth allocated.

3. International Code Flag "B" is displayed on the opposite yardarm to the berthing signal when a vessel loaded with inflammable or dangerous cargo is berthing or unberthing.

Anchorage.—Vessels should anchor if the harbor is congested, in suitable depths, clear of the fairway to the inner part of the harbor with open hawse to the SW.

A prohibited anchorage area exists within 0.33 mile of the SE head of New Liberty Wharf.

The positions of the explosive, quarantine, and petroleum anchorages can best be seen on the area chart.

Directions.—When approaching from the W and having passed S of Barat Banks, steer 045° for Pulau Papan until Harbor Shoal Lighted Beacon is in range 007° with the center of the Shell Wharf. Then maintain these marks in range until the beacon lying 0.5 mile WNW of Outer Shoal bears 277°, at which time course may be set as necessary for the anchorage or the allocated berth.

If preferred, a vessel may steer for Pulau Papan Light until Outer Shoal Light and Harbor Shoal Lighted Beacon are in range, bearing 342°. Then steer 013° with Lighted Beacon No. 3 just open of the right tangent of Tanjong Taras, passing midway between Outer Shoal and Pulau Papan, and then into the harbor.

It was reported that Outer Shoal Light and Harbor Shoal Light were difficult to distinguish because of the glare of car headlights.

Caution.—Foul ground with numerous submerged objects, indicated on the chart, lies in an area between a position 0.5 mile W of Harbor Shoal and the coastal bank. Caution should be observed when anchoring in this area.

Brunei Bay—West Side

11.62 Bukit Selila (4°55'N., 114°58'E.), a sharp peak 195m high with a solitary tree, stands 10 miles SW of Brunei Bluff. The hill is the summit of a ridge which extends NE and SW.

Jaja Ridge (4°56'N., 115°00'E.), steep and heavily wooded except for occasional clearings, lies close E of and parallel with the ridge extending from Bukit Selila. Jajak Ridge, which attains an elevation of 164m, terminates 3.3 miles SW of Brunei Bluff.

Bukit Buang Sakar (4°51'N., 114°57'E.), a sharp peak 234m high, and Bukit Say, 218m high and rounded, are two prominent wooded hills standing 3.3 miles SSW of Bukit Selila.

Bukit Tempayang Pisang (5°01'N., 115°03'E.), 165m high with a small beacon on its summit, which is prominent when seen from Muara Outer Bar, stands about 2.3 miles SSW of Brunei Bluff.

Tanjong Pelompong (5°02'N., 115°07'E.), the NW entrance point of the Sungai Brunei, lies on the S side of the entrance of Brunei Bay, 4 miles E of Brunei Bluff. This sandy point is covered with driftwood and is almost awash at HWS. The point extends E at a rate of 30m a year.

Caution.—Dead trees and logs may be encountered for a considerable distance from this coast. After heavy rains in the interior, miniature islands of trees and earth float down the rivers and eventually find their way out to sea.

A compact grove of trees, 18 to 37m high, extends W from Tanjong Pelompong for about 1.3 miles; farther W, the low coast is covered by trees 18m high.

Muara Spit, composed of sand, extends about 3.3 miles ENE from Tanjong Pelompong. The spit is awash for about 1.3 miles E from the point, but from there the depths increase to 4.3m at its outer end which is usually marked by tide rips.

Tanjong Trusan (4°58'N., 115°11'E.), the SE entrance point of the Sungai Brunei, is low and tree-covered. This point, which lies 6.5 miles SE of Tanjong Pelompong is the NW extremity of a promontory of the mainland.

Tanjong Gosok lies 0.5 mile E of Tanjong Trusan and Tanjong Perepat (Tanjong Sundar) lies 1.5 miles E of the same point. Pulau Sunda lies close W of this latter point.

11.63 Sunda Spit (4°59'N., 115°11'E.), which dries, extends 2.5 miles NW from Tanjong Trusan. Sunda Bank, with depths of less than 5.5m, extends 5.5 miles NNE from Sunda Spit.

Batang Trusan, a shallow river available only to small boats, is entered close SW of Tanjong Trusan.

Pulau Alang (4°57'N., 115°11'E.), a small islet 24m high, lies 0.3 mile SSW of Tanjong Trusan.

Sungai Brunei is entered from NE between Maura Spit and Sunda Bank, crossing Muara Outer Bar through a channel about 2.5 miles wide.

A patch with a least charted depth of 4.9m lay in the middle of the outer bar, about 3.3 miles E of Tanjong Pelompong. By passing E and then S of the 4.9m patch, a vessel should be able to carry a depth of 6.7m across the bar over a width of about 0.3 mile.

Within the outer bar depths increase to over 14m off Ujong Sapoh, where the channel is about 1.3 miles wide.

The passage across the bar is considered to be safe for vessels with a draft of 6.1m in clear weather at 0.3 flood. Deeper draft vessels should not attempt to enter unless the shoals have been previously buoyed.

Pulau Muara Besar (5°00'N., 115°07'E.), which shelters Muara Harbor from the E, lies 2 miles S of Tanjong Pelompong, from which it is separated by Anson Passage. The flat, marshy island is wooded in places with the tops of the trees up to 30m high.

Ujong Sapoh (5°00'N., 115°08'E.), the E end of Pulau Muara Besar, lies 3 miles S of Tanjong Pelompong. Ujong Sapoh Light is shown from a silver metal framework tower situated on the point.

Tanjong Kramati (Tanjong Keramat) lies 1 mile NNW of Ujong Sapoh. The intervening coast is bordered by a bank, with depths of less than 1.8m, which extends 3.32 miles NE from Pulau Muara Besar. The inner part of the bank dries.

Ledong Point (5°01'N., 115°04'E.), the NW extremity of the island, lies 2.32 miles WNW of Tanjong Kramati. The coast in between is fringed by mangroves.

Tanjong Bowong lies 2.5 miles W of Ujong Sapoh. The coast in between is fringed by a mud and sand bank. A drying bank extends 183m offshore from Tanjong Bowong. Passage S of the island is obstructed by Muara Bar.

Muara Harbor (5°02'N., 115°04'E.)

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11.64 Muara Harbor lies between Pulau Muara Besar and the mainland to the W. The port facilities are situated at Brooketon on the NW side of the harbor. The harbor has depths of 5.5 to 15m, mud, and is completely sheltered.

The port facilities were able to accommodate all coastal and ocean-going shipping operations formerly carried out by the port of Bandar Seri Begawan (Brunei Harbor). Modern alongside berthing facilities are provided for all dry cargo vessels capable of entering the harbor.

Works were in progress on construction of a deep-water jetty to accommodate ocean-going tankers within the harbor area.

Muara Harbor can be approached as follows: From the NE through the deep-water channel, cut through Muara Spit which is the principal entrance; from the E through Anson Passage between Muara Spit and Pulau Muara Besar; from the SE by passing S of Pulau Muara Besar and crossing Muara Bar.

Tides—Currents.—The tidal currents set strongly across the entrance of the deep-water channel. Within the shelter of the W breakwater, both the ebb and the flood set in the direction of the channel. At springs a rate of 2 knots has been observed when the ebb is running. The flood seldom exceeds 1 knot.

It is advisable to enter and leave Muara Harbor at slack water because of the strong currents; the strongest currents occur from 2 hours before HW until HW, and from LW until 1 hour after LW.

After heavy rains numerous logs and floating islands drift downstream into the harbor and sometimes cause heavy damage to small craft.

Tidal heights above datum soundings are, as follows:

MHHW	2.0m
MLHW	1.5m
MLLW	0.7m
MHLW	1.4m

Depths—Limitations.—The entrance of the dredged channel leading into Muara Harbor lies about 2.3 miles ENE of **Brunei Bluff** (5°03'N., 115°03'E.). A radio tower, about 24m high, stands 0.3 mile SSW of Brunei Bluff.

The dredged channel has a bottom width of 150m and was dredged to a least depth of 9.1m. The channel is protected on each side by a training wall. The W training wall is about 1.1 miles in length. The outer portion is below-water at all times, with only the inner 0.5 mile being above-water at LWS and the inner 167m being above-water at HWS. The E training wall is 0.24 mile long. The entire wall is above-water at LWS and the inner 0.12 mile is above-water at HWS.

Lighted beacons in range, bearing about 209°, lead through this channel and into the harbor.

Lighted beacons and buoys mark the sides of the channel and the deep-water area within the harbor.

The tidal currents set strongly across the seaward entrance of the deep-water channel.

Anson Passage is suitable only for small vessels with local knowledge. The least charted depth is 2.1m.

Muara Bar lies between the S side of Pulau Muara Besar and the N end of Rambler Banks, 0.3 mile to the S. Vessels up to 5m draft can use this approach.

Muara Bar, lying 0.2 mile S of Tanjong Bowong, had a depth of 3.4m, soft mud. A vessel crossed the bar four times at HW and did not sound a depth of less than 3.4m reduced to chart datum.

The sides of the channel leading across Muara Bar are marked by beacons, some of which are lighted.

Muara Port Wharf is about 0.2 mile long with a depth of 9m alongside. It is divided into five equal sections numbered from 1 to 5 from the SW end. There are three berths; a container



Muara Harbor

berth 152m in length but no container crane exists; a general cargo berth 183m in length; and a sand and gravel berth 93m in length.

Muara Jetty, situated near the SW corner of Muara Port Wharf, has a pontoon at its head for berthing fishing boats and small craft. The area 0.5 mile SSW of this jetty was being reclaimed.

A ramp for landing craft exists in the bight between the above jetty and wharf.

A T-shaped jetty extends 180m SE from a position 250m NE of the NE spur of Muara Port Wharf. There are depths of 8.5m alongside. A dolphin stands midway between this jetty and the Shell Jetty.

Shell Jetty lies 0.3 mile NE of the NE spur of Muara Port Wharf. The jetty extends 150m SE from the shore and has two breasting dolphins at its head. It is planned to dredge the head to a depth of 9m. The berthing face is 67m long. A tank farm stands at the root of this jetty.

Ocean Inchcape Supply Base Jetty is situated 183m NE of Shell Jetty. There are depths of 6.1m alongside the face of this jetty. A radio mast, marked by red obstruction lights, lies about 0.12 mile NNW of this jetty.

The Naval Base Jetty is situated about 0.3 mile NE of the NE spur of Muara Port Wharf. The jetty has two faces which form an angle of about 165°. The E face is connected to the shore by reclaimed land and is 90m in length. The W face lies on the outer side of an arm extending about 0.11 mile WSW. There are depths of 4 to 5.5m alongside.

A small L-shaped jetty and ramp lie about 87m W of the WSW end of the Naval Base Jetty.

Pilotage.—Pilotage is compulsory for merchant vessels over 30m in length using the deep-water entrance channel. Pilots are boarded 0.5 mile N of Lighted Beacon No. 1 West.

Requests for pilots should be made to the Director of Marine, Serasa Muara, Brunei Darussalam at least 24 hours in advance.

Regulations.—Entry into the Deep Water Channel (NE approach) is controlled to prevent vessels from entering the channel from opposite directions at the same time. This control is exercised by signals from the port signal station and mast situated on Maura Spit near the root of the W training wall.

Anchorage.—The deep water quarantine anchorage within Muara harbor is situated between about 0.2 mile and 0.75 mile SSW of the SW end of Muara Port Wharf. Two anchors should be used because of the restricted swinging room.

Tanjong Sapu Quarantine Anchorage lies almost 1 mile S of Tanjong Sapu Light, in a depth of 10.7m. This is also the quarantine anchorage for vessels proceeding to Tanjong Salirong Anchorage.

Directions.—When entering Brunei Bay from the W, pass either between Abana Rock and Barat Banks, or between Abana Rock and Pelong Rocks.

When the pilot is boarded, proceed to a position about 140m E of Lighted Beacon No. 1 West on a heading of 210°. Then proceed through the dredged channel, keeping strictly to the range lights in line, bearing about 209°. Mariners are cautioned that passage through this channel is strictly controlled during dredging operations. The course should be altered to 246° when Buoy No. 7W is abeam, for Muara Port Wharf or the anchorage.

If entering the Sungai Brunei E of Muara Spit, make for a position of 9 miles E of Pelong Rocks, when the NE extremity of Pulau Rusukan Besar is in line with the W extremity of Pulau Kuraman, bearing 332°. From this position, steer 175° for 1 mile with Pulau Burong nearly astern. Pulau Rusukan Besar should be kept bearing less than 337°.



Muara Harbor

When Tanjong Trusan Lighthouse bears 189° , steer for it on that bearing, which leads about 0.5 mile E of the shallowest part of the outer bar. When Tanjong Sapu Light bears 243° , steer for it on that bearing until it is distant about 1.5 miles, at which time course should be altered for Tanjong Sapu Quarantine Anchorage or for the SE entrance of Muara Harbor.

The sand knolls on the Outer Bar, on the W side, and Sunda Bank on the E side, may also be avoided by keeping the angle between Bukit Tempayang Pisang and the summit of Pelong Rocks between 24.5° and 25° until Tanjong Sapu Light bears 243° .

Muara Bar should be approached with Muara Bar Lighted Beacon No. 27 bearing 277° . When about 0.3 mile from this light-structure, Bukit Tempayang Bisang should be steered for bearing 294° . Pass N of Muara Bar Lighted Beacon No. 27 and alter course slowly to starboard to 300° , with Muara Bar Lighted Beacon No. 26 bearing 120° astern. When Muara Jetty, near the SW corner of Muara Port Wharf bears 356° , steer 345° for the wharf or deep-water anchorage.

Sungai Brunei and Approaches

11.65 Pulau Badu Kang ($4^\circ59'N.$, $115^\circ04'E.$), 32m high to the tops of the trees, densely wooded, and surrounded by

swamps, lies on the W side of the estuary 4 miles WSW of Tanjong Sapu. This island lies in the SE approach to a bay, almost all of which dries. Only small boats can navigate within this section of the bay. A causeway has been constructed W of Muara Bar and 1 mile NE of Pulau Badu Kang.

Oyster Rocks, 1m high, lie on the coastal bank 0.5 mile SW of Pulau Badu Kang.

Brunei Channel ($4^\circ59'N.$, $115^\circ05'E.$) is entered close SE of Muara Bar and then leads SW for 4 miles to abeam of Kaingarin. This section ranges from 0.1 to 0.2 mile wide and has a least depth of 5.5m. Vessels drawing 5.5m can proceed as far as this spit, but except in an emergency, it is recommended that vessels drawing more than 4.6m should not proceed beyond the anchorage off Ujong Sapoh.

Two beacons in range, bearing about 51.5° astern, lead through the NE part of Brunei Channel. The beacons stand in a clearing, but because of the surrounding trees are visible only over a limited arc.

Rambler Banks ($4^\circ58'N.$, $115^\circ06'E.$), which mostly dry and which stand on the E side of the channel, extend 7 miles NE from Tanjong Semastra.

Tanjong Kindana (Tanjong Semastra) ($4^\circ55'N.$, $115^\circ01'E.$), the N extremity of Pulau Berambang and the E entry point of the Sungai Brunei, lies 4 miles SSW of Pulau Badu Kang. It may be identified by Bukit Kindana, 157m high to the top of a

conspicuous clump of trees, standing 0.8 mile SSW of the point. The hill is densely wooded.

Pulau Kingaran (4°57'N., 115°01'E.), densely wooded and 37m high to the tops of the trees, lies 2.5 miles SW of Pulau Badu Kang. A narrow, deep channel separates the island from the mainland.

Kaingarin (4°57'N., 115°02'E.), which dries, extends almost 1 mile ENE from the N end of the island. Some prominent rocks lie close off the S end of the island.

11.66 Pulau Chermin (Pulau Churmin) (4°56'N., 115°01'E.), 33m high to the tops of the trees, lies 0.6 mile S of Pulau Kingaran. The island is densely wooded.

Brunei Inner Bar extends from Kaingarin to Pulau Chermin and forms the principal obstruction in the approach to the Port of Bandar Seri Begawan. The principal shoals which make up this bar are:

North Bar Bank, with a depth of 0.6m, lies 0.5 mile E of Pulau Kingaran; South Bar Bank, with a depth of 0.3m, 183m farther E; Barrier Bar, which almost crosses the channel close SW of the two banks, has a depth of 0.3m. There was a clear boat passage leading W from the vicinity of South Bar Bank Lighted Beacon No. 30 over the central part with depths of 1.8m. A 1.2m patch lies on the S side of the passage 183m W of South Bar Bank Lighted Beacon No. 30. Simpson Channel, which leads over Brunei Inner Bar, lies between North Bar and South Bar Banks, has a least depth of 2.1m and a width of 183m in the fairway.

Chermin Rock (4°56'N., 115°01'E.), lies 183m NW of the N end of Pulau Chermin. A beacon marks this danger.

Vessels not intending to cross Brunei Inner Bar can anchor, in a depth of 6m, about 1 mile E of the N end of Pulau Kingaran, with Pulau Chermin Light bearing 227°.

Anchorage.—The quarantine anchorage lies about 0.3 mile S of Lighted Beacon No. 40. This anchorage should be used by a vessel waiting to anchor off the town or waiting to go alongside Bandar Seri Begawan Wharf.

Good anchorage has been reported, in a depth of 13m, off the entrance of the Sungai Meragang, at the W end of the town with sufficient room for a vessel, 52m in length to swing.

A vessel has anchored in a depth of 11m in the fairway about 183m E of Bandar Seri Begawan Wharf.

11.67 Bandar Seri Begawan (Brunei) (4°53'N., 114°56'E.) (World Port Index No. 51630), the capital of the State of Brunei, stands at a bend in the river about 9 miles above its entrance. The old town is built on mud flats in the river, the houses standing on piles in 0.9 to 1.2m of water. The new town, which contains the government buildings, stands on the N bank of the river. The British High Commissioner and the Sultan of the State of Brunei reside in the town.

Tides—Currents.—Tidal currents in Brunei Channel abeam of Muara Bar sometimes set across the fairway; in the remainder of this channel they set up and down the fairway.

In Simpson Channel, the flood has a rate of 2 knots and the ebb a rate of about 3 knots.

Depths—Limitations.—The Sungai Brunei, between Chermin Rock and Lighted Beacon No. 35, about 4 miles SW has a depth of 5.5m and the fairway favors the W bank. In the vicinity of this lighted beacon, the channel trends to the SE and

then SW to the W bank again in the vicinity of Lighted Beacon No. 36. About 1 mile SW of this latter beacon, the channel gradually turns at Lighted Beacon No. 37 to pass E and then S of **Pulau Sibungor** (4°52'N., 114°57'E.). The channel then turns N and leads into the port area fronting the town of Bandar Seri Begawan. The channel W of Pulau Sibungor becomes narrow and shoals to depths of 3.7m close to Lighted Beacon No. 39. Farther N, the fairway deepens again to depths of 5.5m, and to depths of 9.1m and more off the town.

Bandar Seri Begawan Wharf, of modern concrete construction, is 222m in length with depths of 4.9 to 5.8m alongside; the passenger pier is 38m long. Six lighters are available, but about 1 week notice is required for their use.

An oil wharf, 9m in length with two mooring dolphins and depths of 1.8 to 5.8m alongside, lies 0.5 mile downstream.

Pilotage.—Pilots for the Sungai Brunei are available on application to the Marine Office, Bandar Seri Bagawan.

Regulations.—Only the following vessels are permitted to proceed to the port of Bandar Seri Beagawan:

1. Small wooden coasters, operating within Brunei Bay, not exceeding 24m in length and 50 grt.
2. Vessels proceeding to the Shell Oil Depot at Kampong Subok.
3. Tugs and lighters carrying stone aggregates.
4. Passenger ferries operating between ports in Brunei Bay.
5. Ships under tow are not permitted to navigate Sungai Brunei.

Signals.—Berthing signals are displayed from the Customs Station Check flagstaff at the head of the pier, 0.3 mile N of Pulau Sibungor, as follows:

Day signal	One black ball
Night signal	One red light

A vessel may proceed alongside Bundar Seri Begawan Wharf when the signals are hauled down.

A red over white horizontally halved pennant is displayed at the upstream end of the wharf as an indication of the direction to lay the ship's head in order to come alongside against the current.

Anchorage.—The quarantine anchorage lies about 0.3 mile S of Lighted Beacon No. 40. This anchorage should be used by a vessel waiting to anchor off the town or waiting to go alongside Bandar Seri Begawan Wharf.

Good anchorage has been reported, in a depth of 13m, off the entrance of the Sungai Meragang at the W end of the town, with sufficient room for a vessel, 52m in length to swing.

A vessel has anchored, in a depth of 11m, in the fairway about 183m E of Bandar Seri Begawan Wharf.

Caution.—Local knowledge is essential to make passage from Brunei Inner Bar WSW through Simpson Channel and through Sungai Brunei.

No vessel should enter the channel S of Simpson Channel if there is any likelihood of having to pass another vessel.

11.68 The approach to the Sungai Limbang, S of Ujong Sapoh, is by a straight channel about 5.3 miles in length to a

position about 1.3 miles NNW of **Tanjong Lumba Lumba** (4°53'N., 115°06'E.).

This channel, separated from Brunei Channel by Rambler Banks, has a depth in the fairway of 9.4m over a width of 183m, and of more than 7.3m over a width of 0.5 mile.

Pulau Pepatan (4°55'N., 115°03'E.) and Pulau Baru Baru lie on the inner part of Rambler Banks, 1.5 miles E of Bukit Kindana. Pulau Pepatan, the N islet, is flat and densely wooded. Pulau Baru Baru is also flat and wooded, except on the S side, where a bare hill rises to a height of 33m.

Pulau Berbunot, 0.4 mile SE of Pulau Baru Baru, has two summits joined by low land. The NE summit is wooded and the SE summit is scrub covered and has two conspicuous trees.

Pulau Lelipan and Pulau Selamok, two small islets, lie SE of Pulau Berbunot.

Sungai Temburong Entrance (4°49'N., 115°03'E.) lies 5 miles SSW of Tanjong Lumba Lumba. The E shore of the estuary in this vicinity is composed of mangrove swamps, intersected by numerous unimportant rivers which are difficult to identify from offshore.

Pulau Kitang (4°53'N., 115°06'E.), covered with mangroves, lies 0.6 mile S of Tanjong Lumba Lumba.

The mouths of the Sungai Limbang and the Sungai Pandaruan lie on the W side of the estuary between Pulau Berbunot and the Sungai Temburong. Sungai Limbang is entered close N of **Tanjong Tobu-Tobu** (4°51'N., 115°01'E.) which lies 1.33 miles SSW of the S extremity of Pulau Berbunot. The river can be navigated by vessels of 3m draft as far as Limbang, 8 miles above its entrance.

A narrow channel, 0.4 mile wide between the 2m contours, leads from a position 0.5 mile NW of Tanjong Lumba Lumba to a bar 3.5 miles SW; this channel also leads to the entrance of the Sungai Temburong and the Sungai Pandaruan.

A lighted buoy is moored about 1.3 miles E of Tanjong Tobu-Tobu and marks the starboard side of the entrance of the Sungai Limbang. This buoy is shifted as the channel changes.

The channel across the bar had a depth of 0.6m. Beacons mark the channel sides.

Within the bar, there are depths of 2 to 27m in the Sungai Limbang as far as Limbang, where the channel is obstructed by some sunken rocks, over which there are strong eddies. Above these rocks there are depths of 3.7 to 7.3m. There are very strong eddies at the sharp river bend, just below Limbang.

Anchorage.—Anchorage for ocean-going vessels can be taken, in depths of 8m, about 1.3 miles NNW of Tanjong Lumba Lumba and 5 miles NE of the bar.

Vessels loading logs at Tanjong Lumba Lumba anchor 0.3 mile SW of the point.

The quarantine anchorage lies 0.9 mile S of Ujong Sapoh.

Directions.—From Ujong Sapoh, steer SSW through the approach channel, whose limits are usually marked by large fish traps, to a position 0.5 mile NW of Tanjong Lumba Lumba. No vessel should proceed beyond this point without local knowledge. Enquiries regarding pilots for the Sungai Limbang should be made to the Director of Marine, Kuching.

The river brings down quantities of lumber and a good lookout must be kept for stranded trees.

11.69 Limbang (4°45'N., 115°00'E.), a small river port of some commercial importance, stands on the E bank of the

Sungai Limbang, about 7 miles above the entrance. Vessels up to 55m in length and of 970 grt have berthed at Limbang.

The principal wharves are as follows: Customs Wharf, 24m long, with depths of 2.3 to 4.1m alongside; JKR Concrete Wharf, 16m long, with depths of 5.5 to 6.3m alongside; JKR Belian Wharf, 7m long, with depths of 1.8 to 3m alongside; JKR Wharf, 19m long, with depths of 2 to 2.8m alongside; Resident's Wharf, 7m long, with depths of 1.7 to 2m alongside.

Sungai Pandaruan (4°49'N., 115°02'E.) is entered 0.4 mile W of the N end of Pulau Siarau, 2.3 miles SSE of Tanjong Tubu-Tubu.

Kampong Rangau, from which a boat channel leads W into the Sungai Limbang, lies on the W side of the entrance. A depth of about 0.3m can be carried through this channel.

From abeam Tanjong Tobu-Tobu to the S end of Pulau Siarau, a depth of 2.7m can be carried in the Sungai Pandaruan. From here a depth of about 2m can be carried up the Sungai Pandaruan to a position abeam of Bukit Terumi, which is connected by road with Limbang. Sungai Pandaruan, which runs for 30 miles S from its entrance, is navigable by small craft with a draft of 1.2m for 9 miles above its entrance.

Sungai Temburong is entered 0.8 mile E of the N end of Pulau Siarau. There is a depth of 2.7m in the approach from abeam of Tanjong Tobu-Tobu as far as the entrance.

Above this position there are depths of 1.8 to 9.1m for a distance of 7 miles. The river is navigable by small craft, with a draft of 1.2m as far as Bangar, 8 miles above the entrance.

Brunei Bay—East Side

11.70 Between **Tanjong Lumba Lumba** (4°53'N., 115°06'E.) and **Tanjong Perepat** (Tanjong Sunda) (4°58'N., 115°12'E.), the coast is composed of mangrove swamps and backed by tall trees. The coast is intersected by numerous rivers and is entirely devoid of landmarks.

Between Tanjong Sunda and Tanjong Mengalong, 15 miles ENE, the area has not been fully surveyed.

Caution.—Floating logs and other debris, brought down by the rivers, may be encountered in the bay especially after heavy rains.

Bukit Sari (4°56'N., 115°23'E.), a small peninsula, 140m high and conspicuous, lies 10 miles E of Tanjong Perepat.

Several small rivers flow into the bay which lies in between. The peninsula is sometimes difficult to make out because of the higher land behind it.

Bukit Selingai, 740m high, is located 10 miles SSW of Bukit Sari. Bukit Batanga, 1,777m high, stands 16 miles ESE of Bukit Sari, a high range of mountains extends 10 miles NNE and W, and 21 miles SW from this peak.

Batang Lawas (4°58'N., 115°25'E.), entered 2 miles NE of Bukit Sari, is available only to small craft.

Open anchorage can be taken by ocean vessels when loading timber about 1.5 miles E of the river entrance in depths of 18m.

A lighted buoy lies at the outer end of the channel leading across the flats to Batang Lawas. The buoy is moved as necessary to conform to changes in the channel.

Vessels should pass NE of this buoy.

There was a depth of 0.5m over the bar at the entrance of the river. The channel is marked by stakes which are moved as necessary to conform with changes in the channel.

There is a customs wharf at Kuala Lawas village on the SW bank of the river 1 mile within the entrance.

Lawas, the principal town, is situated 11 miles above the river entrance. The Customs Wharf at Lawas is 20m long, with depths of 0.3 to 1.2m alongside.

11.71 Tanjong Mangalong (5°01'N., 115°28'E.) stands 6 miles NE of Bukit Sari.

Sungai Mangalong, which is navigable only by small boats, discharges close S of this point. A village stands on the right bank of the river, 0.5 mile within the entrance.

Bukit Suai (4°58'N., 115°28'E.), 166m high and conspicuous, stands 2.33 miles S of Tanjong Mangalong.

Tanjong Marintaman (5°04'N., 115°32'E.) lies 5.5 miles NE of Tanjong Mangalong. A bay and a few rocky promontories lie in between the two points.

A jetty 120m long, 30m wide, approached via a bridge 300m long, extends WNW across the 11m depth contour 1,183m WSW of Tanjong Sebuoh. It serves a pulp and paper mill and can accommodate vessels up to 15,000 dwt.

A rubble jetty extends NW to the 5.5m depth contour from a position 0.2 mile SSW of Tanjong Sebuoh.

A rock, 5m high, lies close W of Tanjong Sebuoh and a reef, which dries 2.7m, lies close N of the same point.

Off-lying Dangers

11.72 Takat Besar (5°04'N., 115°30'E.), a group of rocks with a least depth of 0.9m, lies 1.33 miles WSW of Tanjong Marintaman. Several other rocks lie between Takat Besar and the shore. The least depth on these is 2.4m.

Takat Kahar, with a depth of 10.3m, lies 1.33 miles WSW of Tanjong Marintaman.

Passage between these rocks and the coast is possible, but because the dangers are unmarked, it should not be attempted.

Takat Ludin (5°04'N., 115°31'E.), a 5.1m rocky patch, and Takat Daim, a rock with a depth of 2.4m, lie about 1 mile E and ESE of Takat Besar.

Takal Mengal (5°05'N., 115°32'E.), a rocky ledge with a depth of 2.7m, lies between 0.2 mile and 0.35 mile N of Tanjong Marintaman.

Two unimportant rivers discharge at the head of Telok Batu Bedara, about 0.4 mile SE of Tanjong Marintaman.

A peak, 256m high, 3.3 miles SSE of Tanjong Marintaman, is the highest point of a range of hills which extend W from Croker Range, running about 18 miles parallel to the coast.

A village stands at the mouth of the Sungai Sipitang, a small river available only to small boats, about 1.3 miles NE of Tanjong Marintaman. A bridge spans the river a short distance above the entrance.

Good anchorage can be taken in a depth of 11m, mud, 0.3 mile offshore. The river should be approached with the entrance bearing 110° and anchor when Tanjong Marintaman bears 200°.

The coast between the mouth of Sungai Sipitang and the S entrance point of Padas Bay, 3.5 miles N, is low and fringed with trees. The drying coastal bank extends from 0.2 to 0.5 mile offshore and depths of less than 5.5m extend from 0.4 mile offshore in the S part to 1.3 miles offshore in the N part.

It was reported that this coastal bank was extending S and W and that patches, with depths of 0.4 and 4.5m, lay 1.3 miles WNW and 1.3 miles SW, respectively, of the mouth of Sungai Lukutan.

Padas Bay (5°10'N., 115°32'E.), fouled by sand and mud flats which dry, lies in the NE part of Brunei Bay.

Sungai Lukutan enters the bay close to the S entrance point of Padas Bay.

A peak, 329m high, rises 4 miles E of the S entrance point of Padas Bay; a 181m high hill stands 1 mile NNW.

11.73 Tanjong Batu Batu (5°11'N., 115°34'E.) lies 6.5 miles N of the mouth of the Sungai Sipitang. The Sungai Padas channel, which runs close NW of Tanjong Batu Batu to Weston, was reported to have a depth of 1.8m at the entrance and 1.5m on the bar near Weston. The bar at the entrance of the Sungai Padas was reported to have extended 0.5 mile seaward.

The channel within the river is marked by beacons and a black conical buoy marks the entrance. The beacons are often destroyed by log rafts.

Weston (5°13'N., 115°36'E.), a small town and river port, lies on the SE side of Padas Bay 2.5 miles NE of Tanjong Batu Batu. A small jetty, 12m long, extends from the shore abreast of the town.

The Sungai Padas, about 100 miles long, lies on the N side of Padas Bay, but is available only to small craft.

Tanjong Klias (5°18'N., 115°21'E.) is located 15 miles NW of Padas Bay. The trees in the vicinity of the point are 27m high, whereas the land to the SE is low and flat.

A large anchorage for laid-up vessels extends from S of Pulau Papan to Padas Bay. Anchoring is prohibited within 0.27 mile of the submarine pipeline passing about 4.3 miles S of Tanjong Klias.

A detached 11m sandy patch lies 4.5 miles S of Tanjong Klias and clear of the coastal bank, which lies 4.3 miles SSE of the point.

Sungai Klias (5°17'N., 115°22'E.) is entered 1.3 miles E of Tanjong Klias. A flat, which dries 0.9m, obstructs the entrance and divides the channel into two arms. Three small tree-covered islets lie on the flat.

The main approach channel lies close S of Tanjong Klias and can be reached by passing through the channel close E of Pulau Daat, which stands 1.3 miles SW of Tanjong Klias.

There is a depth of 1.8m over the bar and the same depth can be carried for several miles within the entrance.

In the S approach channel, E of Pulau Sarangtiong, there is a depth of 0.3m. Two beacons mark this channel NE of Pulau Sarangtiong.

A village stands on the S side of Tanjong Klias and a village stands within the river entrance about 1.3 miles to the ENE. Two jetties and a flagstaff are situated in the village S of Tanjong Klias.

Tanjong Toulak to Tanjong Nosong

11.74 From **Tanjong Toulak** (5°25'N., 115°23'E.), lying 8.5 miles ENE of Tanjong Kubong (Bethune Head), the W entrance to Brunei Bay, the coast extends regularly NE for about 18 miles to Tanjong Nosong without any pronounced indentation or projection. From a position about 3.5 miles NE

of Tanjung Toulak to Pine Point, about 6.5 miles farther in the same direction, the coast rises to a range of hills, the highest elevation being a conspicuous 162m peak near the SW end of the range. Bukit (Nosong) Bantayan, 110m high, stands 1.5 miles S of Tanjung Nosong. A densely wooded range extends 2.3 miles SW from this hill.

The coastal bank, with depths of less than 11m, extends from 0.3 to 2 miles offshore between Tanjung Toulak and Tanjung Nosong. Many detached shoals, with depths from 1.8 to 5.5m, exist on this bank. Several spits, with depths of less than 5.5m, extend as far as the 11m curve.

A rock, with a depth of less than 1.8m, lies on a spit 3.3 miles NE of Tanjung Toulak. Sunken and drying rocks, one of which dries 1.5m, extend up to 0.4 mile offshore between 1.3 miles SW and 1 mile NE of Pine Point.

A spit, with depths of less than 5.5m, extends 1.5 miles N from Tanjung Nosong. Many above and below-water rocks exist on this spit.

Tangut Rock, 9m high, and Cake Rock, 7m high lie, respectively, 10.2 mile N and 0.2 mile NNE of Tanjung Nosong. A 4.6m patch lies 2 miles NNE of this point.

There are depths of less than 11m up to 3 miles NNE of Tanjung Nosong.

Caution.—The sea off this coast is usually very discolored and the shoals, even with good light, are difficult to make out.

11.75 Iris Shoals (5°30'N., 115°23'E.) consist of several shoal patches, with a least depth of 3.7m, lying 3.5 to 6 miles N of Tanjung Toulak. The two N patches each have a depth of 5.5m.

Several shoals, with depths of 2.7 to 8.7m, lie between Iris Shoals and Tanjung Toulak. The S shoal lies 1.5 miles N of the point and is the shallowest.

Pine Point Shoals (5°31'N., 115°27'E.), with depths of less than 5.5m, extend 4.5 miles NW from a position 3 miles SW of Pine Point. A coral patch, with a depth of 0.3m, lies 4.5 miles WNW of Pine Point.

Nosong Patch (5°39'N., 115°33'E.), with a depth of 6.4m, lies 2.3 miles WNW of Tanjung Nosong. Several patches, with depths of 5.5 to 6.4m, lie between Nosong Patch and the coastal bank to the SE.

Haselfoot Patches (5°28'N., 114°57'E.), consisting of two coral shoals each with a depth of 7.3m, lie 0.5 mile apart 19 miles WNW of **Tanjung Kubong** (5°24'N., 115°15'E.).

Samarang Bank (5°35'N., 114°55'E.), consisting of dead coral and sandy patches, has general depths of less than 11m, and a least depth of 6.4m. It lies between 21 and 26 miles WNW of Tanjung Kubong. An obstruction with a depth of 2.4m, was reported on the SW extremity of Samarang Bank; its position is approximate.

Caution.—Less water than charted has been reported (1997) on and in the vicinity of Samarang Bank.

11.76 Samarang Oil Field (5°37'N., 114°53'E.) is situated in the area of Samarang Bank. Within the oil field there are many production platforms, wellheads, and other structures. Submarine oil and gas pipelines are laid from a wellhead standing on the NW side of the bank to the oil terminal near Tanjung Punei.

Fish Attracting Devices contained in steel boxes, may be encountered moored within an area triangular in shape. The base of the area lies between the ammunition dumping ground 5°30'N, 114°10'E, and Louisa Reef 70 miles NW, the apex at 7°10'N, 115°30'E. The perimeter is patrolled and the devices are marked by red flags and some are fitted with radar reflectors.

11.77 Vernon Bank (5°46'N., 115°03'E.), with depths of less than 11m, lies 5 miles NE of Samarang Bank and between 22 and 29 miles NW of Tanjung Kubong; the bank extends 12.5 miles in a NE and SW direction.

Two patches, with depths of 5 and 5.5m lie on the bank 1.3 miles and 0.3 mile, SW of the N end, respectively, of Vernon Bank. Currents in the vicinity of Vernon Bank are uncertain.

Fury Rocks (5°43'N., 115°02'E.), consisting of several coral heads, some awash, lie on the S part of Vernon Bank. The sea seldom breaks over these rocks in calm weather.

Several passages, with depths of more than 11m, run into the large area between Fury Rocks and the NW dangers of Vernon Bank.

Local knowledge is necessary for the use of these passages.

Vernon Bank has not been completely examined and less water than charted may exist.

Hankin Shoal (5°48'N., 115°11'E.), coral and sand, lies 4.5 miles E of the N part of Vernon Shoal. The shoal is 0.5 mile in extent with a least depth of 10.1m.

A 14.6m coral patch lies about 3.3 miles WSW of Hankin Shoal.

Mackenzie-Grieve Shoals (5°35'N., 115°11'E.), consisting of three shoals with depths of 7.8, 8.7, and 10.1m lie between 11 and 13.5 miles NNW of Tanjung Kubong.

A shoal, with a depth of 10.5m, and two shoals, each with a depth of 12.8m, lie between the above shoals and Gordon Patches.

Gordon Patches (5°36'N., 115°15'E.) consist of several shoals with depths of less than 11m. The shallowest spot, with a depth of 6.9m, lies 14.5 miles NW of Tanjung Toulak. The maximum reported current is 0.5 knot.

A small mud area, with a depth of 117m and marked by sulfur and hydrogen bubbles, lies in the middle of Gordon Patches 0.3 mile E of the shallowest spot.

Three patches, with depths of 12.8, 14.6, and 16.5m lie 2 miles ESE of the shallowest part of Gordon Patches.

Between Gordon Patches and Fury Rocks, 14 miles NW, there are many detached shoals and patches with depths of 8.7 to 18.3m, whose positions can best be seen on the chart. One of these shoals, Scott Patches, with a least depth of 12.3m, lie 5.3 miles NW of the shallowest part of Gordon Patches.

11.78 Jahat Shoals (5°35'N., 115°22'E.), consisting of numerous rocky patches with depths of less than 5.5m, lie between 8 and 10.5 miles WNW of Pine Point. Jahat Rock, which dries, lies near the middle of these shoals. A rock, with a depth of less than 1.8m, lies 0.6 mile SW of Jahat Rock.

Several detached patches, with depths of 8.7 to 12.8m, some of which are coral, lie between Jahat Shoals and Iris Shoals and can best be seen on the area chart.

Middle Patches (5°37'N., 115°19'E.), a group of four shoals with depths of less than 11m, and a least depth of 8.2m, lie about 3.3 miles NW of Jahat Rock.

Winchester Shoals (5°42'N., 115°21'E.), lying 15 miles WNW of Tanjung Nosong, consist of several patches close together, with a least depth of 3.2m on the N patch. At the S end, a shoal with a least depth of 10.1m, lies about 1.3 miles SSE of the N shoal patch, with two 11m patches in between.

Several patches, with depths of 11.9 to 16.5m, lie close W of Winchester Shoals.

The maximum current observed S of Gordon Patches and Winchester Shoals was setting N to NE at a rate of 1.5 knots.

Paisley Shoal (5°48'N., 115°20'E.), with a depth of 6.9m, lies 6 miles N of Winchester Shoals.

Growler Bank (5°40'N., 115°28'E.), with a depth of 8.2m, lies 8.3 miles WNW of Tanjung Nosong. A 12.8m patch lies 2.3 miles WSW of this bank.

A shoal, with a depth of 12.8m, lies 1.3 miles N of Growler Bank.

Nosong Shoals (5°43'N., 115°30'E.), with two islets near its center, lie about 7.3 miles NW of Tanjung Nosong. The SE and highest islet is 2m high. A drying patch lies 0.3 mile N of the highest islet.

Price Shoals (5°45'N., 115°32'E.), with depths of 9.1 and 8.2m, lie 3.3 miles and 4 miles, respectively, NE of the center of Nosong Shoals.

Tanjung Nosong to Kota Kinabalu

11.79 Pulau Tiga (5°44'N., 115°39'E.), 101m high, lies about 5.3 miles NE of Tanjung Nosong from which it is separated by Tiga Channel. The island is densely wooded, except for its SE peak. Reefs and shoals, some of which dry, fringe the island and extend 0.5 mile S and SE from it. A light is shown from a 25m high, white metal framework tower near the W end of the island. The light was reported extinguished.

A light is shown from an 8m high tripod, standing on the edge of the reef 0.5 mile from the SE end of Pulau Tiga.

Tiga Channel (5°41'N., 115°34'E.) is used by most of the shipping which runs up and down this coast.

A shoal, with a depth of 12.3m, was reported to lie about 3.3 miles W of Pulau Tiga.

A shoal, with a depth of 4.9m, lies 1.5 miles W of Pulau Tiga and near the outer end of a spit which extends W from that island.

Dunlop Shoal (5°42'N., 115°38'E.), with a depth of 5.5m, lies 2 miles S of the W end of Pulau Tiga and is marked by a lighted beacon. A 9.1m patch lies in between them.

Coleman Shoal (5°46'N., 115°35'E.), with a depth of 9.6m, lies 2.3 miles NW of the NW extremity of Pulau Tiga. A 12.8m patch lies 0.5 mile N of Coleman Shoal.

Tiga Shoals (5°46'N., 115°40'E.), of coral with depths of less than 11m, extend 4 miles NNE from Pulau Tiga. Several drying rocks mark these shoals.

Pulau Kalampunian Damit (Burong) (5°46'N., 115°41'E.), a rocky islet 34m high to the tops of the trees, lies 1.5 miles NE of Pulau Tiga.

Pulau Kalampunian Besar (5°45'N., 115°40'E.), 48m high to the tops of the trees, lies 0.5 mile S of the above islet.

Two rocks, which dry, lie 0.3 mile and 1.3 miles NNE of Pulau Kalampunian Damit.

Two shoals, with depths of 10.1m and 9.1m, lie about 2.3 miles and 3.3 miles, respectively, NNE of Pulau Kalampunian Damit.

11.80 Deluar Shoals (5°52'N., 115°42'E.) consist of two breaking patches, with depths of less than 5.5m which lie on a ledge, which extends from 6.3 to 10.5 miles NNE from Pulau Tiga. Several low, above-water rocks lie on the N patch of Deluar Shoals. A detached shoal, with a depth of 8.2m, lies 1 mile SW of the 0.6m high rock; a 12.8m patch lies 1.5 miles NE of the same rock.

Hayter Shoal (5°53'N., 115°34'E.), with a depth of 7.8m, coral, lies 10 miles NW of Pulau Tiga. The shoal is the southeasternmost SE of the Dampier Shoals. A detached 10.5m patch lies 0.3 mile S of Hayter Shoal.

Kimanis Bay (5°39'N., 115°45'E.) is entered between Tanjung Nosong and Tanjung Pagar, about 20 miles ENE.

Kuala Penyu, the entrance of the Sungai Penyu, lies 3.5 miles S of Tanjung Nosong. The entrance is obstructed by a bar with a depth of 1.2m, and by a bank with depths of less than 5.5m which extends 2.3 miles seaward.

Kuala Penyu (5°35'N., 115°36'E.) is marked by a beacon 1 mile offshore. Other beacons are marked in the Sungai Penyu for a mile to Kampong Kuala Penyu.

Sungai Penyu leads to Lake Sitombok, a shallow expanse of water, 1.5 miles within its entrance. Kampong Kuala Penyu is situated on the W bank of Sungai Penyu.

The shore of Kimanis Bay is low and swampy between Kuala Penyu and Tanjung Kinandukan, 2.3 miles SSW of Tanjung Pagar. For some distance inland, the country is flat and swampy or covered with dense jungle, particularly near the SE part of the bay.

Crocker Range and Suniatan Range, both densely wooded, lie from 13 to 17.5 miles inland from the E side of the bay, and slope on their W side to the low coastal plain. Suniatan Range rises to a height of 1,528m.

From Crocker Range, a serrated ridge extends NW and then N to **Tinamandukan** (5°38'N., 116°02'E.), 750m high, which is prominent from all directions.

Bukit Kilatuan (5°40'N., 115°58'E.), 467m high, with a round summit, and **Bukit Tebelong** (5°47'N., 116°03'E.), 619m high, with a bare conspicuous summit, lie 6.5 miles SSE and 9 miles E, respectively, of Tanjung Pagar. Several detached hills rise from the plain between Crocker Range and the coast but none are conspicuous.

Several small rivers discharge along the shores of Kimanis Bay but all shoal and can only be used by small boats. Some villages stand at the mouths of some of these rivers.

11.81 Peak of Kinandukan (5°43'N., 115°54'E.), close S of Tanjung Kinandukan, is 145m high and covered with dark trees which are prominent against the distant hills. The latter are often partly obscured by mist or rain. During the Northeast Monsoon (October to March), vessels can anchor in a depth of 14.5m, 1.5 miles SE of the S extremity of the W end of Pulau Tiga. During the Southwest Monsoon (May to September), they can anchor in depths of 18 to 20m, N of the sand spit at the SE extremity of the island or in depths of 22 to 26m, 0.5

mile E of Pulau Kalamunian Besar. Both monsoons raise a swell in Kimanis Bay.

Tides—Currents.—Tidal currents off the SE end of Pulau Tiga are irregular and apparently influenced by the currents set up in the offing by temporary or prevailing winds.

No current was experienced in Kimanis Bay. A NW set, with a rate of 0.5 knot, was observed off the mouth of the Sungai Papar close S of Tanjung Papar.

Anchorage.—There is good holding ground anywhere in Kimanis Bay. The best anchorage lies near the E side, where the depths are deeper close inshore and where the bottom is stiffer and less sandy.

11.82 Tanjung Pangalat (5°47'N., 115°58'E.), a densely-wooded bluff 88m high to the tops of the trees, lies 4.3 miles ENE of Tanjung Papar.

Pulau Lyang (Pulau Layang) (5°47'N., 115°53'E.), 31m high and bush covered, stands 1.5 miles NW of Tanjung Papar. This rocky islet stands in the middle of a shoal, which extends 0.3 mile E and W from it.

Sungai Kinarut (5°50'N., 116°00'E.), a small river of no importance, discharges 3.3 miles NE of Tanjung Pangalat. The intervening coast is fronted by a bank, with depths of less than 5.5m, which extends 1 mile offshore.

A village stands 1.5 miles within the mouth of the river.

Tanjung Dumpil (5°54'N., 116°02'E.), 5.5m high and marked by trees, lies 4.5 miles NNE of the entrance of the Sungai Kinarut. The bay which lies in between is fouled by drying reefs and shoals. A river discharges into the bay 1 mile S of the point.

Pulau Dinawan (5°51'N., 115°59'E.), 73m high and wooded, lies 1.3 miles NW of the entrance of the Sungai Kinarut. The island appears as three islets from seaward. Dinawan Anchorage lies E of Pulau Dinawan.

Flagstaff Point is the E extremity of the island and Costello Point, 0.3 mile to the N, is the NE extremity.

A low islet stands on a reef which dries in places and extends about 0.35 mile SSE of the S side of Pulau Dinawan. A drying coral reef lies on the SE edge of a bank, with a depth of 0.9m, which is located 0.5 mile SE of the S extremity of Pulau Dinawan. A 3.2m coral patch lies 183m farther SE. A reef, which dries in places, fringes the E side of the island, a bank extends 183m offshore from the N and W sides of the island.

Everett Reef (5°51'N., 115°59'E.), which dries in spots and which is marked by a low rock, lies 0.2 mile E of Flagstaff Point.

Small craft can anchor between Everett Reef and Flagstaff Point. The anchorage is entered through Flint Pass, S of Everett Reef. Anchorage can also be taken in a depth of 16.5m, about 0.25 mile NE of Costello Point.

Several drying coral reefs lie between the S end of Everett Reef and the coral reef, 0.5 mile SE of Pulau Dinawan. There are other drying reefs from 0.2 mile to 0.5 mile E of a line joining these dangers.

11.83 Pulau Sugura (Pulau Mantukud) (5°50'N., 116°01'E.), 109m high and densely wooded, lies near the outer edge of a drying mud flat which extends 0.3 mile N from the entrance of the Sungai Kinarut. Drying rocky ledges extend 0.5 mile NW from this islet.

A small islet lies 0.4 mile WSW of Pulau Sugura and a similar islet lies 0.5 mile S of the same islet.

Pulau Panduan (5°52'N., 116°02'E.), 6.1m high, stands on the drying coastal reef 1.3 miles NE of Pulau Sugura.

Tinson Reefs (5°52'N., 116°01'E.), coral, steep-to, and marked by some above-water rocks lie 1.3 miles SSW of Tanjung Dumpil.

Dumpil Rock (5°54'N., 116°01'E.), which dries, stands on a reef with depths of less than 2m, which lies with its outer edge 1 mile W of Tanjung Dumpil.

Tanjung Aru (5°57'N., 116°02'E.), low and flat, lies 3.3 miles N of Tanjung Dumpil. There is a small wooden jetty for boats at Tanjung Aru. Some drying rocks lie on a bank which extends 1 mile W from the point. Radio masts with red obstruction lights stand on a ridge of hills 1.5 miles E and SE of the point. The N mast is conspicuous.

A light is shown from the N end of a shoal, with a least depth of 0.9m, lying 1.3 miles WNW of Tanjung Aru.

The runway of Kota airport lies in a NNE-SSW direction with its S end 2 miles S of Tanjung Aru. No vessel or small craft should approach within 0.3 mile of the coast between the runway and Tanjung Dumpil.

The Sungai Simbulan and Sungai Karamunsing flow into the sea through a common entrance 2 miles ENE of Tanjung Aru. The intervening coast is low and fringed by drying banks and flats which extend from 0.1 to 0.4 mile offshore.

Several detached patches, with depths of less than 2m, lie between over a mile W and 1 mile NNE of Tanjung Aru. A patch, which dries in places, lies 0.5 mile NNE of the point.

Offshore Islands and Dangers

11.84 Pulau Sulug (5°58'N., 116°00'E.), 114m high, lies 2.3 miles W of Tanjung Aru and is fringed by a drying reef on its S side. Banks extend 0.2 mile N and 0.15 mile S from this island.

Pulau Manukan (5°59'N., 116°00'E.), 127m high and reef fringed, lies with its SW end 0.5 mile N of Pulau Sulug. A detached reef, with an above-water rock near its S end, lies about 0.3 mile E of Pulau Manukan. Drying reefs extend 0.2 mile from the E end of the island and 183m from its S side.

During N winds, anchorage can be taken off the S side of Pulau Manukan, in a depth of 26m, mud.

Pulau Mamutik (5°58'N., 116°00'E.), 33m high, lies 0.5 mile SE of Pulau Manukan. Reefs, some above-water, extend 0.3 mile S and 137m N from this island.

A reef, with a depth of 1.8m, is located about 0.35 mile SE, and another almost awash, lies 0.5 mile NE of Pulau Mamutik. A shoal, with a depth of 6.4m, lies 1,183m E of that island.

South Hill Rock (5°59'N., 115°52'E.), with a depth of 5m, coral, lies 10.5 miles W of Tanjung Aru and is steep-to.

Pulau Gaya (6°01'N., 116°02'E.), 304m high and densely wooded except for its summit which is bare, lies with Tanjung Wokong, its S extremity, 2.3 miles N of Tanjung Aru. The island is almost joined to the mainland to the SE by reefs, parts of which dry. South Channel, narrow and available only to small craft, leads through these reefs into Kota Kinabalu.

A shoal, with a depth 2.1m, marked by two beacons, lies on the N side of the approach to South Channel, 0.3 mile SE of Tanjung Wokong. A 6.4m patch lies 91.5m S of the shoal and a 2.3m patch lies close E of the shoal.

Karei Bay, fouled by reefs, lies in a small bight on the SE side of Pulau Gaya.

Between Tanjong Wokong and the SW extremity of Pulau Gaya, the S side of the island is indented by bights.

11.85 Pulau Sinjataan (6°01'N., 116°00'E.), 60m high and densely wooded, lies close off the SW end of Pulau Gaya to which it is connected by a flat which almost dries. Several shoal patches with depths of 10m and less, lie within 0.3 miles through W to NW of Pulau Sinjataan.

Edgell Patches (6°01'N., 115°59'E.), in two parts each with a least depth of 12.8m, lie 0.3 and 1 mile W of Pulau Sinjataan.

Tanjong Bulijong (6°03'N., 116°01'E.), the NW extremity of Pulau Gaya, lies 2 miles NNE of Pulau Sinjataan.

Pulau Gaya Light, a 24m high white, metal framework tower with red bands, stands 0.3 mile SSE of Tanjong Bulijong.

Pulau Sapangar (6°04'N., 116°04'E.), 180m high and heavily wooded, lies 2 miles NW of Tanjong Torajung, the NE point of Pulau Gaya. It is fringed by a bank which extends up to 0.3 mile offshore in places. A drying reef extends about 0.3 mile S from the E extremity of the central part of the island.

Pulau Udar Besar (6°05'N., 116°05'E.), 36m high and reef fringed, lies about 0.4 mile E of the N extremity of Pulau Sapangar. The channel which separates this island from Pulau Sapangar is narrow but deep.

Pulau Udar Kechil (6°06'N., 116°05'E.), 39m high, and Pulau Udar Priok, 21m high, lie between Pulau Udar Besar and the coast NE. These islets are connected to each other and the coast by a reef, with depths of less than 5.5m, on which there are several drying patches.

Sapangar Bay (6°05'N., 116°07'E.)

World Port Index No. 51691

11.86 Sapangar Bay is entered between Pulau Sapangar and Tanjong Tarak Tarak, about 2.5 miles ESE. The bay is sheltered and is available to all classes of vessels.



Courtesy of Sabah Ports Authority

Sapangar Bay Oil Terminal

Depths—Limitations.—Sapangar Bay Oil Terminal, a T-head jetty, situated at the NE section of the bay with a depth of

12.2m alongside, and accommodates vessels of 30,000 dwt. There is a dolphin off each end of the jetty. The jetty connects to the shore by a 0.2 mile approach bridge leading to a tank farm on the reclaimed land.

Cement Jetty, situated about 0.1 mile NE of the oil jetty, has facilities to handle cement and the export of timber. The cement jetty has depths of 10m on its N face.

Aspect.—A conspicuous building stands 0.3 mile E of Tanjong Tarak Tarak. A radio mast stands on Bukit Manawan, 6 miles farther E. Both exhibit red obstruction lights.

An industrial port has been developed on a reclaimed site on the E shore of Sapangar Bay.

Gantisan (6°05'N., 116°08'E.), a conspicuous grassy summit 248m high, stands 2.5 miles NE of Tanjong Tarak Tarak.

From Tanjong Tarak Tarak, the E side of the bay extends almost 1 mile NE to the Sungai Kabatuan. A conspicuous yellow patch is located on the hillside about 0.6 mile NE of Tanjong Tarak Tarak.

Coral reefs, some above-water, extend about 0.4 mile offshore from Tanjong Tarak Tarak and also from the coast between that point and the mouth of the Sungai Kabatuan.

The **Sungai Menggatal** (6°04'N., 116°07'E.) may be identified by a yellow sandstone bluff on its N side and by the sharp angle of the coast on the S side of the entrance. The river bar is very shallow, but the depths within the entrance increase rapidly.

From its entrance between the Sungai Menggatal and Tanjong Melanim, the inner part of Sapangar Bay extends 1.5 miles NE to its head. Coral reefs, some above-water, extend from 0.15 to 0.35 mile from the shores of this part of the bay. Several drying reefs lie within the 10m curve about 1 mile N of the mouth of the Sungai Menggatal.

Anchorage.—Anchorage can be taken in depths of 16 to 22m off the mouth of the Sungai Menggatal, but vessels can anchor anywhere in the bay according to the prevailing wind. During the Northeast Monsoon, secure anchorage is provided.

11.87 The N coast of the Pulau Gaya, between Tanjong Bulijong and Tanjong Torajun, about 2.3 miles ESE, is identified by two bays separated by Tanjong Merangis. A reef extends about 0.3 mile NE from Tanjong Torajun.

Gaya Bay (6°03'N., 116°04'E.), the name given to the water area to the SW of Sapangar Bay, is entered from seaward between the S end of Pulau Sapangar and Tanjong Torajun.

Tanjong Lipat (6°00'N., 116°05'E.) lies 2 miles SW of **Tanjong Lita** (6°02'N., 116°06'E.). From Tanjong Tarak Tarak, the E side of the bay extends S for almost 1.5 miles to Tanjong Lita. Between this point and Tanjong Lipat, about 2 miles SW, the coast recedes to form a shallow bay most of which dries. Sungai Inanam, which is available only to boats, flows into this bay.

A flat, almost awash in places with a reef on its outer part, extends about 0.65 mile W from Tanjong Lita. An above-water rock lies on the N part of the reef and a similar rock lies on its S part.

A coral patch, with a least depth of 2.7m, lies 1 mile SW of Tanjong Lita. A detached 7.3m patch lies 0.5 mile WNW of Tanjong Lita.

Tanjong Sindian (6°00'N., 116°04'E.), the E extremity of Pulau Gaya, lies 1 mile SSE of Tanjong Logong. Gaya Harbor

lies between this latter point and the reef to the North. Steep-to reefs, almost awash, extend 0.3 mile offshore from the head of the harbor.

Creighton Patch (6°01'N., 116°05'E.), with a least depth of 8.6m, lies 1.5 miles WSW of Tanjong Lita.

Kota Kinabalu (5°59'N., 116°04'E.)

World Port Index No. 51690

11.88 Kota Kinabalu, the principal port on the NW coast of Borneo, is the capital of the state of Sabah. The harbor comprises the area lying between the E side of Pulau Gaya to the W, the Borneo shore to the SE, and the shallow ridge connecting Pulau Gaya to the mainland to the SW. The harbor is partly exposed to the N, but receives some protection from Pulau Sapangar and the reefs extending from the NW side of the entrance. The main approach is made through Gaya Bay, but small local craft can enter from the SW through South Channel.

Depths within the harbor, seaward of the fringing reefs, range from 11 to 22m.

Ample alongside berthing facilities are provided for vessels capable of entering the harbor.



Courtesy of Sabah Ports Authority

Kota Kinabalu

Tides—Currents.—Tidal heights above datum of soundings are, as follows:

MHHW	1.7m
MLHW	1.2m
MHLW	1.1m
MLLW	0.5m

Depths—Limitations.—On the W side of the harbor, a reef extends about 0.3 mile E and SE from Tanjong Logong. On the E side of the harbor the coastal bank extends up to 0.2 mile offshore between Tanjong Lipat and Government Wharf. The charted 5.5m curve was reported to lie 61m farther W in the area NE of the wharf.

Normanhurst Reef, with a depth of 1m, lies about 0.35 mile NW of Tanjong Lipat.

Comber Reef, with a least depth of 0.5m, lies between Normanhurst Reef and Tanjong Lipat.

Gueritz Shoal, with a depth of 2.5m, lies 191m WNW of Tanjong Lipat.

Grieve Reef, with a depth of 1.5m, lies about 0.5 mile ENE of Tanjong Sindian.

Drying reefs extend 0.3 mile ESE of Tanjong Sindian. A detached reef, with a least depth of 0.3m, lies 0.4 mile ESE of Tanjong Sindian.

Harris Reef (6°00'N., 116°04'E.), with a depth of 0.3m, lies 0.5 mile ESE of Tanjong Sindian.

Snake Rock, 0.9m high, lies on a reef 0.5 mile S of Tanjong Sindian. Coral shoals, some marked by stakes, lie SSW of Harris Reef. Four detached shoals, with depths of 0.3 to 4.3m, lie up to 0.35 mile W of Old Wharf (Government Wharf). A beacon stands on the N extremity of the 0.4m shoal, 183m W from the S end of the wharf.

Old Wharf (5°59.5'N., 116°04.5'E.), charted as Government Wharf, an L-shaped open wooden pile structure, is situated at the N end of town. It was reported closed.

Two dolphins stand off the S end of the wharf and oil installations stand close E of it.

South Jetty, 0.15 mile NE of Old Wharf, is an L-shaped jetty with three berths numbered 10, 11, and 12. The longest, No. 11, occupies the outer SW face. Depths on the berths range between 5.5m and 7.5m.

Main Wharf, 0.4 mile NE of Old Wharf, is a rectangular island wharf fronting the coast to which its S portion is connected by two roadways. It provides a total of 7 berths, on 4 faces, the outer and longest face of 0.2 mile on the NW side. Depths on the berths range between 7.6 and 9.4m.

A red obstruction light is reported to be shown from the Marine Tower in the center of the wharf.

North Jetty, 93m in length, is situated 191m NE of Old Wharf. This jetty, which extends NNE, is connected to the shore by a bridge 183m in length. There are berths on each side of the jetty, the W berth has alongside depths of 5.4m, and the E berth alongside depths of 5m. A light is shown from a mooring dolphin 30m NNE of the jetty head.

Ro-Ro Terminal lies close W of the root of North Jetty and accommodates vessels up to 180m long, 25m beam, and 5.5m draft.

The Marine Police Jetty, with a T-head and a reported depth of 7.3m alongside, projects 183m from the shore 0.13 mile SSW of Old Wharf (Government Wharf).

A jetty extends 0.2 mile N from Tanjong Lipat.

Aspect.—A building stands on the range of hills backing the town, 0.3 mile SW of Tanjong Lipat. The signal station at the inner end of Old Wharf (Government Wharf) is conspicuous. A combined radiomast and a red and white banded flagstaff stand on the station. The two hotels in the town are also conspicuous.

Kota Kinabalu is approached through an extensive bight formed between the NE side of Pulau Gaya and a mainland projection about 5 miles to the NE. Pulau Sapangar, a densely wooded island, lies just to the N of the middle of this bight; that part of the bight to the E of this island is known as Sapanpar Bay and the part to the S is known as Gaya Bay.

The depths in the channel S of Pulau Sapangar and through Gaya Bay are ample for vessels of any draft, and with the exception of Creighton Patch there are no detached dangers along this route.

Tanjong Gaya, the W extremity of the peninsula on the NE side of the approach, stands almost 5.3 miles NE of Tanjong Bulijong. This heavily wooded bluff rises sharply to Bukit Penaga, a high peak, about 0.3 mile to the ESE.

From Tanjong Gaya, the coast extends SSE for a distance of 2 miles to Tanjong Melanim, the W entrance point of the inner part of Sapangar Bay. Several coral patches, with a least depth of 11m, lie about 1 mile S of Tanjong Gaya and about 0.3 to 0.5 mile off the coast.

Pilotage.—Pilotage is not compulsory. Pilots are available between sunrise and sunset. When within range, vessels should confirm their ETA and pilotage requirements through the port radio station.

Signals.—Berthing signals are displayed from the signal station flagstaff. Flag "B" will be displayed at the signal station when a vessel loaded with inflammable or dangerous cargo is berthing or unberthing.

Anchorage.—Good anchorage is provided in depths of 16.5m, 0.3 mile NW of Grieve Reef. During the Northeast Monsoon, secure anchorage is provided in Sapangar Bay.

Anchorage is prohibited within 0.5 mile of the Old Wharf (Government Wharf) in Kota Kinabalu Harbor. Vessels of less than 46m in length may anchor E of a line joining the head of Old Wharf and Gueritz Shoal.

A dangerous petroleum anchorage area, about 1 mile long in a E to W direction and about 0.3 mile wide, lies centered about 1 mile NNE of Gueritz Shoal.

An explosives anchorage area of the same dimensions lies N of and adjacent to the dangerous petroleum anchorage area. The quarantine anchorage, a circular area with a radius of 0.5 mile, lies with its center 1 mile N of Tanjong Logong.

Directions.—Vessels approaching Kota Kinabalu should give the N coast of Pulau Gaya a berth of 0.3 mile and pass the extremity of the reef SE of Tanjong Logong at a safe distance; then pass between the light structure on Grieve Reef and Gueritz Shoal and then proceed to the Old Wharf.

Caution.—It has been reported that swells from the Southwest Monsoon cause significant ship motion at the container pier.

Tanjong Gaya to Pulau Usukan

11.89 Gunung Kinabalu (Mount Kinabalu) (6°05'N., 116°33'E.), 4,100m high and the highest elevation in Borneo, stands 28 miles E of Tanjong Gaya.

This peak is very conspicuous and may be seen in clear weather for a considerable distance.

The summit, which is usually obscured by clouds for the better part of the day, consists of a number of serrated peaks of

almost equal height; N of these peaks it slopes gradually for about 4 miles and then falls away abruptly.

Gunung Sadok Sadok (6°06'N., 116°29'E.), 1,676m high, stands 4.5 miles W of Gunung Kinabalu. From the N, this peak appears as a sharp cone.

Tanjong Kaitan (6°07'N., 116°05'E.) lies about 1 mile NE of Tanjong Gaya.

Sungai Mengkabong, of no commercial importance, is entered about 2.3 miles ENE of Tanjong Kaitan. A bank, with depths of less than 5.5m, extends 0.3 mile seaward from the mouth of the river.

Tanjong Dalit (6°10'N., 116°08'E.) lies 3.3 miles NE of Tanjong Kaitan. Bukit Dalit, 112m high to the top of the trees, stands close within the point.

Tanjong Indai (6°14'N., 116°11'E.) lies 5.3 miles NE of Tanjong Dalit. The intervening coast is low, sandy, and covered by trees.

Tanjong Torong Gusu (6°15'N., 116°13'E.) lies 1 mile ENE of Tanjong Indai. An islet, 24m high, stands between these points.

Tungai Sulaman (6°15'N., 116°13'E.) is entered between Tanjong Indai and the partly drying and breaking sandbanks which extend 1.3 miles W from Tanjong Torong Gusu. The entrance channel is 0.15 mile wide. Within the entrance, a 3 mile long channel, with depths of more than 5.5m, leads to Sulaman Harbor. This harbor is shallow, fouled by flats and surrounded by mangrove swamps.

The muddy water, discharged from the small rivers which lie along this section of coast, extends up to 5 miles offshore where its limit is clearly defined.

Good anchorage can be taken about 0.5 mile offshore anywhere between Tanjong Gaya and a position about 1 mile S of Tanjong Indai, except off the mouths of the rivers.

Tanjong Tembungo (Junction Bluff) (6°17'N., 116°14'E.), lies 3 miles NE of Tanjong Torong Gusu. Lamas (Mount Lokpussok), a prominent, densely-wooded peak, 436m high, stands 0.3 mile to the SE.

Tanjong Kombongo (6°18'N., 116°16'E.) is the extremity of a small peninsula, 109m high, 2.5 miles NE of Tanjong Tembungo.

A rock, 3m high, lies 1 mile ENE of Tanjong Tembungo and about 91m offshore.

Tanjong Torong Semburong (6°19'N., 116°17'E.), lies 3.5 miles NE of Tanjong Tembungo. It is a fairly bold headland, rising to an elevation of 167m, 0.5 mile from its extremity.

Caution.—Vessels coasting should keep at least 2 miles off Tanjong Indai and the coast N of it, because there are reports from vessels of the shifting nature of the banks.

During the strength of the Northeast Monsoon (December to February), a strong current has been observed setting NE at a distance of 7 miles offshore.

Off-lying Islands and Dangers

11.90 Pulau Mengalum (6°12'N., 115°36'E.), low and tree covered, 52m high, lies 26 miles WNW of Tanjong Bulijong. The island is surrounded by coral reefs except near its SE side.

Anchorage can be taken close off the SE side keeping a good lookout for shoals.

A small fishing village stands near the NW extremity of the island. During the fair weather season, numerous fishermen operate from the island.

Caution.—Sandwaves are reported (1997) to exist in the channel NE of Pulau Mengalum.

A bank, with depths of less than 11m, extends 4 miles W and 2.5 miles SW from Pulau Mengalum.

Foul ground extends 1 mile E and NE from Tanjung Timor Laut, the NE end of the island. A bank, with depths of less than 11m, extends 2.5 miles NE of Pulau Mengalum.

A bank, with a depth of 5.9m, lies 2.5 miles N of the island. Another bank, with a depth of 7.8m, lies 2.5 miles WNW of Pulau Mengalum.

11.91 Ketam Oil Field (6°06'N., 115°36'E.) lies 5 miles S of Pulau Mengalum. A light is shown from the platform in the field and a flare stack stands close E. The pipeline from Tanjung Punei to Barton Oil Field passes close W of this platform.

Erb West Oil Field (6°26'N., 115°39'E.) is situated 9 miles NNE of Pulau Mengalum. The platforms on the field are lighted.

The pipeline from Tanjung Punei, as stated above, also passes through this oil field.

Saracen Bank (6°10'N., 115°22'E.), an extensive coral bank with depths of 1.8 to 9m, and marked by above and below-water rocks, lies 11 miles SW of Pulau Mengalum.

An oil drilling rig stands near the N end of the bank and another one stands near the S end. At night, lights may be seen on these rigs.

A bank, with a depth of 22m, lies 4 miles WSW of Saracen Bank.

Dampier Shoals (6°00'N., 115°30'E.), with depths of 6.4 to 18.3m, extend in a SE direction from Saracen Bank for 18 miles and terminate in Hayter Shoal. The shallowest head on Dampier Shoals lies 10 miles SSW of Pulau Mengalum.

Collins Shoals (5°57'N., 115°33'E.), forming the S part of Dampier Shoals with a least depth of 9.4m, lies 14 miles SSW of Pulau Mengalum.

Passage through these waters should not be attempted except during daylight in fine weather, when the shoals are usually visible. Soundings give very little warning of the proximity of these shoals.

Rizal Shoal (6°15'N., 115°26'E.), an extensive area with depths of less than 11m, lies with its shallowest part 10 miles WNW of Pulau Mengalum.

The least known depth over this shoal is 6.7m near its steep-to W side. Several shoals, with depths of 8.7 to 11m, lie between Rizal Shoal and the bank W of Pulau Mengalum.

Sunken Barrier Shoals (6°25'N., 115°53'E.) are a chain of coral shoals, with depths of 7 to 16m, with deep water in between, lying between Pulau Mengalum and Mantanani Islands, 51 miles to the NE. Vessels should not attempt to cross these shoals.

Passage between Sunken Barrier Shoals and the mainland, about 16 miles SE, is believed to be clear of off-lying dangers beyond a distance of 5 miles from the coast.

11.92 Southwest Sunken Barrier Shoal (6°17'N., 115°48'E.), with a depth of 7.8m, is an extensive coral bank.

The shallowest head (6°15'N., 115°43'E.) lies 22 miles NW of Pulau Gaya.

Francis Bank (6°23'N., 115°53'E.), with a depth of 10.1m, lies 25 miles W of Tanjung Torong Semburong.

A depth of 7.8m on an extensive bank lies near the N extremity of Southwest Sunken Barrier Shoal, about 6 miles NW of Francis Bank.

Bunbury Shoals (6°28'N., 115°56'E.), with a depth of 7.3m, lie 2 miles NW of Francis Bank.

Saint Joseph Rock (6°35'N., 116°05'E.), awash, lies near the SW extremity of coral shoal, with depths of 4.6 to 11m, 8 miles NE of Bunbury Shoals. The rock lies near the middle of an extensive bank, with depths of 9.1 to 37m, which extends 6.5 miles W and 7 miles NE from the rock.

Saint Joseph Oil Field (6°38'N., 116°09'E.) lies 5.5 miles E of Saint Joseph Rock. Lighted platforms are situated in the area where the pipeline from Tanjung Punei leading to Barton Oil Field passes through here via South Furious Oil Field.

Pritchard Bank (6°39'N., 115°59'E.), with depths of 22 to 37m, lies 7 miles NW of Saint Joseph Rock.

Royds Shoal (6°38'N., 115°50'E.), with a depth of 11.9m, coral, and small in extent, lies 10 miles WNW of Saint Joseph Rock.

Tembungo Oil Field (6°37'N., 115°47'E.) is situated about 3 miles W of Royds Shoal and consists of a production platform. The production platform gives a good radar response up to a range of 30 miles and is brightly illuminated at night. A submarine oil pipeline runs SSW from the production platform to another in Erb West Oil Field. Ships should not anchor on the banks E and S of it, as there are inadequately surveyed coral patches.

Numerous detached patches, with depths of 14.6 to 37m, lie between Sunken Barrier Shoals and the mainland. A detached 14.6m shoal lies 13.5 miles WNW of Tanjung Torong Semburong. The positions of the other shoals can best be seen on the area chart.

Teluk Ambong (6°20'N., 116°18'E.) is entered between Tanjung Torong Semburong and **Tanjung Perunjuk** (6°20'N., 116°19'E.), 1.3 miles to the E.

Belcher Shoal, with a least depth of 0.9m, coral, lies 0.3 mile NNE of Tanjung Torong Semburong. A shoal, with a depth of 2.3m, lies 0.4 mile N of the same point. A 5.5m patch lies 0.15 mile SSW of Tanjung Perunjuk.

11.93 Pulau Egot (6°18'N., 116°18'E.), a densely wooded islet 71m high, stands at the head of Teluk Ambong, and divides it into two coves. Close S of the head, a range of hills rises to a height of 382m, 1.3 miles SE of Tanjung Perunjuk. The twin peaks of Gunung Rigi stand at the W end of this range 2.5 miles SSE of Tanjung Torong Semburong. The highest peak is 311m high.

The reefs, which fringe the shores of the bay, extend up to 0.4 mile offshore; some of these reefs dry.

Large vessels can anchor 0.5 mile SW of Tanjung Perunjuk, mud, partially sheltered from the swell raised by either monsoon.

Smaller vessels can anchor in the middle of either cove at the head of the bay, but space is very limited.

Directions.—When approaching, Telok Ambong from the N, keep Gunung Kinabalu, if visible, bearing 135°, or Tanjung

Perunjuk bearing about 151°, either of which leads NE of Belcher Shoal. Then steer to pass not less than 0.3 mile W of Tanjong Perunjuk and then steer for the anchorage.

When approaching from the SW, steer for Pulau Pandan Pandan in range, bearing 064°, with Robertson Hill, a prominent grassy summit 187m high, 1.3 miles NE, which leads NW of Belcher Shoal. When Tanjong Perunjuk bears more than 135°, the above directions should be followed.

Tengah Bay (6°20'N., 116°19'E.) and Saundal Bay lie between Tanjong Perunjuk and Tanjong Sannoal, about 2 miles to the N. These small bays are separated from each other by a narrow peninsula terminating in Tanjong Tengah, 47m high. Shelter is provided during E winds. A village stands at the head of Tengah Bay.

Pulau Pandan Pandan (6°21'N., 116°18'E.), a conspicuous, sandstone-cliffed island, 46m high and densely wooded, stands 0.3 mile S of Tanjong Saundal and close within the outer edge of a coral reef that extends S from the point. The extremity of the reef lies about 0.15 mile SE of Pulau Pandan Pandan.

From Tanjong Saundal, the coast extends NE for 1.3 miles to Tanjong Kaduko, the S entrance point of Usukan Bay. This section of coast forms the NW side of a prominent headland which separates Saundal Bay from Teluk Usukan. This headland rises to Robertson Hill, which has a conspicuous grassy top.

Preston Shoal (6°22'N., 116°18'E.), with a depth of 4.9m, lies almost 1 mile NW of Pulau Pandan Pandan.

An 8.5m patch lies about 0.4 mile N of Tanjong Saundal and about 0.3 mile offshore.

A rock, which dries 1.5m, lies near the edge of a shallow spit, located 1.5 miles N of Pulau Pandan.

Isolated 5.5m patches lie in the vicinity of this drying rock and a coral patch, with a least depth of 5.8m, lies about 0.2 mile NW of the rock.

The extremity of Abai Bluff, bearing 068°, and seen between Pulau Usukan and the mainland, leads NW of these dangers.

Pulau Usukan (6°25'N., 116°20'E.), 127m high and densely wooded, stands on the N side of Usukan Bay, 1.5 miles N of Tanjong Kaduko. This conspicuous island appears as a black bushy cone.

Near it, the rounded summits of the mountains on the mainland appear to rise from the level plain. This feature identifies Usukan Bay and Ambong Bay when viewed from the N.

11.94 Teluk Usukan (6°22'N., 116°20'E.) (*World Port Index No. 51700*) is the best protected anchorage on this coast N of Gaya Bay. A light is shown from a white, metal framework tower situated on the W end of Pulau Usukan.

A bank, with depths of less than 5.5m, extends 0.3 mile SW from W extremity of Pulau Usukan. Iris Rock, which dries 0.9m, and Slime Rock, 4m high, lie on this bank 0.3 and 0.5 mile SW; respectively, of the W extremity of Pulau Usukan.

A 7.3m steep-to, coral shoal, lies in the outer part of the bay, 10.2 mile NE of Tanjong Kaduko.

A drying sandspit connects the SE end of Pulau Usukan to the extremity of a peninsula on the mainland to the S.

A hill, 198m high to the treetops, and a hill with a grassy summit, 143m high, stand 1.5 miles SE and 1.3 miles E, respectively, of Tanjong Kaduko. Both hills are prominent.

Small coastal vessels can berth alongside a rubble jetty in the E corner of the bay.

Anchorage.—Anchorage can be taken in a depth of 14.6m, mud, about 0.55 mile W of the jetty. Small vessels can anchor in a depth of 12.8m about 0.3 mile S of this position, where they will be sheltered from the prevailing swell during the summer.

Directions.—When approaching Usukan Teluk from the W, steer 068° for Abai Bluff, and seen between Pulau Usukan and the mainland, the point 0.5 mile ESE of Tanjong Kaduko bearing 111°, opens NE of Tanjong Kaduko. Then steer 096° for the jetty until NE of Tanjong Kaduko, at which time course may be altered for the anchorage.

When approaching from the N and having passed Alert Rock, steer 187° for Pulau Pandan Pandan, and open W of the point 0.35 mile NNE of the islet. This leads 0.3 mile W of the dangers off Slime Rock. When Slime Rock bears 050°, alter course for the jetty, bearing about 104°, which leads 0.18 mile S of the 7.3m shoal in the bay and then to the anchorage.

Pulau Usukan to Tanjong Sempang Mangayau

11.95 Kuala Abai (6°24'N., 116°21'E.), a shallow bay, is entered between Pulau Usukan and Abai Bluff, about 1 mile SE, and has a least depth of 1.2m on its outer bar.

The Sungai Abai, a shallow river, empties into the head of the bay and the village of Abai stands on the W side of the bay near Abai Bluff. Only small boats can use the bay and the river.

From Kuala Abai, the coast extends about 12 miles NE to Tanjong Lokpadang and is densely wooded.

The Sungai Tempasuk and the Sungai Pandasan, two shallow rivers available only to boats, discharge along this section of coast.

Alert Rock (6°25'N., 116°20'E.), which breaks, lies 1.5 miles N of Pulau Usukan Lighthouse. This steep-to rock dries 1.8m. Rocky spits, with depths of less than 9m, extend 0.15 mile S from the rock.

The inner E entrance point of the Sungai Abai, bearing 160°, open E of the E extremity of Pulau Usukan, leads E of Alert Rock.

Mayne Rock (6°28'N., 116°18'E.), with a depth of 2.7m, lies 3 miles NW of Alert Rock.

Arsat Rocks (6°30'N., 116°26'E.), which generally break, consist of two small rocks which dry 2.4m, lying 8.5 miles NE of Pulau Usukan. A shallow spit, with a depth of 3.7m, extends 0.25 mile NE from these rocks.

The SE extremity of Pulau Usukan in range, bearing 216° with Tanjong Kaduko, leads 0.3 mile NW of Arsat Rocks.

North Hill Rock (6°28'N., 116°18'E.), with a depth of 1.8m, coral, lies 2.5 miles NNE of Alert Rock.

Kranga Point (Tanjong Lokpadang) (6°32'N., 116°30'E.) is a fairly high sloping grassy point rising to a height of 286m 2 miles ENE of the point, 12.5 miles N of Pulau Usukan.

Ant Islets (6°32'N., 116°30'E.), two in number, lie on the outer end of a reef which extends 0.5 mile N from Kranga Point. One of the islets is 23m high.

Ant Rocks consist of two groups of drying rocks lying 0.3 mile and 1.3 miles NW of Kranga Point. A 5.5m patch lies 1 mile NNW of Kranga Point. A 12.2m shoal lies 3 miles WNW of the same point.

11.96 Umpohl Shoals (6°34'N., 116°29'E.), with a depth of 7.9m, lie 2 miles N of Kranga Point.

Aspect.—This stretch of coast is backed by an extensive range of hills, the bases of some reaching the coastline. The Sir James Brooke Range extends about 16.5 miles N from a 1,038m peak located about 15 miles E of Usukan Bay, to **Mount Cochran** (6°37.5'N., 116°38.5'E.), a rounded 793m peak.

Included in this range is a rounded 1,207m peak lying close NE of the 1,038m peak, and Gunung Madalong, a rounded 1,128m peak, which stands 7.3 miles N of the same peak. The island between the S part of the Sir James Brooke Range and the coast is low. Up to about 14 miles N of Mount Cochran, the hills gradually decrease in height and finally terminate in a flat plain.

About 6.5 miles farther N, the land again becomes hilly, some of the peaks rising to heights of almost 244m.

Tanjong Dudar (Gasap Point) (6°37'N., 116°33'E.) lies 5.5 miles NE of Tanjong Lokpadang. Depths of less than 5.5m extend up to 0.5 mile offshore between these points.

A shoal, with depths of less than 1.8m, lies 0.5 mile WSW of Tanjong Dudar. A drying coral reef lies 0.5 mile NNE of the same point.

Pulau Silad (Bisa Island) (6°39'N., 116°34'E.), a thickly wooded islet, 34m high, composed of black basalt, is joined to a point on the mainland 3 miles NE of Tanjong Dudar at LW.

A 14.6m coral patch lies 2.5 miles W and another patch, with a depth of 11m, lies 1 mile NW of Tanjong Dudar.

Two coral shoals, with depths of 3m and 3.4m, lie 0.5 mile and 1.3 miles, respectively, SW of Pulau Silad. A pinnacle rock, with a depth of 11m, was reported to lie 2 miles NW of Pulau Silad.

11.97 White Rocks Bay (6°43'N., 116°38'E.) is entered between Pulau Silad and Tanjong Indarasan (Tanjong Jahat), about 7 miles NE. The approaches to the bay are fouled by reefs, rocks, and shoals.

Harry Shoals (6°41'N., 116°36'E.), with a least depth of 2.1m, lie 2.5 miles NE of Pulau Silad. These shoals are almost joined to a spit extending from the mainland.

Beehive Rocks (Batu Laya Laya) (6°42'N., 116°37'E.) are two conspicuous rocks which stand near the outer end of the coastal reef on the SE side of the bay. The 11.6m high SW rock stands 4 miles NE of Pulau Silad. The NE rock, 10.3m high, stands 0.7 mile farther NE. A rock, awash, lies 0.2 mile NNW of the SW rock.

White Rocks (6°42'N., 116°36'E.), a conspicuous group of rocks 13m high, stand 3.5 miles NNE of Pulau Silad. Reefs, with depths of less than 11m, extend 2 miles N and 1.3 miles SSW of these rocks.

White Rocks Reef (6°44'N., 116°36'E.), which dries, lies near the N extremity of the above reefs. A detached 6.4m rocky patch lies 1 mile W of White Rocks.

A 7.3m patch lies in the N entrance of the bay 1 mile WSW of Tanjong Indarasan. In 1961, a vessel reported a 5.5m patch lying 1.3 miles SSW of this point.

Anchorage.—Anchorage can be taken, in a depth of 20m, near the middle of the bay, 1.5 miles NE of White Rocks.

Directions.—When entering by the S entrance, keep the NW extremity of Pulau Silad bearing 217° astern, until the SW

Beehive Rock bears about 081°, at which time course can be altered for the anchorage.

When entering by the N entrance, steer 154° for the NE Beehive Rock, then anchor as convenient near the middle of the bay.

Off-lying Islands and Dangers

11.98 The Mantanani Islands are a group of coral islands formed by reefs, which lie on a bank about 14 miles WNW of Pulau Silad.

Pulau Mantanani Besar (6°43'N., 116°21'E.), the E island of the group, is low, flat, and densely wooded, except near its NW end where it rises abruptly to a well-defined wooded ridge, 63m high. Pulau Lungisan, 39m high, lies close W of Pulau Mantanani Besar.

Pulau Mantanani Kechil (6°42'N., 116°18'E.), the W island, is wooded; the trees near its W end are 49m high. A 1.2m high rock lies close off its W extremity. A light, shown from a 5m high round stone tower, stands near the W end of this island.

Good anchorage can be taken on either side of these islands, according to the monsoon.

A number of detached patches, with depths of from 9.6 to 19.8m, lie within 3.5 miles of the Mantanani Islands, as can be seen from the area charts. A 12.8m coral patch lies 5.5 miles WSW of the light.

Caution.—Less depths than charted may exist in the vicinity of the Mantanani Islands.

11.99 South Furious Shoals (6°47'N., 116°12'E.) consist of a number of steep-to, detached coral banks lying between 4.5 miles NNW and 13 miles WNW of Mantanani Islands Light.

The westernmost and largest of these banks has a least depth of 12.8m. The next bank to the E has a similar depth.

The three other banks lying to the E have depths ranging from 12.8 to 14.6m. The depths around and between these banks are very irregular and shallower depths than charted may exist.

South Furious Oil Field (6°47'N., 116°14'E.) is situated 6 miles NW of Mantanani Islands lighthouse. Within the oil field lights are shown from the production platforms and also shown from other structures. A submarine pipeline is laid SW from the oil field, passing W of Sunken Barrier Shoals, then E of Pulau Mengalum, and continuing SSW to the oil terminal near Tanjong Punei. This pipeline also connects the South Furious Oil Field with Barton Oil Field, lying 7.5 miles ENE.

Barton Shoal (6°51'N., 116°23'E.), with a least depth of 11.9m, coral, lies 9.5 miles NNE of Pulau Mantanani Kechil Light.

Barton Oil Field (6°50'N., 116°20'E.), with lighted production platforms, lies 2 miles WNW of Barton Shoal.

A submarine pipeline runs SW approximately 138 miles from a production platform to Tanjong Punei through various other oil fields.

Dolphin Bank (6°46'N., 115°58'E.), with a least depth of 22m, sand and coral, lies 20 miles WNW of Pulau Mantanani Kechil Light.

11.100 Emerald Shoals (6°56'N., 116°08'E.), so named because of their bright green color on the NW side, lie between 13 miles and 22 miles NW of the Mantanani Islands. They consist of an extensive area of coral heads marked by depths of 7.8 to 25.6m. The coral heads are so numerous and steep-to that it is possible that less water may exist within the charted limits.

The shallowest head (7.8m), discovered so far, lies near the NE side of Emerald Shoals. Three 10.5m coral heads lie 9 miles WSW, 2.3 miles NW, and 2.3 miles S of the shallowest head.

Several detached banks, with depths of 27 to 37m, lie between Emerald Shoals and Dolphin Bank.

Tanjong Ganda (Tanjong Dandulit) (6°47'N., 116°38'E.), a rocky bluff, is located about 2 miles N of Tanjong Indarasan. A bank, with depths of less than 5.5m, extends up to 0.3 mile offshore between these points. A detached shoal, with a depth of 7.3m, lies 1.3 miles SW of Tanjong Ganda.

A drying reef extends 0.3 mile NNE from Tanjong Ganda. Two rocks, one 5m high, stand at its N end.

Tanjong Tambuluran (6°52'N., 116°38'E.), lying 5 miles N of Tanjong Ganda, is low and difficult to make out.

Teluk Agal (6°49'N., 116°39'E.) lies in the bight between Tanjong Ganda and Tanjong Tambuluran. A 4.6m coral patch lies 1.5 miles N of Tanjong Ganda. A 10.1m coral patch lies 1.5 miles farther N.

The bay is obstructed by reefs which extend from both shores.

Secure anchorage is reported in Teluk Agal for small craft with local knowledge in a depth of 7.3m.

Batumandi Rock (6°52'N., 116°36'E.), marked close S by a lighted buoy, 16m high, composed of yellow sandstone and surrounded by a steep-to reef, lies 0.3 mile W of the outer end of a reef which extends 1.3 miles W of Tanjong Tambuluran. Several above water rocks stand on this reef.

A rock, with a depth of less than 1.8m, lies 0.5 mile NW of Batumandi Rock; a drying rock lies in between. A 8.2m coral patch lies 1.5 miles SSE of Batumandi Rock.

11.101 Tanjong Bangau (6°57'N., 116°42'E.), a black rocky promontory 125m high, lies 6.5 miles NE of Tanjong Tambuluran. Hills rise E of Tanjong Bangau, attaining a height of 241m 2.5 miles NE of the point, and extend to Tanjong Sempang Mangayau.

Two detached cliffs, one 9.1m high and of reddish color, and the other 15.2m high and white lie 1 mile and 2.3 miles ENE, respectively, of Tanjong Tambuluran. These cliffs are the only distinctive features on this part of the coast.

The coast between Tanjong Tambuluran and Tanjong Bangau is fronted by foul ground and shoal depths which extend up to about 1.3 miles offshore in places.

Heavy rollers exist off the coast between Tanjong Tambuluran and Tanjong Sempang Mangayau, lying 13 miles NNE.

Tanjong Kadua, the W end of a small islet which lies close offshore, and Tanjong Tiga Papan lie about 2.5 miles and 3.3 miles, respectively, NNE of Tanjong Bangau. Tanjong Tiga Papan rises to a height of 134m about 0.5 mile E of its extremity.

Tanjong Sempang Mangayau (7°02'N., 116°45'E.), the NW point of Borneo, lies about 1.3 miles N of Tanjong Tiga Papan. It may be identified by its grassy bluff.

North Furious Shoals (7°02'N., 116°19'E.), with a least depth of 12.8m, coral, and surrounded by very irregular depths, lie 26 miles W of Tanjong Sempang Mangayau and extend 4 miles NW.

Harington Shoal (7°02'N., 116°30'E.), with a least depth of 12.8m, coral, lies centered about 14.3 miles W of Tanjong Sempang Mangayau.

11.102 Big Bonanza Shoal (7°06'N., 116°23'E.), with a least depth of 4.6m on its E part, lies about 17.3 miles WNW of Tanjong Sempang Mangayau. Depths of less than 18m extend 5.3 miles W and about 1.3 miles ESE from this least depth.

Depths of 20m lie 4 miles N of the shallowest head of Big Bonanza Shoal.

A depth of 37m was reported to lie 10 miles N of the shallowest head of Big Bonanza Shoal. A depth of 36m was reported to lie 3 miles further N. A depth of 119m was reported to lie 12.5 miles NNW of this shoal head.

A depth of 24m was reported to lie 33 miles NNW of Pulau Kalampunian. A depth of 128m lies 36 miles NNW of this island. A depth of 24m was reported in position 8°13'N, 116°36'E, approximately 71 miles N of Pulau Kalampunian.

Pulau Kalampunian (7°03'N., 116°45'E.), lying about 1 mile N of Tanjong Sempang Mangayau, is a small sandstone island which rises to a height of 23m from a flat composed of detached reefs. A drying reef extends about 0.5 mile SE from the island. A 7.8m coral patch lies 0.6 mile NW of the island. A light is shown from a 15m high red stone column with white bands situated on the island.

A safe channel, about 0.2 mile wide, lies between the island and Tanjong Sempang Mangayau. This channel has a least fairway depth of 11m and the reefs along the sides are visible.

A magnetic anomaly was observed between positions 10 miles W and 33 miles NNW of Pulau Kalampunian.