

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

SECTOR 5 —CHART INFORMATION

SECTOR 5

WEST COAST OF AUSTRALIA—NORTH WEST CAPE TO CAPE LEEUWIN

Plan.—This sector describes the W coast of Australia from North West Cape to Cape Leeuwin. The sector includes the Ports of Cape Cuvier, Shark Bay, Carnarvon, Geraldton, Fremantle, and Bunbury. The descriptive sequence is from N to S.

General Remarks

5.1 The coast of Australia from North West Cape, 755 miles SSE to Cape Leeuwin, is generally low, indented by a few bays and rivers, and backed in places by mangrove swamps through which water flows at high tides. In other places there are cliffs which front the coast backed by hills and rise to elevations of 244m. Near Bunbury, in the S part of this sector, there are mountains with heights to 515m about 18 miles inland and rise from an apparent level range. There are few good anchorages along this coast.

Winds—Weather.—The winds on the W coast of Australia, between North West Cape and Cape Leeuwin, are generally from the S, usually between SSW and SSE. During the summer, the winds are almost constant from this quarter, but in the winter, their regularity is interrupted by occasional winds between N and W, which at times blow with considerable violence and are accompanied by heavy rains and misty weather.

In most seasons, the frequency of gales increases from N to S along the coast S of Shark Bay (25° 35'S., 113° 32'E.). A more rapid increase is to be found from N to S over the ocean in the area S of 30° S in the winter and S of 35° S in the summer.

The gales associated with tropical revolving storms are important because of their violence rather than their frequency. Gale force winds are most commonly experienced in squalls, and the more violent of these are usually associated with thunderstorms.

The severity of the gales of Cape Leeuwin, and the rapidity with which they succeed one another during the winter months, are well-known. The barometer always foretells these gales and generally begins to fall a day or two before they commence. A S current, and the rising of the water above the normal sea level, are also signs of an approaching NW gale.

Through most of the year, the driest region is a wide coastal belt from near North West Cape N to Broome.

Rainfall generally increases to the S from North West Cape; in winter there is a rapid increase to the S from Shark Bay to Cape Leeuwin. In general, rain becomes more frequent with increasing distance from the shore, though this is less noticeable S of 30° S, where the amount and frequency of rainfall increases with increasing latitude.

South of North West Cape, as the rainfall increases, its character also changes. At Cape Leeuwin, the rain is spread over a longer period, from May to October, with the rain less intense, although more frequent.

At Perth, most of the rain falls in heavy showers at night. Thunderstorms occur about twice a month, during the passage of cold fronts in the wet season.

Fog is rare. In coastal waters its frequency is usually nil or less than 2 percent. Mist or haze is more common, with visibilities of less than 5 miles reported 40 percent of the time in the area around North West Cape in January and February.

Radiation fog, which occasionally forms towards dawn near the coast, clears quickly after sunrise.

Tides—Currents.—Between North West Cape and Cape Leeuwin, the tides are generally influenced by the winds, varying as much as 0.6m with offshore and inshore winds, with the former reducing the water level. The rise and fall varies from 0.6 to 1.5m. The higher sea level is attained in June.

There are known seasonal changes in sea level in this sector. These changes are the most noticeable where the tidal range is small. Seasonal changes can usually be seen where they exceed the range of the tide.

The currents of this sector show considerable variability, largely due to the variable wind conditions which prevail over most of the area for the greater part of the year. Caution is necessary because they may be modified or even reversed by the prevailing wind.

At distances of more than 60 miles from the coast, the predominant direction of the current is NE to E in the winter and N in the summer. Closer inshore, though there is no continuous countercurrent, clockwise turning branches of the N or NE currents in the offing set E towards the coast or S along the coast. The S set is more continuous in the winter than in the summer, especially between 28° S and Cape Leeuwin.

The mean rate of the current in the waters covered in this sector is less than 0.5 knot, but the S inshore current reaches a rate of 0.5 to 1 knot between 30° S and 32° S.

South of 30° S, there is an onshore current more often than not. This current mainly sets between NE and SE, sometimes at a rate of 1 to 2 knots, although rates in excess of 2 knots have been reported.

Between Cape Leeuwin and Cape Naturaliste, a N set at a rate of 1 knot has been experienced. In January and February, a strong E current setting towards land has been reported in the offing between Cape Leeuwin and Fremantle. A current of considerable velocity has also been experienced year round setting towards the land in the vicinity of Cape Leeuwin. A confused sea has been experienced just outside the 200m curve, with smoother water both seaward and inshore.

On detached reefs, the tidal currents usually set towards the reef from all sides during the flood tide and away from the reef during the ebb tide. The currents are particularly noticeable in the channels through the reef, where the rates may be considerable. A strong onshore current is usually experienced before the onset of NW or W gales. The possibility of onshore sets throughout the year should be kept in mind.

Caution.—Between November and June, extensive lobster fishing takes place on the continental shelf between 24° S and 34° S. When passage permits, vessels are requested to transit the area in depths greater than 200m. It has been reported that the lobster fishing can be a hazard to navigation as the buoys are numerous and unlit; the buoy lines are long and there are generally no gaps between the lines.

North West Cape to Shark Bay

5.2 From North West Cape to False Island Point, about 9 miles SW, the coast is fronted by a coastal reef extending 0.5 to 1 mile offshore; the sea breaks heavily on this reef.

Vlaming Head (21° 48'S., 114° 06'E.), 3.5 miles WSW of North West Cape, is the N extremity of a conspicuous ridge of hills that extend about 50 miles SSW; it is rocky, of a rugged outline, and from 61 to 305m high. The slopes are vegetated with coarse grass and bushes. A conspicuous unused lighthouse, 12m high and made of gray concrete, stands on Vlaming Head.

Helby Bank (21° 48'S., 114° 01'E.), with a least depth of 14.9m, lies 4.75 miles W of Vlaming Head; the sea has been seen to break on this bank with a heavy W swell. A 4.4m shoal lies about 0.9 mile offshore, about 2.75 miles WSW of Vlaming Head. There is a 10.6m patch 3.75 miles W of Vlaming Head. The sea breaks over both these shoals occasionally.

False Island Point (21° 51'S., 114° 01'E.), 5.5 miles SSW of Vlaming Head, appears as an island when seen from NE or SW.

From False Island Point to Point Cloates, 55 miles SSW, a barrier reef fronts the coast; the reef lies between 1 and 3 miles offshore and should not be approached within 1 mile. Depths of 183m lie from 3 to 10 miles off this stretch of coast.

Point Cloates (22° 43'S., 113° 40'E.), which is sandy, rises to Cloates Hill, 41m high. A disused lighthouse, 14m high, stands on the summit of Cloates Hill. Point Cloates Light is shown from a white hut about 0.5 mile S of the disused lighthouse.

Wealjugoo Hill (22° 33'S., 113° 43'E.) rises to a height of 142m about 10.5 miles NNE of Point Cloates; it is located at the S end of a ridge extending S from Vlaming Head.

5.3 Norwegian Bay (22° 37'S., 113° 39'E.) affords anchorage for vessels with local knowledge. The bay lies 7.5 miles NNW of Cloates Point. Range beacons, in line bearing 117°, lead to the anchorage; there is a least depth of 5.5m on the range and a depth of 4m close S. It was reported (1985) that the range beacons were difficult to identify and in bad repair.

Frazer Islet (22° 39'S., 113° 38'E.), a sandy islet, lies just within the barrier reef, 5 miles NNW of Cloates Point. Radar returns from the islet have been reported up to 12 miles. A stranded wreck and the remains of a derelict framework tower are located on the islet.

Black Rock, a pinnacle rock 2m high, on which the sea always breaks, lies 4 miles SSW of Cloates Point Light.

Point Maud (23° 07'S., 113° 46'E.) is the S entrance point of a slight bay that extends 24 miles S from Cloates Point.

Entrance Hill, 85m high, lies 5.5 miles E of Cloates Point; other conspicuous hills on the range extending S to Point Maud are Camp Hill, 51m high, 6.5 miles SE of Cloates Point, and

Whaleback Hill, 70m high, 6 miles farther SE. Airey Hill, 68m high, lies 7 miles NE of Point Maud.

The barrier reef follows the curve of the coast from Cloates Point S to Point Maud and lies from 3 to 4 miles offshore. Passing vessels should not approach the barrier reef within a distance of 1 mile.

From Point Maud the coast trends SSW 29 miles to **Cape Farquhar** (23° 38'S., 113° 37'E.), which is low and sandy with a bare patch of sand. Yalobra Hill, 71m high, about 5 miles S of Point Maud, has a conspicuous sand patch on its seaward side. There is a conspicuous white sandhill at Alison Point, 12 miles NE of Cape Farquhar. Bulbarli Point is located 6 miles NE of the cape.

The barrier reef lies about 1.5 miles off the coast between Point Maud and Cape Farquhar. North Reef, with a depth of less than 1.8m, and on which the sea occasionally breaks, lies 2 miles N of Bulbarli Point.

The coast from Cape Farquhar to Red Bluff, 28 miles SSW, is low and sandy. About 10 miles N of Red Bluff, there are some red cliffs fronted by rock, the land being level.

Red Bluff (24° 02'S., 113° 25'E.) is level, rocky, and of a dark reddish color, rising abruptly from the sea to a height of about 91m.

Cape Cuvier (24° 13'S., 113° 24'E.), 12 miles S of Red Bluff, is 58m high, with light reddish cliffs, and is readily identified when seen from the N. A large dark colored storage shed stands on the cape and is conspicuous. Radar returns from Cape Cuvier and Red Bluff have been reported up to ranges of 21 and 22 miles, respectively.

Reefs, on which the seas break, extend 2 miles from the coast, from Cape Cuvier to a position 8.5 miles N. A rock, 3m high, lies on the drying reef which extends 1 mile from the cape.

5.4 Cape Cuvier (24° 13'S., 113° 24'E.) ([World Port Index No. 54565](#)) lies close within the cape. There is a port radio station at the port. The port lies within the port limits of Carnarvon.

Depths—Limitations.—The port consists of a salt-loading berth, with a depth of 15.2m alongside. There is a least depth of 18m in the approach to the wharf. Vessels secure to six mooring buoys and warp themselves into position for loading each hold.

Berthing may be delayed due to strong winds or heavy swell, and vessels may be required to return to anchor before completion of loading if the berth is affected.

Vessels of up to 65,000 dwt and 250m in length, with drafts up to 14.4m, have been accommodated within the port.

Aspect.—A light is shown from the head of the wharf.

Pilotage.—Pilotage is compulsory; there is no night berthing. The pilot embarks about 1 mile N of the wharf and remains on board while the vessel is at the berth. Pilotage should be requested from the Superintendent of Pilotage at the Department of Marine and Harbours, Fremantle 10 days, 7 days, and 4 days prior to arrival.

Regulations.—The vessel's ETA should be sent to the terminal operators 10 days, 7 days, 4 days, 48 hours, 24 hours, and 12 hours in advance. The 48-hour report should include the vessel's estimated draft fore and aft.

The vessel's ETA should also be sent to the harbormaster at Carnarvon 48 hours and 24 hours in advance.

Anchorage.—Anchorage may be taken NNE of the wharf, about 1.5 miles distant, in depths of 28m, good holding ground. It has been reported there are depths of 16m about 0.3 mile offshore, in the vicinity of the anchorage.

Point Quobba (24° 29'S., 113° 24'E.), 16 miles S of Cape Cuvier, is the N entrance point to Shark Bay. Three miles S of Cape Cuvier are some high sand patches. Beagle Hill, 0.5 mile E of Point Quobba, is a conspicuous sharp peak. Point Quobba Light is exhibited from the summit of Beagle Hill.

Shark Bay

5.5 Shark Bay (25° 35'S., 113° 32'E.) extends S for a distance of 130 miles from Quobba Point, and is from 20 to 50 miles wide. It is bound on the E by the mainland and on the W by Bernier Island, Dorre Island and Dirk Hartogs Island, and the peninsula of Edel Land. The S portion of the bay is divided by Peron Peninsula into two arms; the E arm leads through Hopeless Reach to Hamelin Pool and Lharidon Bight at the head. The W arm leads through Denham Sound and Freycinet Reach into Freycinet Estuary. The N portion of the bay has depths of from 18.3 to 37m.

The E shore of Shark Bay, from Quobba Point, trends SSE for a distance of 26 miles to Gascoyne River, and is mostly barren. A prominent sand patch is located 9 miles SE of Quobba Point; Whaleback Hill and South Bejaling Hill are located 1.5 and 5.5 miles, respectively, farther SE. Pelican Hill, 51m high and 6 miles S of South Bejaling Hill, is conspicuous.

Fitzroy Reefs (24° 33'S., 113° 24'E.), two detached dangers on which the sea always breaks, lie between 1.75 and 3.75 miles S of Beagle Hill; the NW patch has depths of less than 1.8m, while a portion of the SE patch dries.

Darwin Reefs (24° 36'S., 113° 26'E.), with depths of less than 1.8m, lie on the extremity of a ledge extending 4 miles SSW from a point 4 miles SE of Beagle Hill; the sea only breaks on them in heavy weather.

Beejaling Shoals (24° 39'S., 113° 28'E.), with depths of 3.7 and 5.5m, lie from 3 to 4 miles WSW of Whaleback Hill; the sea only breaks on them in heavy weather. An 8.8m patch lies 5.5 miles WSW of the same hill.

Blowfish Banks (24° 48'S., 113° 34'E.), with depths of 4 to 8.2m, extend up to 5.5 miles offshore from a point about 5 miles N of Point Whitmore, the N entrance point of the Gascoyne River.

Geographe Channel (24° 40'S., 113° 16'E.), the N entrance into Shark Bay, is 21 miles wide between Point Quobba on the E and Bernier Island on the W, and has depths of 31 to 42m.

Caution.—It has been reported that a strong S current or set towards the land is experienced at times in the approach to Geographe Channel, between Cape Cuvier and Bernier Island; this usually occurs prior to W or NW winds

5.6 Bernier Island (24° 52'S., 113° 08'E.), on the W side of Shark Bay, is the northernmost of the three principal islands forming the W side of the bay. Bernier Island is about 15 miles long N to S and has a height of 37m. The W coast of the island consists of high perpendicular cliffs, with a level outline; the

coast is steep-to, with depths of 50m being found 0.8 mile from the cliffs. Cape Rosnard Light, in a white circular steel housing, is situated on the N end of the island. Koks Islet, about 7.6m high, is located close off the N extremity of Bernier Island.

Dorre Island (25° 08'S., 113° 06'E.) lies about 0.5 mile S of Bernier Island. The island is about 17 miles long N to S and has a height of 46m. Dorre Island has the same aspect as Bernier Island. Observation Hillock rises over Cape St. Cricq, the S extremity, and is conspicuous. A light, shown from a white hut, is situated on Observation Hillock.

Uranie Bank (25° 10'S., 113° 10'E.), of sand and rock, with depths of 1.8 to 4.8m, lies off the E side of Dorre Island. The S extremity of the bank extends about 11 miles E of Cape St. Cricq.

Naturaliste Channel (25° 22'S., 113° 00'E.), the W entrance into Shark Bay, between Dorre and Dirk Gartog Island, is 14 miles wide. Dampier Reef, with a reported depth of 3.6m and on which the sea breaks in heavy weather, lies with its E extremity about 5 miles S of Cape St. Cricq; there are strong overfalls over this danger with the westgoing tidal current, and it should be given a wide berth. There are depths of 3.1 to 9.6m up to 9 miles ENE through S of Dampier Reef.

5.7 Carnarvon (24° 53'S., 113° 39'E.) ([World Port Index No. 54560](#)) lies about 23 miles within the N entrance of Shark Bay, on the E shore within the Gascoyne River.

Depths—Limitations.—Babbage Island, in the mouth of the river, has a jetty which extends 1,500m WSW and has a berth on the N side 110m in length that will accommodate a vessel 107m in length, in depths of 5m. The port is closed to commercial shipping and is now used only by fishing vessels and small craft.

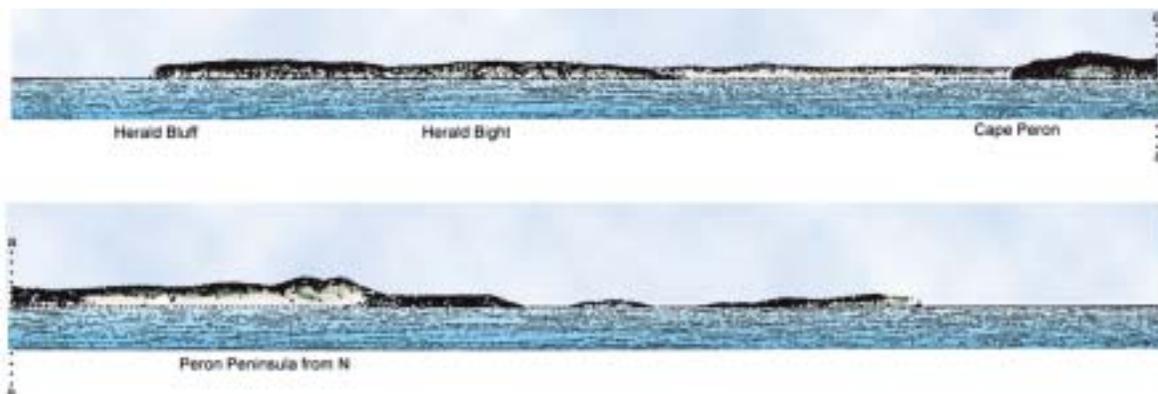
Aspect.—A group of tanks stands on the N end of Babbage Island and a light is exhibited from the NW end of the island. An aeronautical radiobeacon and an aeronautical light are situated on the mainland, about 1.25 miles E of the root of the jetty. A conspicuous dish aerial is situated 4 miles E of Babbage Island Jetty. Radio masts, each with an elevation of 124m and each marked by a red fixed light, stand 5 miles ESE of Babbage Island Jetty. There is a Coast Radio Station at Carnarvon.

Pilotage.—Pilotage is compulsory. The pilot boards 1 mile W of the jetty on Babbage Island. The vessel's ETA should be sent 7 days, 48 hours, and 24 hours in advance.

Anchorage.—Anchorage may be taken, in 6.4m, sand bottom, 0.5 mile W of the jetty head. Vessels with deeper draft must anchor in Gascoyne Road, some distance offshore.

Directions.—A vessel approaching Carnarvon from the N, by Geographe Channel, should give the E shore a berth of at least 8 miles to avoid the reefs and shoals off that shore; Babbage Island Light must be kept bearing less than 130° to avoid the occasional set toward the shore.

Vessels bound for Gascoyne Road or Carnarvon from the S, having passed through Naturaliste Channel, may pass on either side of Dampier Reef, steer to clear the shoals NE, E, and SE of that reef, and keep Cape St. Cricq bearing more than 260° until **Quoin Bluff North** (25° 03'S., 113° 06'E.) bears less than 320° to avoid Uranie Bank, then steer for Gascoyne Road, allowing for the effects of the tidal current.



Cape Peron bearing 178° distant 9.5 miles

In approaching the jetty from either N or S, head for a position 4 miles W of Babbage Island Light; then steer for the jetty, keeping the light on Babbage Island open N of the light on the head of the jetty.

5.8 The E coast of Shark Bay from **Mangrove Point** (24° 54'S., 113° 38'E.), close S of Carnarvon, to Grey Point, 13 miles S, is low. From Grey Point to Greenough Point, 10 miles SE, there are low shores, thickly covered with mangroves and intersected by many salt water creeks; Denham Hummock, 18m high, is the central of three hummocks dominating Greenough Point.

Gascoyne Flats (25° 00'S., 113° 38'E.), which dry in patches, extend up to 4 miles from the coast between Mangrove Point and Greenough Point. Elbow Shoal, with a depth of 4.9m, lies 9 miles SW of Mangrove Point and 6 miles offshore.

The E shore of Shark Bay, from Greenough Point to the Wooramel River, about 42 miles SSE, is low, intersected by creeks, and lined with mangroves, through which the tide flows at a considerable distance inland in some places. A range of low sandhills extends along the greater portion of this coast; the country inland, being low and flat, is in some part subject to flooding.

From Greenough Point to Long Point, 14 miles SSE, the coast is fronted by islets lying close offshore. From Long Point to the Wooramel River, the coast is fronted by a drying bank, with shoal water extending up to 7 miles offshore.

Hopeless Reach (25° 40'S., 113° 42'E.), in the SE arm of Shark Bay, lies SE of Cape Peron Peninsula. There are depths in the reach of 12.8 to 16.5m, sand and shell, in the fairway between the coastal banks on either side.

A fish research area is situated about 4 miles NE of Cape Peron.

Herald Bight (25° 34'S., 113° 33'E.) lies close SE of Cape Peron. Herald Bluff, at the SE corner of the bight, is 39m high. A submerged ledge, with depths of less than 1.8m, extends 5 miles N from Herald Bluff.

Anchorage can be obtained in Herald Bight, in depths of 8m, W of the ledge described above. Anchorage can also be obtained N of Herald Bight, in a depth of 12.8m, 3.75 miles ESE of Cape Peron; and in a depth of 16m, 5 miles NE of the same cape.

There are a number of islands and dangers in the bay S of Hopeless Reach which may best be seen on the chart.

Faure Island (25° 51'S., 113° 53'E.) lies 6 miles E of the E extremity of Peron Peninsula; its central summit is 38m high. A narrow spit, with a least depth of 1.2m, extends 11 miles NNW from the island.

Faure Flat, on which Faure Island lies, extends almost across the width of the SE part of Shark Bay, and has depths less than 1.8m over a large portion of it; this flat extends S and connects Faure Island with Petit Point, the N extremity of the peninsula which separates Hamelin Pool and Lharidon Bight.

Disappointment Reach (25° 45'S., 113° 55'E.), with a least depth of 9.1m in the fairway, is the passage on the E side of Faure Island and forms the approach to Hamelin Pool. Herald Loop, with a least depth of 3.7m, leads SSE from Disappointment Reach to Hamelin Pool, which has regular depths of 7.3 to 10.1m.

Herald Gut (25° 47'S., 113° 45'E.), on the W side of Faure Island, lies at the N end of a narrow channel which leads S to Lharidon Bight; the bight has depths from 9.1 to 11m.

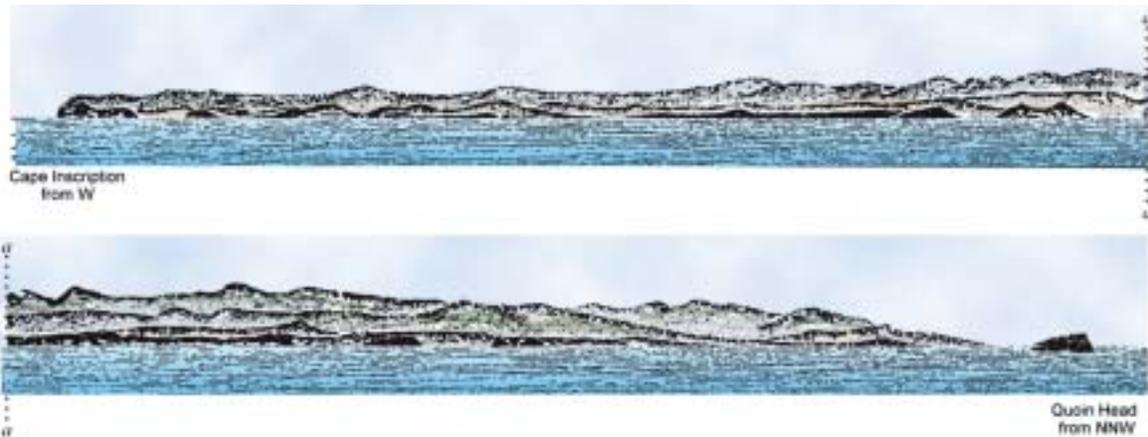
The channels which lead to Hamelin Pool and Lharidon Bight are narrow and difficult to transit; only those vessels with local knowledge should attempt passage.

Dirk Hartog Island—North Extr emity

5.9 Dirk Hartog Island (25° 51'S., 113° 07'E.), which forms the SW side of Shark Bay is about 43 miles in length N to S and has a height of 185m. Cape Inscription, the N extremity of the island, is a remarkable jagged headland, 36m high. On the W side of the island, heavy breakers extend for about 1 mile from the coast between Cape Inscription and a point about 4 miles SSW, but the remainder of the coast appears to be steep-to. Quoin Head, on the W coast about 20 miles S of Cape Inscription, is a conspicuous, bold point.

Herald Heights (25° 57'S., 113° 06'E.), the highest peaks on the W coast, attain a height of 185m; the cliffs between them and Cape Inscription vary from 30 to 90m in height. Surf Point, about 10 miles SE of Herald Heights, has a conspicuous sand hill, 107m high, 0.75 mile N of it.

Cape Ransonnet (26° 10'S., 113° 13'E.), the S extremity of Dirk Hartog Island, is a bare wedge-shaped, sandstone point,



Dirk Hartog Island—North extremity—View in two parts

with two bare rocks, 2m high, close off it; there are shoal depths between the ledges extending from Surf Point and the extremity of Cape Ransonnet.

Steep Point (26° 09'S., 113° 09'E.), the NW extremity of Edsel Land, is a bold cliffy projection, 35m high, which lies 2 miles SW of Surf Point. Edsel Land, S of Dirk Hartogs Island, forms the W coast of Freycinet Reach and Freycinet Estuary.

South Passage, leading from seaward to Denham Sound and Shark Bay, is about 1.5 miles wide between Steep Point and Surf Point. The entrance to the passage is obstructed by Outer Bar, which has a low water depth of 3.8 to 5.5m. The passage should not be attempted without local knowledge, and then only by small craft.

Denham Sound (25° 41'S., 113° 15'E.), the outer part of the SW part of Shark Bay, is entered between Cape Levillain, the NE extremity of Dirk Hartog Island, and Cape Peron, the N extremity of Peron Peninsula, 26 miles E.

Peron Peninsula (25° 53'S., 113° 35'E.), which forms the E coast of Denham Sound, is about 45 miles in length N to S and 12 miles in breadth at the center. A light is exhibited from Cape Peron, the N extremity of Peron Peninsula. A rock, awash, was reported (1975) to lie 9 miles SW of Cape Peron.

Cape Peron Flats (25° 25'S., 113° 31'E.), with irregular depths of less than 9.1m, extend about 12 miles N from the cape; the shallowest part, with a depth of only 0.3m, lies about 2 miles N of the cape.

Caution.—Shoaling has been reported (1994) over this bank

5.10 Cape Lesueur (25° 44'S., 113° 23'E.), on the W side of the peninsula 14 miles SSW of Cape Peron, is a bright sandy bluff; Peron Hills, 43m high, are within.

From Cape Lesueur, the coast trends SSE 13 miles to Lagoon Point, which is 26m high, then S for 11 miles to Eagle Bluff, the SW extremity of Peron Peninsula.

From Eagle Bluff, a bold sandstone cliff, 42m high, the remaining portion of the W coast of Peron Peninsula trends SE 10 miles to **Goulet Bluff** (26° 13'S., 113° 40'E.), 27m high, on the W side and near the center of Taillefer Isthmus.

The W side of Denham Sound is bound by the E side of Dirk Hartog Island. The sound has general depths of 14.6 to 18.3m

as far as Herald Bay. A few isolated patches of 7.3 to 9.1m, which may best be seen on the chart, lie in or near the fairway.

Turtle Bay (25° 29'S., 112° 58'E.), entered between Inscription Point and Cape Levillain, 3 miles ESE, provides good anchorage, in 15m, about 0.75 mile offshore. The anchorage is protected from all winds from ESE through WSW, but should be avoided during the period of NW gales which occur from May to October.

From Cape Levillain, the E coast of Dirk Hartog Island trends S 24 miles to Quoin Bluff South. The coast consists of red cliffs, from 6.1 to 18.3m high, with occasional sandy beaches and is bordered by a reef. Quoin Bluff South is a bold projection, 27m high, that appears as a wedge-shaped island when seen from N.

Levillain Shoal (25° 31'S., 113° 01'E.), with a least depth of 4m and having some rocky heads with depths of less than 1.8m, on which the sea breaks at times, extends 3.5 miles from a position about 1 mile E of Cape Levillain.

Herald Bay (25° 53'S., 113° 09'E.), on the N side of Quoin Bluff South, provides anchorage, in a depth of 7.3m, sand and shells, about 1 mile NNW of the bluff. Depths of 4.9m and 5.8m lie 0.75 mile NW and 1.5 miles NNE, respectively, from the anchorage.

Notch Point (25° 57'S., 113° 08'E.) lies 3.5 miles SSE of Quoin Bluff South. There are depths of less than 5.5m for a distance of 3.5 miles NNE of Notch Point, terminating in a spit with a depth of 3.6m, which lies 2 miles E of the N side of Quoin Bluff South. A patch, with a depth of 0.9m, lies about 2 miles SE of Notch Point.

Dirk Hartog Homestead (26° 00'S., 113° 09'E.) is situated on a point 4 miles SSE of Notch Point.

Anchorage may be taken, in a depth of 7.3m, about 3.25 miles SE of the homestead; anchorage can also be taken in the same depth, about 1.5 miles NNE of the homestead. Care is necessary when anchoring here as the coastal bank is steep-to.

5.11 Cape Bellefin (26° 01'S., 113° 16'E.) lies in the S part of Denham Sound, 8 miles SE of Notch Point, and is the N extremity of Bellefin Prong, a narrow tongue of land, 62m high. Bellefin Prong forms the E side of Blind Strait.

Blind Strait (26° 07'S., 113° 13'E.), with depths of 7.3 to 9.1m, leads SSW from Denham Sound to South Passage, previously described in [paragraph 5.9](#). North Sand, consisting of sand and streaks of dark seaweed, has depths of 1.2 to 1.8m and lies about 4 miles SSW of Cape Bellefin. Inner Bar has a least depth of 3.4m, coarse shells and sand. South Sand, consisting of sand and streaks of dark seaweed, has depths of 0.3 to 1.8m, and lies about 1 mile offshore on the outer edge of a flat fronting the coast of Dirk Hartog Island for a distance of 4 miles NNE of Cape Ransonnet. East Sand, of white sand, extends 1.5 miles from Bellefin Prong; it has depths of from 0.6 to 1.8m and forms the E side of the N part of Blind Strait. The strait leads between the shoal water fronting the W side of Bellefin Prong and East Sand on the E and Edel Land Island to the S.

Cape Heirisson (26° 01'S., 113° 20'E.), the N extremity of Heirisson Prong, is located 3.5 miles E of Cape Bellefin.

Bellefin Flats (25° 58'S., 113° 17'E.), with a least depth of 0.3m, extends about 5 miles NNW from Cape Bellefin, joining **Heirisson Flats** (25° 57'S., 113° 18'E.), which has depths of less than 3.7m and some drying patches on them. Together, Bellefin Flats and Heirisson Flats extend N to a position 5 miles E of Quoin Bluff South. The channel between these spits and the coastal bank extending from Notch Point forms the N approach to Blind Strait.

Bar Flats, which occupy most of the area between Cape Lesueur and Heirisson Flats, have a least depth of 0.9m and so encumber Freycinet Reach, the channel leading from Denham Sound into Freycinet Estuary, as to render navigation difficult for other than light draft vessels. The flats are reported to be subject to considerable change.

Denham Channel (25° 57'S., 113° 12'E.) is a narrow passage, about 125m, wide between Heirisson and Bar Flats. A cut dredged to a depth of 9.8m in 1979, which extends for nearly 1 mile SE from the light beacon marking the NW extremity of Heirisson Flat, gives access to Denham Channel. The cut and channel are marked by lighted beacons and unlit beacons.

A pile lighted beacon, 3 miles NNE of Cape Heirisson, marks the NE side of the S entrance to Denham Channel.

5.12 Useless Loop (26° 07'S., 113° 24'E.) ([World Port Index No. 54555](#)), situated on the E side of Heirisson Prong, 7 miles SSE of Cape Heirisson, is the site of a salt works.

The jetty to the salt works E of Slope Island (Topper Island) is approached through Naturaliste Channel and Denham Channel, which lead to an anchorage off the jetty.

Useless Loop lies within the port limits of Carnarvon. There is a coast radio station at Useless Loop.

Depths—Limitations.—A dolphin-type jetty is laid out in a N-S direction, 0.2 mile E of Slope Island. The jetty is 190m long between the dolphins and has a depth of 10m alongside. The berth will accommodate vessels up to 183m in length, with a maximum beam of 25m and a maximum draft of 9.75m. A pipeline, 2.5 miles in length, extends N from Useless Loop to Slope Island.

Aspect.—A conspicuous water tower stands about 3 miles S of the jetty.

Pilotage.—Pilotage is compulsory for the approaches to the jetty; the pilot boards 1 mile N of Denham Channel Light. Vessels should send their ETA to the terminal operators 72

hours, 48 hours, and 24 hours in advance, with any amendments being sent as soon as possible. Vessels must arrive in a ballasted condition permitting optimum ship handling capabilities, or the vessel may be unable to berth.

Directions.—Vessels proceeding to Useless Loop enter Shark Bay by Naturaliste Channel. When Cape Inscription Light bears 218° distant about 3.5 miles, steer course 128°. When Cape Inscription Light bears 287° distant about 10 miles, alter course to 166° for the lighted beacon marking the W end of Denham Channel. Then follow the marked channel, steering to pass about 1 mile off the lighted beacon marking the E end of the channel until the lighted beacon bears 345°, distant 2.5 miles. Then to steer to a position about 0.5 mile off the jetty at Slope Island.

Caution.—Strong S winds can sometimes cause abnormal low tides and may require a vessel to leave the berth prior to the completion of loading.

5.13 Henri Freycinet Harbor (Freycinet Estuary) (26° 25'S., 113° 43'E.) is the continuation of Freycinet Reach, and from Goulet Bluff extends 23 miles S to Disappointment Loop, the S extremity of Shark Bay. There appears to be a regular depth of water in the harbor, varying from 7.3 to 14.6m, but the approach through Freycinet Reach, as previously described, is difficult.

Caution.—Vessels are warned to proceed with caution because uncharted dangers may exist in the seaward approaches to the three entrance channels to Shark Bay.

Tidal currents enter Shark Bay by Geographe and Naturaliste Channels, on the flood tide, meeting near Uranie Bank; the maximum rate at spring tides is about 1.25 knots.

Shark Bay to Champion Bay

5.14 The coast from Steep Point to Zuytdorp Point, 17 miles SSE, is high and precipitous, but it has not been examined. Epineux Bay (False Entrance) lies 3 miles N of Zuytdorp Point; Dulverton Bay lies immediately N of that point.

Epineux Bay (False Entrance) (26° 20'S., 113° 17'E.) is a shallow inlet about 12 miles S of South Passage. As both openings take a SE direction, Epineux Bay is liable to be mistaken for South Passage when approaching from the S, but the light on Steep Point should identify South Passage.

The coast between Zuytdorp Point and the mouth of the Murchison River, about 90 miles SE, consists of a range of rocky cliffs 91 to 122m high for the first 50 miles and 183 to 244m high farther S. Zuytdorp Point was reported to be prominent on radar. The land at the cliff top is generally level and the coast is uniform, making it difficult to identify any particular part.

Mount Dorrigo (26° 26'S., 113° 20'E.), 35m high and 3 miles S of Zuytdorp Point, is conspicuous and **Womerangee Hill** (26° 54'S., 113° 47'E.), 286m high, and 40 miles SE of the same point, is prominent. This coast appears to be steep-to, with depths of 40m up to 1 mile offshore.

Gantheaume Bay (27° 40'S., 114° 10'E.), off the mouth of the Murchison River, is an exposed bight, with rocky and sandy shores backed by hills bearing stunted vegetation.

Meanarra Hill, 203m high, stands 3 miles E of the river entrance and is prominent.

The Murchison River has a bar across the mouth, protected from the sea by a reef, which generally breaks heavily. There appears to be no passage even for a boat, except at high water, but in fine weather there is a convenient landing place under the shelter of the reef.

Meanarra Hill (27° 42'S., 114° 13'E.), 203m high, stands 3 miles E of the river entrance and is prominent.

Red Bluff (27° 44'S., 114° 09'E.), a short distance S of the Murchison River entrance, forms the N extremity of a range of reddish cliffs, about 61m high, which extend 7 miles SSW to Bluff Point. These cliffs are succeeded by a sandy shore with occasional rocky points and bays trending nearly S, 20 miles to Shoal Point. There is a dark bluff about 8 miles N of Shoal Point, and nearly midway between these are some remarkable sandhills of considerable elevation.

Shoal Point (28° 07'S., 114° 10'E.) is a low sandy projection, fronted with several rocks, awash, to a distance of 0.35 mile. A light is exhibited from a structure situated on a hill 3.5 miles NNE of the point; a racon is located at the light. A depth of 11.5m lies 7 miles SW of Shoal Point; the edge of the charted 36.5m line, about 6 miles farther SW, is marked by tide rips.

From Shoal Point the low sandy shore trends SE about 5.5 miles to Hillock Point, the N point of Port Gregory, then 4 miles to the Hutt River entrance.

Hutt Lagoon extends from within and abreast of Shoal Point to Port Gregory about 8.5 miles distant; 0.5 mile SE of Shoal Point, the sea washes over the low sandy beach into the lagoon with heavy W gales. On the E side of Hutt Lagoon, there is a range of grassy hills attaining a height of 128m.

5.15 Port Gregory (28° 11'S., 114° 15'E.) ([World Port Index No. 54550](#)) is formed between the coast SE of Hillock Point and a ledge of rocks running parallel with this coast at an average distance of 0.2 mile. The main ledge of rocks which forms the seaward side of the port extends 2 miles ESE from Hillock Point and is about 1m high. Two detached ledges, Flat Rock and North Rock, each about 1m high, lie about 0.15 and 0.5 mile NW, respectively, of the N extremity of the main ledge.

Hero Passage, the best entrance to Port Gregory, is about 150m wide, with a least depth of 4.2m in the fairway between Flat Rock and North Rock. A shallow bank, over which the sea breaks in a heavy swell, lies nearly 0.5 mile NW of North Rock.

The position of the port can be identified by a bare white sand patch located about 0.5 mile N of Hillock Point, which is visible from a distance of 12 miles and Scrubby Hillock, close N of the same point.

Anchorage for vessels with a draft of less than 3.6m can be obtained about 0.1 mile ESE of Hillock Point, in 5.5m, rock and sand. This anchorage, between the shore and the shoal bank extending E from the ledge, does not afford sufficient room for swinging at a single anchor, so a vessel must moor with one anchor on the shoal bank and the other on the beach.

A current generally sets N through the passage, and at times may attain a rate of 3 knots. During the winter, with a succession of NW gales, the current runs in the opposite direction.

In the offing the current generally sets NW, with a maximum rate of 2 knots through most of the year; when N and NW winds prevail it runs in the opposite direction, though not so strong, but the tendency in both cases is to set a vessel toward the land.

The **Hutt River** (28° 13'S., 114° 18'E.) flows into the sea 4 miles SE of Hillock Point; its mouth is generally closed by a sand bar. About 3 miles NE of the river mouth there are two remarkable conical peaks, Mount Victoria and Mount Albert; the latter has an elevation of 162m and is distinguished by a conspicuous cone.

From the Hutt River, a rocky coast trends SE for a distance of 14 miles to the Bowes River. The first 10 miles has a steep, grassy ridge rising from the beach and varies from 116 to 133m in height; this coast is fringed by a line of reefs extending up to 0.25 mile offshore. About 4 miles NNW of the entrance to Bowes River are two prominent bare sand patches.

The mouth of the Bowes River is usually closed by a sand bar. The town of Northampton stands about 10 miles inland; it is connected to Geraldton by road and a railway.

For about 20 miles SE of the entrance to the Bowes River, the hills within the coast are table-topped, with perpendicular sides, varying from 183 to 244m in height.

Archdeacon Ledge (28° 14'S., 114° 16'E.), with a least depth of 4m, lies 3 miles SSE of Port Gregory and 1 mile offshore.

From the Oakajee River, 12 miles SSE of the Bowes River, to the Buller River, there are several ledges awash; the Buller River is usually barred. There are several rocky ledges in Drummond Cove, close S of the Buller River.

Woolawar Gully (28° 30'S., 114° 32'E.), a narrow gap with a stream flowing through it, is 6.5 miles SE of the entrance to Bowes River. Kings Table Hill (Table Hill), 241m high and conspicuous, stands 5 miles ENE of Woolawar Gully, and there is a grassy hill, 95m high, about 2 miles SE of the same gully.

Yellow Gully, the Oakajee River, and the Buller River lie 2.5, 6, and 9.5 miles, SSE respectively, of Woolawar Gully.

Wokatherra Hill (28° 39'S., 114° 39'E.), 210m high, with White Peak, 173m high, close SW of it, lies 17.5 miles SSE of Bowes River entrance. Moresby Range has a flat-topped peak at its S extremity, with a gap between it and Mount Fairfax, which is 185m high, and stands 24 miles SSE of the Bowes River entrance. A conspicuous television mast, 351m high, stands on Moresby Range 2.5 miles SSE of Wokatherra Hill. Wizard Peak, a conspicuous cone 215m high, is situated 7 miles SE of Mount Fairfax. There is comparatively low country between Wizard Peak and Mount Fairfax.

5.16 Sandy Point (28° 41'S., 114° 36'E.), the N entrance point of Champion Bay, is located 2.5 miles S of the entrance to Buller River, with Drummond Cove (Smugglers Cove), a slight indentation in the coast, between them. The coast from Sandy Point extends 5 miles S, then W 1.5 miles to Point Moore, the SW extremity of Champion Bay.

The coastal waters from Port Gregory to Champion Bay are rather steep-to, with few charted dangers.

Champion Bay (28° 44'S., 114° 36'E.) is protected on its S and W sides by Point Moore and the reefs extending from it; Point Moore Reefs lie to the W of Point Moore and Four-

fathom Banks extend from a position 1.75 miles NNW of Point Moore to Sandy Point.

Drying reefs extend up to 0.15 mile off Sandy Point and depths of less than 11m extend up to 1.5 miles offshore abreast this point. The Chapman River, 4 miles NE of Point Moore, is generally closed by a sand bar. A spoil ground lies centered 0.5 mile offshore, about 1 mile SW of the Chapman River.

A conspicuous radio tower, 76m high, stands about 0.5 mile S of the entrance to the river. A light is shown at Point Moore and an aeronautical radiobeacon is situated about 6.5 miles ESE of the point.

Vessels approaching Champion Bay may easily identify the locality by Mount Fairfax and Wizard Peak, which have been described in [paragraph 5.15](#), if the landmarks are not capped with clouds.

Geraldton (28° 47'S., 114° 36'E.)

World Port Index No. 54540

5.17 Geraldton is situated in the SE corner of Chapman Bay and has a harbor which is protected by breakwaters. There is anchorage in Chapman Bay.

The port serves as a tanker terminal and supply platform for offshore rigs, and handles bulk grain, copper ore, talc, general cargo, and livestock for export.

Geraldton Port Authority Home Page

<http://www.gerport.wa.gov.au>

Winds—Weather.—During the summer, prevailing winds are from the SE, and from May to November gales sometime blow with great strength from the NW through N to E. With a falling barometer, accompanied by an unusual rise in the sea level, a NW gale may be expected.

Tides—Cur rents.—The tides at high water springs are 1.1m. The sea level is greatly influenced by the winds. The land breezes, which prevail during the summer months from midnight to about 0900 or 1000, cause the lowest levels; W and NW winds, being more prevalent during the winter months, cause the highest levels. There is an unusual rise of the water before a NW gale, and during the continuance of the gale, the sea level remains from 0.9 to 1.2m above its ordinary level. The sea level is correspondingly lowered during S winds, with a maximum of 0.6m below datum having been recorded.

The currents during the summer months set in a N direction while during the winter months the currents set in a S direction; the ocean swell, however, being generally from the W, has a tendency to set a vessel toward the coast. Swells of up to 6m have been recorded in the seaward entrance to the outer approach channel.

Depths—Limitations.— The approach to Geraldton Harbor is through Champion Bay. The fairway through the reefs, which is indicated by a range and marked by buoys, leads into a dredged entrance channel, which is maintained to a depth of 10.2m in its outer part and 9.6m in its inner part, and then leads between the breakwaters into the harbor basin, which is maintained to a depth of 9.3m.

On the S side of the harbor are berths, with lengths of 99 to 281m. Berth characteristics are given in the accompanying table.

Geraldton—Berth Characteristics		
Berth	Length	Depth
No. 1	99m	8.8m
No. 2	203m	9.4m
No. 3	203m	9.4m
No. 4	281m	9.4m
No. 5	213m	9.4m
No. 6	213m	9.4m

Vessels up to 235m in length and 33m in beam, with drafts up to 8.7m, can be accommodated within the port.

A channel, dredged to a depth of 3.2m and indicated by a range leads from the harbor entrance W along the S side of the W breakwater to a fishing harbor. There is a marina, with depths of 2.4m, located in the SW part of the fishing harbor.

Aspect.—A radio mast 0.5 mile S of the mouth of the Chapman River is conspicuous. Scott Hill (Mount Scott), 40m high and 2 miles E of Point Moore, is prominent on the skyline and a conspicuous rectangular silo, 58m high, stands about 1 mile W of Scott Hill.

Pilotage.—Pilotage is compulsory. Pilots usually embark in the approach about 3 miles NW of Point Moore Light; if weather conditions prevent the pilot boat from reaching this position, the port authority will advise where the pilot will board.

The vessel's ETA is required 48, 24, and 2 hours before arrival. The 48-hour ETA notice should include the vessel's maximum draft fore and aft. There is a Coast Radio Station and a Port Radio Station at Geraldton.

Regulations.—Tankers are berthed during daylight hours only.

Anchorage.—Anchorage may be taken, in 11m, about 2.25 miles NNE of Point Moore Lighthouse, good holding ground.

Eight anchor berths, each with a radius of 0.5 mile and marked S1 and N1 through N7, are situated in the approaches.

Caution.—Swells up to 6m in height have been observed in the approaches to the outer channel; at such times deep laden vessels should not attempt to enter.

During W weather, the sea breaks in depths of 7.3m and less, and vessels are not to proceed inside the pilot boarding grounds without instructions from harbor authorities.

Houtman Abrolhos

5.18 Houtman Abrolhos (28° 39'S., 113° 47'E.) consists of three groups of islets and rocks, surrounded by reefs, extending NNW-SSE about 49 miles, with a breadth of 10 to 13 miles. They lie about 30 miles offshore and are separated from the mainland by Geelvink Channel.

The basis of all these islands, rocks, and reefs is limestone, consisting chiefly of coral and shells; the islets on the E side of Easter and Pelsaert Groups are merely ridges of dead coral and shells, while those on the W side are flat blocks of limestone, about 1.5m high, covered by stunted vegetation.



Geraldton from N

On their E sides, the islets rise steeply from depths of about 45m; on their W sides, the barrier reef is steep-to off Pelsaert Group, but becomes increasingly less steep-to farther N, off Easter Group and Wallabi Group. There are off-lying dangers NW of Easter Group and W of West Wallabi Islet.

Zeewyck Channel and Middle Channel, between the groups, have a generally flat sandy bottom, with depths from 40 to 60m.

The passage between North Islet and Wallabi Group contains many dangers; local knowledge is advised and a sharp look-out is essential.

5.19 Wallabi Group (28° 22'S., 113° 42'E.) lies at the N end of Houtman Abrolhos group; it is comprised of North Island, East Wallabi Islet, West Wallabi Islet, and several islets and rocks, mostly connected by reefs.

North Island is on the E edge of a reef that extends 2.5 miles N and 4.5 miles S. A light is situated on the island.

An oval-shaped bank, with a least depth of 11.4m, lies about 13 miles NW of North Island; heavy breakers have been observed on the shoal during bad weather. An isolated coral patch, with a depth of 16.3m, lies 11 miles NNW of North Island.

East Wallabi Islet and West Wallabi Islet lie 11 miles SE and SSE, respectively, from North Island. The islets lie in the central part of a reef about 8 miles in length N to S and a width of 12 miles. East Wallabi Islet, 15m high, has been reported to give radar returns up to 20 miles.

North East Reef (28° 25'S., 113° 49'E.), awash and which often breaks, lies about 3.75 miles ENE of East Wallabi Islet. Acute Bank, with a depth of 14.3m, lies 2 miles N of North East Reef. Beagle Knoll, with a depth of 12.8m, and Assail Bank, with a depth of 10.6m, lie 5 miles and 7.5 miles NW, respectively, of the reef.

Morning Reef and Noon Reef, about 4 miles ESE and SSE, respectively, from East Wallabi Islet, form the SE extremity of the Wallabi Group and are separated from each other by a clear passage up to 0.5 mile wide, with depths from 35 to 42m. Broken ground extending 0.6 mile SW of the S extremity of Morning Reef constricts the width of the channel to about 0.3 mile.

Morning Reef has several islets on it and the historic wreck of a vessel lies on its S extremity. Noon Reef has numerous islets and rocks on it and is separated from the reefs joining the two Wallabi Islets by two narrow channels which enclose a large triangular reef, the E side of the reef forming the W boundary of a lagoon. Evening Reef, a circular patch of rocks, underwater and awash, which always break, is located 6 miles SSW from East Wallabi Islet and forms the S extremity of the Wallabi Group.

Recruit Bay, protected on the W by East Wallabi Islet, affords anchorage to small vessels with local knowledge, in depths of 22m. The bay is encumbered by numerous coral patches.

5.20 Easter Group (28° 43'S., 113° 47'E.) lies SSE of the Wallabi Group and is separated from that group by Middle Channel, with a least width of 6 miles between Evening Reef and the dangers NW of Easter Group, and general depths from

42 to 60m, sand bottom in the fairway. A reported depth of 23.2m lies 4 miles ESE of Evening Reef.

Rat Island (Rat Islet) (28° 43'S., 113° 47'E.), about 2m high and the largest of the Easter Group, lies nearly in the center of a lagoon which is entered through Good Friday Bay, N of the islet. The reefs which surround Rat Island extend about 3 miles N of the island and about 7 miles in all other directions; the reefs may best be seen on the chart.

Good Friday Bay, including its entrance from the N, is bordered on both sides by reefs. A steep-to 5.5m patch lies 4 miles N of Rat Island.

Good Friday Bay is a secure anchorage, but local knowledge is desirable. The anchorage is in 24 to 27.5m, about 0.35 mile NE of the jetty head on the NE side of Rat Island. There are several patches in the vicinity of the anchorage and scattered throughout the navigable waters between Rat Island and the E side of Easter Group.

Dart Shoal (28° 40'S., 113° 54'E.), with a depth of 7.6m, lies 1 mile E of Easter Group.

Snapper Bank (28° 41'S., 114° 00'E.), with a least depth of 8.2m, coral, is 5.75 miles ESE of Dart Shoal.

5.21 Pelsaert Group (Pelsart Group) (28° 55'S., 113° 55'E.) is separated from the Easter Group by Zeewyck Channel, which is about 4 miles wide in the narrowest part and has depths of 40 to 60m in the fairway. A shoal, with a least depth of 5.4m, lies at the S side of the channel, 10 miles N of Wreck Point Light. Shoal patches, with depths of 3.4 and 6.7m, lie 1 mile and 0.5 mile N of Wreck Point.

The main body of the Pelsaert Group is triangular in shape, and encloses a lagoon which has its opening on the N side. Middle Islet lies in the middle of the lagoon and Square Islet, which is easily identified, lies 2 miles ENE of Middle Islet.

Mangrove Islets (28° 52'S., 113° 59'E.) lie about 2 to 3 miles NE of Square Islet and form the E entrance to the lagoon; they are surrounded by reefs and rocks, awash in places.

Pelsaert Islet forms the greater part of the E side of the lagoon. The islet is a narrow ridge of coral about 6 miles long, and terminates at Wreck Point. Wreck Point Light is exhibited from a white metal column.

The SW and W barrier of Pelsaert Lagoon is formed by a narrow reef which extends about 11.5 miles NW of Wreck Point.

Batavia Road is formed by a slight curve in the SE part of Pelsaert Islet. Temporary anchorage, with local knowledge, may be taken in the road, in depths of 22 to 24m, sheltered from winds between SSE through W to about NE. A coral patch, with a depth of 3.7m, lies 0.75 mile N of Wreck Point.

Hummock Islet (28° 48'S., 114° 03'E.), 9.5 miles NE of Middle Islet, has a small mound 5m high on its SE extremity; a reef, with depths of less than 1.8m, surrounds the islet. A light is exhibited on the islet.

King Reef, with depths of less than 9.1m and on which the sea seldom breaks, lies 2.75 miles SSE of Hummock Islet; other shoal patches, some of which have been previously mentioned, lie to the E in Geelvink Channel.

Geelvink Channel (28° 45'S., 114° 15'E.), between Houtman Abrolhos and the mainland, from Shoal Point to Champion Bay, is about 30 miles wide, with depths of 19 to 48m, over a bottom of sand and shell. Mid Reef lies in the channel 23 miles

W of Point Moore Light; the reef consists of at least two rocks awash. Another submerged rock which breaks is located approximately 2 miles SW of Mid Reef. There are shoal depths of 8.6, 9.1, and 10.1m 4.5 miles NNW, 1.25 miles ENE, and 3 miles WNW, respectively, from Mid Reef. Other shoal patches in this vicinity may be seen on the chart.

Turtle Dove Shoal (29° 21'S., 114° 12'E.) has a least depth of 9.1m. It is composed of coral and sand, and can be seen easily on sunny days with clear water. Breakers, 12m high, have been observed over the shoal, and blind rollers higher than this have been seen on its edge. The sea breaks heavily at times on Turtle Dove Shoal; less water than charted probably exists on this shoal. Clio Bank, with a depth of 25.3m, lies 4 miles NNE of this shoal.

Pelsaert Bank (29° 27'S., 114° 14'E.) has charted depths of from 33 to 55m, coarse sand, coral and shell; it is probable that less depths exist on the bank. The least known depth, 33m, lies 6 miles SSE of the 9.1m patch on Turtle Dove Shoal and a depth of 29.6m lies 15 miles SSE of the 33m depth. Areas of broken ground, rising from a general depth of 49m to a least depth of 32m, lie E of the Pelsaert Bank.

Champion Bay to Fremantle

5.22 The coast from Point Moore trends 5.5 miles SSE to Cape Burney, which is smooth and of moderate height, then 29 miles SE to Leander Point. A conspicuous water tower stands about 3 miles ESE of Point Moore.

From Cape Burney to Leander Point, the coast is formed of sand hills varying from 40 to 92m in height; inland there are several scattered table-topped hills upwards of 244m high. Mount Hill, with an elevation of 182m, stands 15.5 miles N of Leander Point; Mount Horner, a conical peak 241m high; is 13 miles NE of the same point.

From Point Moore to abreast Cape Burney, the shore is fronted by reefs up to 2 miles offshore. The coastal reefs lie between 9 and 15 miles SE of Cape Burney and again from a position 20 miles SE of the cape they continue nearly to Leander Point.

African Reef (28° 58'S., 114° 37'E.) lies between 5 and 7 miles S of Cape Burney. The least depth over the reef is a 2m patch located 4 miles offshore; a patch of greater extent, with a least depth of 2.2m, lies on the reef 1.75 miles offshore. The sea breaks over the reef in moderate to heavy swell.

Between Point Moore and Freshwater Point, 53 miles SSE, the coastal waters have not been fully examined inshore of the 30m curve; uncharted shoals may exist within this area and mariners should not enter it without local knowledge.

North Bank (29° 12'S., 114° 52'E.) lies with its S extremity 2 miles WNW of Leander Point; from this position it extends about 7.5 miles N and has several patches on it with depths of from less than 1.8 to 5.5m. The sea generally breaks on portions of North Bank, especially in a swell.

Irwin Reef extends about 3 miles S from a position 3 miles WSW of Leander Point; the sea usually breaks in places. The reef forms the S side of Main Passage.

Leander Point (29° 17'S., 114° 55'E.), low and rocky, with an elevation of 10m, lies 34 miles SSE of Champion Bay. Reefs, which dry 0.3m with offshore winds, extend 0.3 mile NNW from the point.

5.23 Port Denison (Dongara) (29° 16'S., 114° 55'E.) ([World Port Index No. 54530](#)) is a fishing boat harbor enclosed by breakwaters close NE of Leander Point. There are two small jetties within the harbor. Depths in the harbor range from 5.8m in the entrance, to 2m in the middle. The harbor provides moorings for a cray fishing fleet, with craft up to 25m in length.

The approach to the harbor is made through Main Passage, which is about 1.25 miles wide and lies between the S limit of North Bank and the N extremity of Irwin Reef. There are depths of 11 to 14.6m in the passage, except for an 8.8m patch lying almost in mid-channel about 2.25 miles W of Leander Point. Main Passage is indicated by a range. To enter the harbor vessels pass N of Leander Point and turn onto the range, which leads in a S direction between the breakwaters.

Anchorage may be found NE of the harbor entrance, but it is unsafe in winter or with strong winds from NW or W. Anchorage, in 15.5m, good holding ground, may be found 1.25 miles SW of Leander Point.

Leander Reef (29° 23'S., 114° 50'E.) lies about 9 miles SW of Leander Point and about 7 miles offshore; the sea generally breaks over it. The reef extends S for at least 1.25 miles.

From Leander Point, the coast trends S for 7.5 miles to White Point, a bare sandy projection, then 8 miles S to Cliff Head, 42m high, which has conspicuous dark cliffs. Freshwater Point, 5 miles S of Cliff Head, is a limestone cliff. A light is exhibited from Freshwater Point. Knobby Head, 82m high, is located 3 miles S of Freshwater Point.

Beagle Islets (29° 49'S., 114° 52'E.), about 7.6m high, lie SSW of Knobby Head, about 5 miles offshore. Breakers have been reported about 2 miles NW of the two islets. It was reported that these islets are inhabited by seals and are a nature reserve.

Caution.—From the coast opposite the Beagle Islets to North Head, 22 miles S, numerous limestone reefs, with depths of less than 1m, extend up to 3 miles offshore.

A dangerous wreck lies about 0.8 mile SSW of the islets.

5.24 From Knobby Head (29° 40'S., 114° 58'E.) to Green Head, 24 miles S, the coast recedes a little and is lower. About 6 miles SE of Knobby Head is Woodada Hill (Wudada Hill), 98m high, the N end of a range 12 miles in length with a hill 106m high, near its S extremity. To the S of this range, the hills join those E of Jurien Bay. The coast for about 16 miles N of Green Head is low and cliffy; Green Head is a round grassy-topped hillock, 29m high. Snag Islet, 6m high, lies 8 miles N of Green Head and close offshore. Drummond Rock, above water, lies 0.5 mile S of Snag Islet. A range exhibited at Leeman indicates a passage between Snag Islet and Drummond Rock.

Anchorage.—Green Head Anchorage, which is well-protected, is situated about 1 mile N of Green Head. The approach is indicated by two ranges and has a least depth of 3.1m. There is a jetty, with a refueling dolphin at the anchorage, which is used by fishing vessels.

Fisherman Islets (30° 08'S., 114° 57'E.), 10m high, lie nearly 3 miles offshore, 4 miles S of Green Head. The tops of the islets are covered with grass and scrub.

There is a remarkable sandy patch midway between Green Head and Sandy Point, 7 miles S. The coast for about 1.5 miles

S of Sandy Point consists of bare ridges, terminating in a slight sandy projection. There are three indentations between Sandy Point and North Head, 3 miles to the S.

North Head (30° 14'S., 115° 00'E.), 21m high, is the N entrance to Jurien Bay. Middle Head, 15.5m high, is in the center of the bay, 3 miles SE of North Head. The hills S of Middle Head become much lower and the shore trends gradually round to Island Point, 4.5m high, the S extremity of the bay.

Mount Peron (30° 07'S., 115° 09'E.), 275m high, and Mount Lesueur, 309m high, are two conspicuous table-topped mountains located 10 miles NE and ENE, respectively, of North Head. Mount Benia, 14 miles E of North Head, is 257m high.

The coast from Leander Point to Jurien Bay is encumbered by rocks and reefs extending to 7 miles offshore.

Jurien Bay (30° 17'S., 115° 01'E.) is entered between North Head and Island Point, 5.5 miles SSE; it is protected on its S and SW sides by several islets and reefs which extend up to 4 miles offshore. North Tail is the N extremity of a rocky ledge, awash, which lies 2.5 miles SSW of North Head. A shoal, which breaks in a heavy swell, lies about 1 mile NE of North Tail.

Seaward Ledge, which dries, lies 2 miles S of North Tail; submerged rocks, with a least depth of 2.7m, on which the sea breaks at uncertain intervals, extend 1.5 miles S of Seaward Ledge. Favorite Island, 14m high, is located 2.25 miles NNW of Island Point, about 2 miles offshore.

Boullanger Island (Long Island) (30° 19'S., 115° 00'E.), 7m high, lies 0.75 mile W of Island Point. The island is covered with grass and scrub. An islet, 10m high, lies close off the N extremity.

Whitlock Island, 9m high at its S end, lies 0.25 mile SW of Boullanger Island, to which it is joined at low water. Tern Islet, 3.7m high, lies 0.3 mile N of Whitlock Island; foul ground, with some drying patches, extends from the islet NNE to Favorite Island.

Anchorage can be obtained in Jurien Bay, in a depth of 9m, about 0.75 mile NE of Favorite Island, sand and rock. A rock has been reported to lie about 0.5 mile NNE of the same island. Anchorage within the bar is available to vessels of not more than 3.6m draft, about 1.25 miles ESE of Favorite Island, in depths of 11m. Lights, in range bearing 111.5°, are situated on shore about 0.7 mile SSE of Middle Head; the approach to the anchorages should be made on this range.

Jurien Boat Harbor is situated about 0.75 mile S of the front leading light and is protected by breakwaters. Range lights situated in the SW corner of the harbor lead over the sand bar which fronts the harbor entrance.

5.25 From Jurien Bay, the coast trends SSE about 42 miles to Lancelin Islet, which is 16m high, and covered with grass; the islet lies about 0.5 mile offshore.

There are several conspicuous hills on this coast, the most prominent being Molah Hill, 64m high, located 5.5 miles SSE of Island Point. About 1 mile further SSE there is a bare sand hill, with a dome-shaped top, 57m high. Cowalla Peak (North Namban Flat), a conical hill, 241m high, lies about 13 miles ESE of Island Point.

Thirsty Point (30° 31'S., 115° 03'E.) is a low scrubby point located 12 miles S of Island Point. The land E of Thirsty Point rises suddenly, and about 2 miles inland, SE of the point, there is a long range of sandhills, with two remarkable dark bushy summits, North and South Hummocks, 120m and 121m high, respectively, near the S end. From near South Hummock, the ridges continue SSE for about 11 miles, covered with grass and shrub, the highest point, 157m high, being 5.5 miles SSE of South Hummock. A conspicuous sand patch lies 1 mile NNE of North Hummock.

A prominent sandy point is located about 20 miles S of Thirsty Point; from this sandy point an extensive tract of bare sand stretches along the coast for about 6 miles, extending inland about 3 miles to a sand ridge that attains a height of 133m. There are several conspicuous sand patches in this locality.

The coastal waters S of Jurien Bay are encumbered with many rocks and reefs; the shoals lie up to 3 miles offshore, from Island Point to Lancelin Islet.

Escape Island (30° 20'S., 115° 00'E.), 12m high, lies 2 miles WSW of Island Point, and is covered with grass and scrub. A light, exhibited from a 24m high metal framework tower, is situated near the center of the island.

Caution.—A local magnetic anomaly was observed in a position 8 miles WNW of Escape Island.

5.26 Cervantes Islets (30° 32'S., 115° 02'E.) lie close off Thirsty Point; reefs extend 1.5 miles W from them. Several above-water rocks and ledges, which dry, extend 5 miles NW from Thirsty Point; the outer rock lies 5 miles offshore.

Ronsard Bay is 1.75 miles NNE of Thirsty Point; boats may land there in moderate weather. A range is shown from the head of the bay which has a least depth of 3m up to about 1.25 miles from the front range light.

A rock, 2m high, lies 4 miles S of Cervantes Islets, about 2 miles offshore.

Green Islets (30° 41'S., 115° 06'E.), two in number, lie 10 miles SSE of Cervantes Islets and 1.75 miles offshore. Red Rock, 3m high, lies 1.5 miles SE of Green Islets; from it a chain of reefs extend SSE to a position 0.5 mile from Wedge Islet. Flat Rock, 4.25 miles NNW of Wedge Islet and 0.5 mile offshore, is 12m high.

Wedge Islet (30° 50'S., 115° 11'E.), 21m high, is perpendicular on its S side, but slopes gradually N; in fine weather, landing can be made on the NE side of the islet. The inshore waters between Wedge Islet and the approaches to Fremantle have been incompletely surveyed and caution should be exercised accordingly. A tower, from which fixed red obstruction lights are occasionally exhibited, stands on the mainland, about 2.5 miles ESE of Wedge Island.

Numerous beacons and towers, some of which carry red obstruction lights, stand up to 2 miles inshore within an area which extends 8 miles SSE from Wedge Island.

Lancelin Islet (31° 00'S., 115° 19'E.), 17m high and covered with grass, lies 13 miles SSE of Wedge Islet, 0.5 mile offshore; on its E side there is a small sandy beach which affords safe landing.

Lancelin Islet anchorage range lights are located on the mainland about 1 mile NE of the islet. These lights are in

range, bearing 075.5°. The anchorage should only be used by vessels with local knowledge. There are three small jetties at Lancelin, about 0.5 mile SE of Lancelin Islet.

There is a fairly constant S or SE current, from about 30° S, past Cape Leeuwin. Strong variable currents are reported from 20 to 27 miles offshore between Cervantes Islets and Lancelin Islet. These currents average from 2 to 3 knots and set in various directions, but the SE direction predominates.

5.27 From Lancelin Islet to Trigg Islet, 57 miles SSE, rocks and reefs extend to 5 miles offshore. Sand dunes, 15 to 30m high, extend 3 miles SSE along the coast from a point 1 mile N of Lancelin Islet. Within the coast, 1.5 miles SE of Lancelin Islet, the high ridges are covered with grass and scrub, attaining a height of 138m, 5 miles inland.

Edward Islet, 5.5 high, lies 1.5 miles S of Lancelin Islet and about 0.15 mile offshore. Numerous rocky ledges, most of them awash, lie between Edward Islet and Ledge Point, 5.5 miles SSE.

Ledge Point (31° 07'S., 115° 22'E.) lies about 7 miles SE of Lancelin Islet; a hill with a height of 59m, is located 3 miles SE of the point. Range lights are shown from a position about 0.5 mile SE of Ledge Point and lead through a gap in the coastal reef to an anchorage. Conspicuous water towers, 37m and 42m in height, stand 0.3 mile ESE and 0.65 mile NE, respectively, of Ledge Point.

A dangerous wreck lies about 10 miles WSW of Ledge Point.

Cape Leschenault (31° 17'S., 115° 27'E.), 11 miles SSE of Ledge Point, appears as a dark bluff when seen from S; about 5 miles within the cape the hills reach a height of 65m. A sand patch, 44m high, stands 3 miles SSE of the cape and there is a conspicuous sand patch, 71m high, 3.75 miles farther SSE; the Moore River flows out between these two patches. A range marking a passage through the reef is situated on the cape; a light is shown from a position on the coast about 3 miles SSE of the cape.

Wreck Point (31° 30'S., 115° 35'E.) is located 10 miles S of the Moore River; a range marks the passage which leads to the marina. From Wreck Point the coast trends SSE 24 miles to Trigg Islet; the intervening coast is backed by sand hills which attain a height of 61m. Some conspicuous tanks stand about 4.5 miles SE of Wreck Point.

Leschenault Reef (31° 17'S., 115° 20'E.) lies from 6 to 7 miles W of Cape Leschenault; the sea only breaks over the reef in a heavy swell. The coastal reefs, with depths of less than 1.8m, extend nearly 3 miles off the mouth of the Moore River, about 6 miles SE of Leschenault Reef.

Direction Bank, with depths of from 19 to 37m, is located with its least depth about 17 miles WSW of Wreck Point. A depth of 24m lies at the SE extremity of the bank.

Eglinton Rocks (31° 38'S., 115° 39'E.), 2m high, lie close offshore 9 miles S of Wreck Point; reefs, with depths of less than 1.8m, extend up to 3 miles offshore between Wreck Point and Eglinton Rocks. A conspicuous stranded wreck lies about 1 mile N of Eglinton Rocks.

Wanneru Beach, lying 3.25 miles SE of Eglinton Rocks, has a small craft harbor. The approach from the SW is indicated by a range.

5.28 Mullaloo Point (31° 48'S., 115° 43'E.) lies about 7.75 miles S of Wanneru Beach. Little Islet, 2.4m high, lies 1 mile off Mullaloo Point. Reefs with depths of less than 1.8m, extend up to 2.5 miles W, in the vicinity of Mullaloo Point, and continue S at the same distance offshore, for about 4 miles to Trigg Islet.

A small craft harbor, with depths of 1.7m and protected by breakwaters, is situated about 3 miles N of Mullaloo Point; the approaches from NW and SW are indicated by ranges. A small craft harbor lies about 1 mile SSE of Mullaloo Point.

A submarine cable extends in a W direction from a point on the shore about 0.5 mile NE of Mullaloo Point; a prohibited anchorage area, extending 0.3 mile each side of the cable, is indicated by beacons on the shore.

Trigg Islet (31° 53'S., 115° 44'E.) is 5m in height and connected with the mainland at low water. A conspicuous building is situated near the shore, about 1 mile S of Trigg Islet. A prominent water tower, 82m high, stands on a hill 1.25 miles E of Trigg Islet and a radio mast, 178m high, stands 2.5 miles NE of the water tower. Centaur Reef lies 2 miles WNW of Trigg Islet and is marked by a lighted beacon.

From Trigg Islet to Cape Leeuwin, about 151 miles SSW, the coast trends in a general S direction to Cape Bouvard, then SSW to Cape Naturaliste, then S to Cape Leeuwin. The principal port, Fremantle, is situated about 11 miles S of Trigg Islet. The port is protected on the W by Rottnest Island, Garden Island, and the reefs and rocks which lie between the two islands.

From Trigg Islet to Cape Peron, about 24 miles SSW, the coast is indented by Gage Roads and Cockburn Sound, which recede about 18 miles in a S direction from their entrance between Rottnest Island on the W and the mainland on the E.

Reabold Hill, 84m high, is located about 4 miles SSE of Trigg Islet. The coast extending about 10 miles S from Trigg Islet to the entrance of Fremantle Inner Harbor is generally low and sandy.

Approaches to Fremantle

5.29 Rottnest Island (32° 00'S., 115° 30'E.) is located about 10 miles WNW of Fremantle and is a good mark when making for that port. Rottnest Island has been reported to be a good radar target when approaching from the NW. The island is 5.5 miles in length E to W and 2.5 miles at its widest point N to S. The island is surrounded with rocks and shoals extending for a distance of up to 1.5 miles. Rottnest Island Light is shown from a white masonry tower situated in about the middle of the island. Two prominent windmills are situated about 0.75 mile ENE of the light structure. An aeronautical radiobeacon is situated at the E side of the island.

Cape Vlaming (32° 02'S., 115° 27'E.), the W extremity of Rottnest Island, is a narrow cliffy point 37m high. Submerged rocks, the outer rock having depths of less than 1.8m, extend up to 0.5 mile WSW of the cape; depths of 18.3m lie 0.1 mile beyond the rock. A light is shown from Cape Vlaming.

Caution.—Unexploded ordnance lies in an area, with a radius of 0.25 mile, centered about 17.5 and 20 miles NW of Cape Vlaming, in depths of 100m and 120m, respectively.

The NW coast of Rottnest Island from Cape Vlaming to North Point, 4 miles ENE, is skirted by Horse Shoe Reefs and

other rocky ledges, many of which dry, extending up to 0.85 mile offshore. Horse Shoe Reefs consist of several rocks, with depths of 2.1 to 3.7m. About 2 miles offshore, N of Horse Shoe Reefs, there are several patches with depths of 16 to 18m; during heavy N and W gales there is a confused and dangerous sea on these patches.

North Point Reef, with a depth of 13.8m, lies 1 mile NW of North Point; the sea breaks on the reef in bad weather.

Bathurst Point (31° 59'S., 115° 32'E.), 1.5 miles E of North Point, is the NE extremity of the island. A light is shown from a gray stone structure on the point. Duck Rock, 5m high, stands about 0.1 mile N of Bathurst Point; a lighted beacon is situated on the rock.

Two small craft jetties are situated in Thomson Bay, about 0.5 mile S of Bathurst Point; ranges mark the approaches to the jetties.

Caution.—Unexploded ordnance lies in an area, with a radius of 0.25 mile, centered about 1.5 miles N of Bathurst Point, in a depth of about 15m.

Roe Reef, with a least depth of 4m, lies 1 mile N of Bathurst Point. A rock, with a depth of 6.1m, lies 0.15 mile SW of Roe Reef. Between Roe Reef and the N side of Rottneest Island, there are a number of detached shoals with depths of less than 11m. Depths of 17.7 to 18.9m lie up to 1.5 miles N of Roe Reef.



Courtesy of Grant and Tracey's Lighthouse Page

Bathurst Point Light



Courtesy of Sophia M. McHarney and Malcom Macdonald's Lighthouses of Australia Page

Bathurst Point Light

Phillip Point (32° 00'S., 115° 34'E.), the E extremity of Rottneest Island, is 16m high and is formed of scrubby hillocks. A light exhibited from a red beacon is situated on Phillip Rock, about 0.25 mile NNW of Phillip Point.

Kingston Reefs, consisting of numerous rocks, a sandbank awash, and several drying rocks, lie on a bank with depths of less than 5.5m, which extends about 1.25 miles offshore between Bathurst and Phillip Points. Kingston Spit, with depths of 9.1m, extends 2 miles ENE from the coast between Bathurst and Phillip Points; a 4.6m patch lies 1.25 miles NE of Phillip Point. Kingston Reefs is marked by a lighted beacon standing about 0.5 mile N of Phillip Point; Kingston Spit is indicated by a lighted buoy moored about 1.5 miles ENE of Bathurst Point.

Parker Point (32° 02'S., 115° 32'E.), the S extremity of Rottneest Island, is a round bare head, 24m high, connected with the shore by a low narrow ledge of rock; when seen from the E or W, it appears detached. From the point to Cape Vlaming, 4 miles W, the coast of the island is fronted by a reef and by numerous rocks extending to the 10m curve, which lies up to 0.75 mile offshore in places. The outermost danger off Parker Point is a 5.5m rocky patch about 0.45 mile SSW of the point.

Strickland Bay and Salmon Bay lie between Cape Vlaming and Parker Point; both are foul and rocky.

Mount Herschell, 34m high, and Tree Hill, 38m high, with a conspicuous tower on it, stand 2 miles and 0.5 mile N, respectively, of Parker Point.

Dyer Islet (Direction Islet) (32° 01'S., 115° 33'E.), 14m high, is located in Porpoise Bay, 1.25 miles ENE of Parker Point.

Porpoise Bay is entered between Parker Point and Bickley Point, 1.5 miles NE.

Duffield Ridge (32° 02'S., 115° 28'E.), a narrow ledge of rock, on which the sea breaks in heavy gales, has a least depth of 16.4m and lies 1 mile SE of Cape Vlaming and 0.75 mile offshore.

5.30 Pilot Reef (32° 00'S., 115° 35'E.), a rocky ledge with a least depth of 3m, lies about 1 mile ESE of Phillip Point, on the coastal bank which extends about 6 miles E of Rottneest Island. Other dangers lie S of Pilot Reef on the coastal bank.

Middle Bank, with a least depth of 3.6m, lies 0.75 mile S of Pilot Reef. Jackson Rock, with a least depth of 3m, lies 0.4 mile S of Middle Bank, on the N side of South Passage. Nineteen Feet Rock, which has two heads with a depth of 5.5m, lies on the N side of South Passage, 0.75 mile ENE of Jackson Rock.

From Middle Bank and the dangers in the vicinity, a reef, through which there are a few passages, extends SSE to the N end of Garden Island.

Champion Rock (32° 02'S., 115° 36'E.), with a depth of less than 1.8m, lies near the center of a shoal with depths of less than 5.5m, about 0.65 mile SSE of Jackson Rock. There are some patches, with depths of from 1 to 5.5m, between Champion Rock and the N end of Straggler Reefs.

South Passage (32° 02'S., 115° 35'E.) leads into Gage Road S of Rottneest Island, and is 0.5 mile wide between Nineteen Feet Rock and the shallow patches extending NW from Champion Rock. The passage is indicated by a range, which has a least depth of 7.9m on the line, although the swell in this area limits

the passage to non-commercial vessels with a maximum draft of 5m. This passage is not recommended.

Straggler Reefs (32° 04'S., 115° 38'E.), with numerous rocky ledges, some of which dry, extend, with depths of less than 5.5m, from 1 to 3 miles SSW from Champion Rock.

Straggler Rocks (32° 04'S., 115° 38'E.), consisting of several pointed rocks, the largest and highest of which is 12m high, are located 5.5 miles SE of Phillip Point.

Straggler Channel lies between the SE end of Straggler Reefs and the W end of Success Bank; it should only be used with local knowledge.

The Roarers (32° 06'S., 115° 39'E.), rocks with depths of less than 1.8m, lie 2.5 miles S of Straggler Rocks; there are many dangers on the reefs which extend S from Straggler Rocks to the N end of Garden Island, that may best be seen on the chart.

Carnac Island (32° 07'S., 115° 40'E.), 17m high, is located 2 miles N of Beacon Head, the NE extremity of Garden Island. Submerged reefs and foul ground extend 0.5 mile W, almost connecting it with the rocky ridge which extends N to The Roarers.

5.31 Garden Island (32° 12'S., 115° 41'E.), which forms the W side of Cockburn Sound, is about 5.5 miles in length N to S; its W side, which is described here, is bordered with reefs extending 0.2 to 0.4 mile from the shore. Entrance Point is the NW extremity of the island.

The hills on the W side of the island rise abruptly from the beach to a height of 56m, and are covered with grass and bushes.

A light is shown from the W central portion of the island.

Collie Head, the S extremity of Garden Island, is 19m high. Foul ground extends about 0.45 mile SE from Collie Head. Collie Ledge, with a depth of less than 2m, lies about 0.2 mile SE of Collie Head and is marked by a beacon.

Southern Flats (32° 15'S., 115° 42'E.) extend about 1.75 miles ESE of Collie Head and S to John Point, the N extremity of Cape Peron on the mainland. The flats are steep-to on their NE and SE sides; with a heavy W or SW swell, the sea breaks heavily on the flats.

A causeway has been constructed across Southern Flats from a position on the coast 0.75 mile SE of John Point, N to Garden Island. There are two gaps in the causeway, about 0.3 mile and 1.5 miles from its S end, each spanned by a bridge; the vertical clearance under the N bridge is 12m.

Minstrel Channel, about 40m in width and about 2.9m deep in 1989, has been dredged across Southern Flats under the N bridge of the causeway. The channel is subject to silting and to heavy swells in bad weather. In fine weather it can be used by small vessels with local knowledge, however, the water level is erratic and governed by weather conditions.

An area within 0.1 mile on either side of the causeway and an area on the N and E sides of Garden Island have been declared Naval Waters.

Caution.—Five Fathom Bank extends S from a position about 4 miles SE of **Parker Point** (32° 02'S., 115° 32'E.), for a distance of 16 miles. The bank lies 2.5 miles to the W of Garden Island and the reefs which extend N from Garden Island. There are a number of patches on the bank with depths less than 1m.

Seaward Reef, with a depth of less than 1.8m, lies on the bank about 4 miles NW of Entrance Point; isolated shoals, with depths of from 4.6 to 8.5m, continue 2 miles S to Casuarina Shoal.

Casuarina Shoal, with a least depth of 3m, and Hawley Shoal, with a least depth of 4.9m, are located on the bank about 3 miles W and 3 miles WSW, respectively, of Entrance Point.

Between Hawley Shoal and Coventry Reef, 10 miles S, the patches on the bank are more scattered and have depths of 5.5 to 8.5m, except 3 miles N of Coventry Reef, where there is a rock with a depth of 4.6m. Other shallow areas may exist on the ridge and vessels should avoid crossing it.

Coventry Reef (32° 20'S., 115° 38'E.) consists of a small group of rocks, which dries about 0.9m, over which the sea always breaks; it is surrounded by submerged rocks extending 0.1 to 0.2 mile from it.

The extent of Five Fathom Bank S of Coventry Reef has not been defined.

There is a passage across Five Fathom Bank, with the obelisk S of Woodman Point Light in line with Entrance Rocks, off Entrance Point which leads between Casuarina and Hawley Shoals, through a least charted depth of 8.5m.

5.32 Gage Roads (32° 02'S., 115° 41'E.), in the approach to Fremantle, are protected from W and S by Rottnest Island and the reefs and shoals between it and Garden Island, as well as Success Bank, but the roads are open to N and NW winds.

The coastal waters NE of Gage Roads are bordered by a bank, with depths of less than 11m, extending up to 1.5 miles offshore.

North Rock (31° 58'S., 115° 44'E.), with a depth of 7.4m, lies 1.25 miles offshore, 5.5 miles N of the North Mole; a 6.1m patch lies 0.5 mile N of North Rock. A group of shoals, with a least depth of 5.8m, and another group, with a least depth of 8.2m, lie 3 miles NNW and 2.5 miles WNW, respectively, from North Rock.

Hall Bank (32° 02'S., 115° 43'E.), a rocky patch with a least depth of 5.4m, lies 1.75 miles NW of the North Mole and is marked on its W side by a lighted beacon.

The approach to Gage Roads from sea is open and readily accessible for ships in all weathers; the entrance between Rottnest Island and the off-lying dangers previously described in [paragraph 5.29](#) is about 8 miles wide.

Beagle Rocks (32° 04'S., 115° 44'E.), which are foul and on which submerged wrecks lie, are located about 0.4 mile SW of the South Mole; these rocks are marked by a lighted beacon. An area of foul ground, best seen on the chart, exists in the vicinity of Beagle Rocks.

Minden Reefs (32° 03'S., 115° 43'E.), with a least depth of 3.6m, lie 0.5 mile S of the head of North Mole.

Other dangers lie in the approaches, but are in general clear of the entrance channels and best seen on the chart.

Fremantle (32° 03'S., 115° 44'E.)

[World Port Index No. 54520](#)

5.33 Fremantle, the chief commercial port in W Australia, is situated on the S side of the entrance to Swan River, on a low

sandy flat connecting Arthur Head with the mainland. Perth, the capital of Western Australia, lies 11 miles upriver.

The port of Fremantle consists of an outer harbor and an inner harbor.

The outer harbor is comprised of Gage Roads, Owens Anchorage, and Cockburn Sound. Gage Roads is accessible to most classes of vessels; the other two are only available for vessels which can negotiate the dredged channels across Success Bank and Parmelia Bank.

The port has facilities for handling bulk cargo, general cargo, petroleum products, containers, and ro-ro traffic.

Rous Head Harbor, a commercial boat harbor and industrial park, is entered from the S side of tNorth Mole to the Inner Harbor. The depth in the S part of the harbor is maintained to 6m.

Fremantle Port Authority Home Page

<http://www.freport.wa.gov.au>

Wind—Weather

The prevailing winds are from the SW. The barometer is a good indicator of the weather as a general rule, rising with S winds and falling with N winds. Gales generally commence from N and rapidly shift W with a falling barometer.

Tides—Currents

The water level in Fremantle is erratic, being almost entirely governed by the weather. Before and after W gales, a high level of about 1.2m is maintained for possibly 6 days. In the summer months, especially during E weather, a very low level may be experienced for the same period. Tides normally range from 0.5 to 0.9m.

It was reported that after a period of heavy rains, the Swan River produced a strong freshet in Fremantle Harbor. This current set obliquely onto Berth No. 8 and Berth No. 9 at about 5 knots, then parallel with the jetties, then strongly out of the harbor entrance.

In the approach channel from Gage Roads, the current ran out of the harbor at about 4 or 5 knots, setting to the SW when clear of South Mole.

In Gage Roads, the N current runs for about 10 hours while the S current runs for about 14 hours; the rate is usually small, but may be as much as 2 knots in unsettled weather in the winter months.

Depths—Limitations

Inner Harbor.—The Inner Harbor of Fremantle is an artificial harbor constructed within the estuary of the Swan River. The entrance to Inner Harbor is a short channel having a depth of 13m, and is protected by two rubble moles extending WSW from the mainland.

The fully-protected Inner Harbor is safe for ships all year. The berths at Victoria Quay are lettered A through J from the entrance; the total length is 1,643m. The North Quay has number designations from 1 through 12, beginning from the W.

This quay extends 2,216m in length; the ro-ro facilities are situated at Berth No. 11 and Berth No. 12.

The maintained depth of the channel is 13.2m. Vessels normally berth starboard side-to. Available depths (2000) are given in the accompanying table.

Available depths at Fremantle	
Berth	Depth
No. 1	10.8m
No. 2	10.9m
No. 4	12.7m
No. 5	12.7m
No. 6	12.7m
No. 7	12.7m
No. 8	12.7m
No. 9	12.9m
No. 10	10.7m
No. 11	10.8m
No. 12	10.8m
A	9.0m
B	9.0m
C	9.0m
D	10.8m
E	10.8m
F	10.9m
G	10.9m
H	10.7m

The Swan River, at the head of Inner Harbor, is spanned by three bridges with a minimum clearance under the lowest of 7.6m; a channel, marked by lighted beacons and piles, extends about 11 miles up the river to Perth and is used by small craft.

A fishing harbor, enclosed by breakwaters, lies along the shore close S of Inner Harbor. There are general depths within the harbor from 2.4 to 4.6m.

Success Yacht Harbor has been constructed immediately S of Fishing Boat Harbor. The harbor is enclosed by a curving breakwater and has depths from 2.3 to 3.7m. Yacht marker buoys are moored within 3 miles of the entrance.

Owen Anchorage.—From Fremantle, the shore to Owen Anchorage is low and sandy, trending S to Woodman Point which is only a few feet above sea level. A light is shown from a stone tower standing on a hill about 1 mile E of Woodman Point.

Owen Anchorage, W of the coast between Catherine Point, 2 miles S of Fremantle, and Woodman Point, lies between Success Bank on the N and Parmelia Bank on the S.

Success Bank, with depths of less than 5m, extends 5.5 miles W from Catherine Point. The bank is composed of sand and weeds, with rocky patches; depths on the bank vary from time to time. Rowboat Rock, 4m high, and Mewstone, 16m high, lie on the SW side of Success Bank.

There are a number of rocks and shoal areas in Owen Anchorage which may best be seen on the chart.

There is a special berth, Woodman Point Jetty, provided for loading and unloading explosives, and is used exclusively for this purpose. The jetty, which lies about 1 mile NE of Woodman Point, has a length of 61m, with depths of 5.2 to 7.9m alongside.

Owen Anchorage is approached by a channel dredged through Success Bank, which has a dredged depth of 14.7m and a bottom width of 152m. The channel is marked by lighted buoys and beacons and indicated by a range.

The quarantine station jetty is situated close within the N side of Woodman Point.

Cockburn Sound.—The sound is formed between Garden Island, on the W, and the mainland and is sheltered from the N by Parmelia Bank.

Challenger Passage leading lights, located 0.75 mile N of Garden Island, lead between the dangers lying between Carnac Island and Garden Island into Cockburn Sound. These lights, in line bearing 109° 30', lead through Challenger Passage passing between two lighted buoys moored close N of Challenger Rock; then between Flat Ledge and Stag Rocks and over Pinnacle Rocks, in a least depth of 5.2m

Parmelia Bank separates Owen Anchorage from Cockburn Sound and extends W from Woodman Point to beyond Carnac Island. There are depths of 1.5 to 4.9m on the bank. There are shoal patches 1.5 and 2.25 miles WNW of Woodman Point which break heavily in a W swell.

Parmelia Bank Channel, 152m wide and dredged to 14.7m, leads S from Owen Anchorage, across Parmelia Bank to Cockburn Sound. It is in line with, and forms a continuation of, Success Bank Channel. The channel is marked by lighted buoys and beacons and is indicated by a range.

East shore of Cockburn Sound.—From Woodman Point, a ridge extends about 5 miles S to James Point, parallel with the coast and 1.5 miles from it; there are shallow patches with depths of 2.1 to 4.9m on the ridge. There are depths of 10m in Jervoise Bay, close S of Woodman Point, and about 2 miles NNE of James Point.

There are several passages over the submerged ridge, but vessels with a draft of more than 3m, without local knowledge, should use only Woodman Channel, Calista Channel, or Stirling Channel.

Woodman Channel, leading to Jervoise Bay, is entered between two lighted beacons near the edge of the charted 10m curve, about 2.25 miles SW of Woodman Point Light; the beacons are about 125m apart. A directional sector light, for night use only, is exhibited from Woodman Point Light. A breakwater extends in a curve about 0.4 mile NW from a position on the shore 1.5 miles SE of Woodman Point.

Each jetty on the E side of the sound has been designed and constructed for a specific purpose. Alumina Refinery Jetty is situated about 2 miles NNE of James Point; the jetty has a berth 334m in length with a depth of 11.6m alongside. Approach to the berth is by Stirling Channel and Calista Channel, which are dredged to a depth of 11.6m and indicated by ranges.



Courtesy of Fremantle Port Authority

Fremantle—Inner Harbor—Victoria Quay

The BHP Steelwork Jetties, situated about 0.75 mile NE of James Point, are approached by Stirling Channel. The North Jetty has a berth 195m in length, with a depth of 11m alongside. The South Jetty has a berth 268m in length, with a depth of 12.2m alongside.

Kwinana Oil Refining Jetty is situated about 0.5 mile S of James Point. Three berths are situated parallel with the shore; mooring dolphins extend the length of the jetty at either end. Each jetty has an along-side depth of 13.7m, and can accommodate vessels up to 262m long; however; the channel depth restricts the allowable deep draft to 12.6m. The approach to the jetty is indicated by a range.

A restricted area, shown on the chart, is situated in the vicinity of the Kwinana Oil Refinery Jetty; unauthorized vessels are not permitted within the area.

The Bulk Cargo Jetty is situated about 0.5 mile S of the Kwinana Oil Refinery Jetty and has a jetty head ,480m in length,dredged to a depth of 13.4m alongside.

Kwinana Grain Jetty is situated about 1 mile SW of the Bulk Cargo Jetty. The jetty head is 291m in length dredged to a depth of 16.8m alongside.

Mangles Bay (32° 16'S., 115° 43'E.), in the S part of Cockburn Sound, is protected from W and N by Cape Peron and Southern Flats extending from Cape Peron to Garden Island.

There are facilities for naval vessels W of Colpoys Point, in the N part of **Careening Bay** (32° 14'S., 115° 42'E.), on the SE side of Garden Island.

There are two piers at Colpoys Point; the E pier has a depth of 11m alongside and the W pier has depths of 9.8m alongside.



Courtesy of Fremantle Port Authority

Fremantle—Inner Harbor—North Quay



Courtesy of Fremantle Port Authority

Fremantle—Inner Harbor—Rous Head

An angled breakwater extends 0.15 mile E and NE from Colpoys Point.

An armament jetty extends 430m from the shore at a point about 0.25 mile S of **Dance Head** ($32^{\circ} 10'S.$, $115^{\circ} 40'E.$); an area S of the jetty is reportedly dredged to 10.5m.

When ships draw 9.2m and over, a clearance of 10 percent of the draft is required in transit of the channels.

Lights, in line bearing 169° , situated in Cockburn Sound, lead through the channels dredged through Success Bank and Parmelia Bank; the channels are marked by lighted beacons



Courtesy of Fremantle Port Authority

Fremantle—Outer Harbor—BHP Steelworks Jetties



Courtesy of Fremantle Port Authority

Fremantle—Outer Harbor—Kwinana Oil Refinery Jetty

and lighted buoys. In addition, the range beacons exhibit lights visible from S, which, in line astern, lead to the tanker anchorage and jetties in the S part of the sound. These channels are dredged to a depth of 14.7m.

Aspects—Landmarks

The coast NNE to SSE of the Inner Harbor is low and sandy, and backed by a ridge of scrubby limestone hillocks in the SE sector.

Fairway Landfall Lighted Buoy, equipped with a racon, is moored about 7.25 miles NW of the entrance to Inner Harbor.

A directional sector light is located about 2.5 miles NE of the north mole.

Conspicuous landmarks within the vicinity of the Inner Harbor include a white obelisk, 71m high, standing on Buckland Hill, about 3 miles NE of the harbor entrance; a large silo situated about 1 mile NE of the root of North Mole; and the signal mast of the Port Authority Building standing about, 0.5 mile E of the head of South Mole.

A war memorial standing on the summit of Church Hill, 62m high, about 1 mile E of the harbor entrance, is also very prominent.



Courtesy of Fremantle Port Authority

Fremantle—Outer Harbor—Bulk Cargo Jetty



Courtesy of Fremantle Port Authority

Fremantle—Outer Harbor—Kwinana Grain Jetty

Other conspicuous landmarks include a group of the windmotors, 66m high, standing about 2.5 miles SSE of the harbor entrance; a white obelisk standing on a ridge with a windmotor close N, about 0.75 mile S of Woodman Light; a chimney, 76m high, standing about 2 miles SE of Woodman Light; Mount Brown, 68m high and the highest point of the coastal ridge, standing about 2.75 miles NNE of James Point; a

group of three chimneys, the tallest being 59m high, standing about 0.5 mile S of the Alumina Refinery Jetty; a number of chimneys in the vicinity of the Kwinana Oil Refinery Jetty and the Bulk Cargo Jetty, which are best seen on the chart; and a silo, 114m high, standing at the root of the Kwinana Grain Jetty. A microwave tower standing about 1.25 miles SE of the head of Mangles Bay is prominent.



Fremantle—East side of Cockburn Sound—Piers in vicinity of James Point—Kwinana Oil Refining Jetty (foreground), South Steelwork Jetty and North Steelwork Jetty (center), and Alumina Refining Jetty (rear)



Courtesy of Lighthouses of Western Australia
Fremantle—North Mole Light



Courtesy of Lighthouses of Western Australia
Fremantle—South Mole Light

Pilotage

Pilotage is compulsory for merchant vessels. Service is available 24 hours a day. There are two boarding grounds, as follows:

1. Vessels up to 11m in draft—2 miles NW of the entrance to the Inner Harbor, in position 32° 02'00"S, 115° 41'30"E
2. Vessels drawing 11m or more —In an area with its center situated about 3 miles NW of the Fairway Landfall Lighted Buoy.

The vessel's ETA, including the request for pilot and details of any dangerous cargo, must be sent 48 and 24 hours prior to arrival at the Fairway Landfall Lighted Buoy and confirmed or amended 2 hours in advance.

Regulations

A vessel carrying explosives or other dangerous cargo shall indicate this fact by radio in its ETA message; the draft should also be included.

All vessels requiring pratique anchor in Gage Roads and remain there until medical quarantine and customs requirements have been satisfied.

A complete set of port regulations is available from the Fremantle Port Authority, Fremantle.

A speed limit of 8 knots is in effect in the Inner Harbor and entrance channel. Vessels should avoid crossing the entrance

channel, but vessels which do so are required to cross by the shortest possible route and obey the 8 knot speed limit.

Signals

The signal station is situated on top of the Port Authority Building and is clearly visible to all ships in the vicinity.

All orders concerning shipping movements and related matters are passed to the ships through the signal station by VHF radio. Vessels not equipped with VHF radio are signaled with Aldis lamps.

Anchorage

In the summer season, October to April, safe and convenient anchorage will be found in Gage Roads, in depths of 14.6 to 16m, fine sand, about 1 mile WSW of the entrance to Inner Harbor. In winter, vessels should anchor about 0.5 mile farther W or NW. Prohibited anchorage areas, shown on the chart, are situated in the deep water channel extending SE from the Fairway Landfall Lighted Buoy and in the vicinity of the entrance to Inner Harbor.

Designated anchorage areas, 300m in radius, are located in Gage Roads E and W of the deep water channel and N and S of the prohibited anchorage area in the vicinity of the entrance to the Inner Harbor.

Anchorage may be taken in the center of Owen Anchorage, in depths of 14m, but there are several shallow patches in the



Courtesy of Lighthouses of Western Australia
Fremantle—Woodman Point Light

anchorage. The SE part of Owen Anchorage, under Woodman Point, is preferable during the summer, when strong breezes prevail from S and W.

The NE part of Owen Anchorage, known as Beagle Anchorage, affords good shelter for small vessels of light draft, in all seasons.

Mangles Bay provides anchorage, in 18m, mud.

Caution.—A submarine pipeline extends from a position on the shore about 2.5 miles NNE of the North Mole in a W direction to Rottneest Island. Several disused submarine cables extend from the same position on the shore, to seaward in a NE direction.

Directions

Gage Roads should be approached by passing N of Rottneest Island, which should be given a berth of 4 miles.

Vessels approaching Gage Roads from the N should steer for the Fairway Landfall Lighted Buoy. Least depths of 11m lie within the white sector of Woodman Point Light (32° 08'S., 115° 46'E.).

From the Fairway Landfall Lighted Buoy, steer for Buoy No. 1, remaining in the white sector of Buckland Hill Direction Light.

Vessels with drafts of 11m or more must embark a pilot at the outer boarding area; they may then proceed through the buoyed channel.

Vessels with drafts of less than 11m may either pass to the E of the buoyed channel and then steer S; or if the channel is clear of a deep draft vessel, they may head directly S from Buoy No. 1 and cut through the buoyed channel.

The approach to Gage Roads through South Passage should only be used with local knowledge. Due to heavy swell, the passage is restricted to vessels with drafts of 5.8m or less. The passage is not recommended. The S coast of Rottneest Island should not be approached nearer than 1 mile.

Fremantle to Bunbury

5.34 From Cape Peron to Cape Bouvard, 25 miles SSW, the coast is indented by Shoalwater Bay, Warnbro Sound, and an unnamed indentation which has a length of about 9 miles N to S.

Shoalwater Bay lies between Cape Peron and Mersey Point, 2.5 miles to the S; drying reefs and foul ground extend up to 1 mile off the shores of this bay.

Warnbro Sound (32° 20'S., 115° 43'E.) is entered between Mersey Point and Becher Point, 4 miles S. It is protected from the W by a chain of islets, reefs, and rocks.

The N shore of the sound is very low, and behind it are extensive swamps, which dry in the summer. The E shore is backed by sand hillocks, about 24m high.

Passage Rock (32° 20'S., 115° 41'E.), 6m high, is located 1.5 miles SSW from Mersey Point; the rock rises abruptly from the middle of a drying ledge. The bay N and S of Passage Rocks is fronted by sand banks, rocks, and drying shoals.

A channel, with a depth of 9.1m, is entered on range lights, which are situated SE of Passage Rock. The channel is narrow and tortuous, and local knowledge is necessary when entering. Port Kennedy, situated in the S part of the sound, offers good anchorage in depths from 12.8 to 16.5m.

Caution.—A fish haven, with a least depth of 14.2m, was reported (1990) to lie about 1.75 miles NNE of Becher Point.

The 10m curve lies about 0.75 mile W of Passage Rock; Coventry Reef is located on Five Fathom Bank about 3 miles W of Passage Rock.

5.35 Coventry Reef (32° 20'S., 115° 38'E.) consists of a small group of rocks, which dries about 0.9m and which always breaks; it is surrounded by submerged rocks extending from 0.1 to 0.2 mile from the reef.

The extent of Five Fathom Bank S of Coventry Reef has not been defined, but it was reported to extend S of the reef.

From Becher Point, the coast trends SE about 3 miles to a high sandy hillock, then SSW about 7 miles to Robert Point, a low sandy projection with a high wooded hill within it. Stake Hill, 46m high, stands 3.5 miles ESE of Becher Point. A conspicuous water tower, from which a light is shown, stands near the summit of a hill, 52m high, about 0.5 mile S of Robert Point; drying ledges extend about 0.3 mile off the point.

Shoals, with depths of 20m, 22m, and 27m, lie about 17 miles W, 18 miles W, and 20 miles WSW, respectively, of Cape Peron. An isolated shoal, with a depth of 27m, lies 16.5 miles WSW of Coventry Reef.

The Murray River, close E of Robert Point, is about 0.5 mile wide at its mouth and is fronted by sand spits extending nearly across it; lights are exhibited on each side of the entrance. The bar is narrow and seldom has depths of more than 1.2 to 1.8m; the depths vary according to the weather, and at times the mouth is closed altogether. Peel Inlet is entered about 2 miles within the mouth of the river and, with Harvey Estuary, extends nearly 14 miles S from the river. Mandurah, a small town connected by road with Fremantle and Bunbury, stands on the E bank of the Murray River, about 0.5 mile within its mouth. There are several small jetties and a marina at Mandurah.

Murray Reefs (32° 23'S., 115° 41'E.), which extends about 6 miles SW from Becher Point, are an extension of the reefs that front Warnbro Sound; the sea occasionally breaks on the S extremity of the reef. An isolated patch, with a depth of 7.6m, lies outside the reef, 5 miles SW of Becher Point. There is a strong set towards these reefs, especially during W gales.

Shoal patches, with depths of 7.6m, lie 5.5 miles NW and SW, respectively, from Robert Point; a 6.7m patch lies 2 miles W of the point.

From Robert Point, a rocky coast with occasional small sandy beaches extends 10 miles SW to **Cape Bouvard** (32° 41'S., 115° 36'E.). A light, 51m high, stands close E of Cape Bouvard.

5.36 The coast from Cape Bouvard trends S for a distance of 37 miles to Casuarina Point; a narrow grassy-topped ridge, with an average height of 52m, extends 25 miles S of the cape; then for 3 or 4 miles the hills are about 21m high, rising gradually S toward Koombana Bay, E of Casuarina Point. At 6 and 16 miles, respectively, S of the cape are two conspicuous sand patches extending from the beach to the summit of the ridge. Within the coastal ridges are Lake Clifton and Lake Preston; farther inland the hills rise to a height of 75 and 108m, about 14 and 20 miles SSE, respectively, of the cape.

Bouvard Reefs (32° 50'S., 115° 35'E.) lie from 4 to 15 miles S of Cape Bouvard, at distances varying from 2 to 3.5 miles offshore; the sea only breaks on these reefs during a heavy swell. It has been reported (1988) that the reefs cannot be picked up on radar.

Casuarina Point (32° 19'S., 115° 38'E.), the W entrance point of Koombana Bay, is composed of sandhills gradually rising to a height of about 40m. A light is exhibited from Casuarina Point. A rock, with a depth of 1.4m, lies about 0.3 mile offshore, about 4 miles NNE of the point. A depth of 11m exists nearly 2 miles N of Casuarina Point Light; there are depths of 11.3m up to 0.75 mile farther NNW.

Caution.—The waters along this coast have been incompletely surveyed.

Naturaliste Reefs (33° 14'S., 115° 02'E.) lie about 31 miles W of Casuarina Point Light and consist of two patches 0.6 mile apart. The NE patch is awash; the sea does not always break on the SW patch in calm weather. An 11.9m shoal lies 2 miles NW and a 9.4m shoal lies 1 mile S of Naturaliste Reefs; a wide berth should be given these dangers as soundings give little warning.

Bunbury (33° 19'S., 115° 39'E.)

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5.37 The port of Bunbury, situated in the SW part of Koombana Bay, is the principal port of the Southwest District of Western Australia.

Bunbury Port Authority Home Page

<http://www.byport.com.au>

Winds—Weather.—In summer, the prevailing winds are from the SE. In winter, the prevailing winds are from the NW and SW.

Tides—Cur rents.—Tides in Bunbury are usually diurnal. The tide at mean higher high water is 0.9m.

Depths—Limitations.—Berth No. 1 and Berth No. 2 are located in the Outer Harbor, along the E side of the breakwater.

The Inner Harbor, reached by a dredged channel, is situated in the SE sector of Koombana Bay. The Inner Harbor Basin is situated in the SE part of Koombana Bay and approached by a dredged channel which is marked by light beacons and indicated by ranges. The seaward part of the channel is dredged to a depth of 12.8m; the inner part, basin, and berths are dredged to a depth of 12.2m. There are four berths located in the Inner Harbor.

Berth details for the berths in the Inner Harbor and the Outer Harbor are given in the accompanying table.

Bunbury Berth Information			
Berth	Length	Maximum vessel draft	Remarks
Outer Harbor			
No. 1	184m	9.2m plus allowance for tide	Mineral sands. Maximum vessel length is 210m.
No. 2	184m	9.0m plus allowance for tide	Methanol.
Inner Harbor			
No. 3	381m	11.6m	Wood chips.
No. 4	123m	11.6m	Alumina berth. Maximum vessel length is 220m.
No. 5	240m	11.6m	Bulk cargo.
No. 8	250m	11.6m	Bulk cargo.

Aspect—Landmarks.—Koombana Bay is entered between Point Casuarina and the coast about 2 miles NE. The E shore is backed by Leschenault Inlet which extends 7 miles N, parallel to the shore. The E shore of the inlet is backed by a ridge of hills from 30 to 60m high.

A light is shown from a structure standing about 100m S of the N extremity of the outer W breakwater. A light is also



Bunbury—Outer Harbor from NE

shown from a round metal tower, painted in black and white checks, about 0.35 mile SSW of Point Casuarina.

The W side of the outer harbor is formed by a breakwater, about 1 mile in length, which extends NE from Point Casuarina, following the line of the reef. The E side of the outer harbor is formed by a disused jetty, about 1,150m in length, which extends NNE from a position about 0.3 mile SE of Point Casuarina.

The approaches to the dredged channel are marked by a range light and a directional light. The initial range in line, bearing 089.5°, is located in a depression between sand dunes and has been reported (1988) to be difficult to identify. The directional light stands close E of Point Hamilla.

Leschenault Inlet opens into the SW corner of the bay abreast the town. The Preston River and the Collie River flow into the inlet.

Conspicuous landmarks include a group of tanks situated close NE of Point Casuarina Light, a row of concrete silos situated about 0.25 mile E of Point Casuarina Light, a building situated about 0.25 mile SE of Point Casuarina Light, and a group of four chimneys standing at the power station about 0.25 mile N of the alumina berth.

Pilotage.—Pilotage is compulsory for all vessels, except for Australian-flagged vessels having an exempted master. The pilot boards in position 33° 16'30"S, 115° 36'30"E.

**Bunbury—Berth No. 1***Courtesy of Bunbury Port Authority***Bunbury—Berth No. 1 and Berth No. 2***Courtesy of Bunbury Port Authority*

The harbormaster's office, the pilot boat, and the tug are equipped with VHF radiotelephone. The harbormaster must be notified 24 hours and 4 hours prior to arrival; VHF channels are 6, 9, 12, and 16. The pilot boat and the tug may be contacted on VHF channel 16. Pratique is not granted by radio.

The pilot boat should be contacted 1 hour in advance.

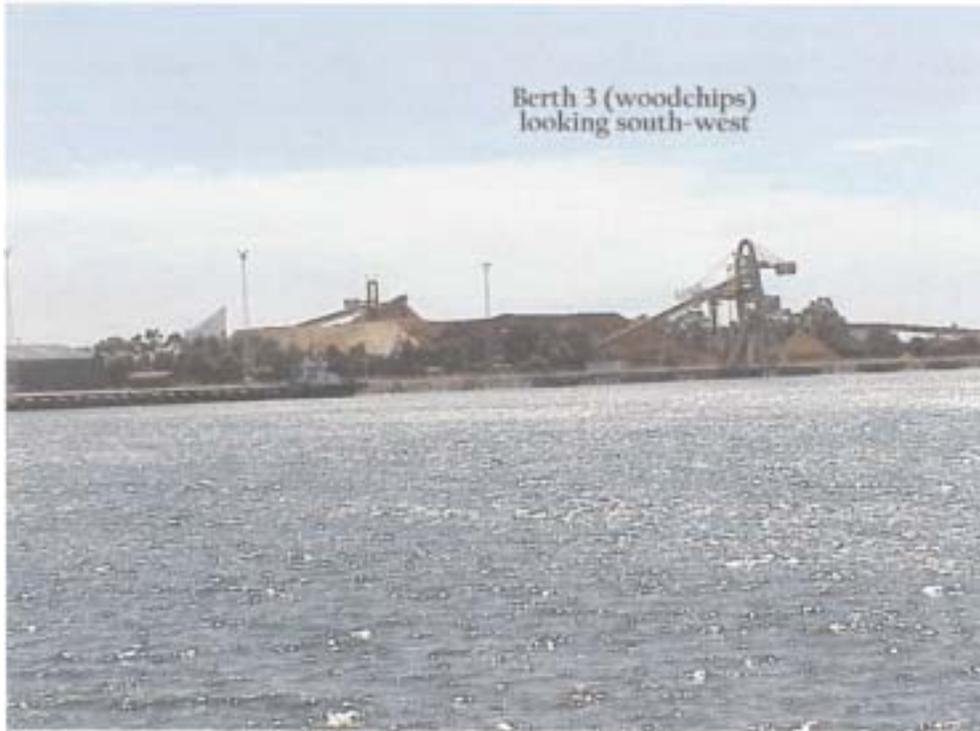
Regulations.—Vessels are normally berthed during daylight hours only, but night berthing may be allowed at the harbormaster's discretion.

There is a speed limit of 8 knots in Koombana Bay and the Inner Harbor.

Anchorage.—Vessels moor under the direction of the harbormaster.

A recommended anchorage off the port is in a depth of 15m, 3.5 miles NNW of Point Casuarina Light. The anchorage is indicated by range lights (33° 16'S., 115° 41'E.), in line bearing 089.5°.

The breakwater affords good shelter during NW gales, which are rather frequent from May to October. The usual anchorage is in 7.3 to 8.2m, sand and mud, ESE and SE of the outer end of the jetty; the holding ground is good.



Bunbury—Berth No. 3

Courtesy of Bunbury Port Authority



Bunbury—Berth No. 4

Courtesy of Bunbury Port Authority

Directions.—In approaching Koombana Bay from the W, Mount Lennard, the highest hill on Roe Range, should bear no less than 103° in order to clear Naturaliste Reefs, which lie about 31 miles WNW of Casuarina Point.

The entrance channel is marked with beacons and range lights. Vessels enter the bay with the range lights on the E shore, in line bearing 157.25° , then steer as necessary for the Outer Harbor or the Inner Harbor.

At night, if from SW, a vessel should not cross depths of less than 15m until well N of Casuarina Point mole.

Caution.—A submarine pipeline, which is disused, extends in a W direction for 2.75 miles from a point on the shore about 4.25 miles NE of Point Casuarina Light.

A strong set is experienced, generally towards the breakwater, more especially during the winter months, and



Courtesy of Bunbury Port Authority

Bunbury—Berth No. 8

vessels should keep about 1 mile off the head of the breakwater when approaching the port.

Geographe Bay

5.38 Geographe Bay (33° 31'S., 115° 21'E.) is entered between Casuarina Point and Cape Naturaliste, 34 miles WSW; it is open to winds from N and NW.

From Casuarina Point, the coast trends 21 miles SW to Wonnerup Inlet; for the first few miles a grassy ridge rises from the beach, and nearly 3 miles S of Casuarina Point a double-peaked grassy hillock, **Koombana Paps** (33° 21'S., 115° 37'E.), rises to a height of 64m. From a position about 7 miles S of Casuarina Point, a continuous swamp extends in a S direction immediately behind the coastal ridge, which varies from 0.1 to 0.5 mile in width. Minninup, a bare sand patch 30m high, is located 13 miles SW of Casuarina Point; it forms one of the conspicuous features in this locality. Mount Lennard, 335m high, about 13 miles E of the same point, is conspicuous.

The coast for a distance of 3 to 4 miles N of sand patch of Minninup is fringed with rocky ledges, some of which dry; about 2 miles N of the sand patch and 0.5 mile offshore, there is a sunken reef, on which the sea breaks during a heavy swell. The whole shore of Geographe Bay, SW of the sand patch of Minninup is fronted by sandy and rocky banks, with depths of 1.8 to 5.5m extending from 0.5 to 1.5 miles offshore; depths of less than 18.3m extend about 3 miles offshore abreast Casuarina Point and 5 miles offshore abreast Wonnerup Inlet.

Wonnerup Inlet has only sufficient depths for boats and is often completely barred. The inlet extends about 0.5 mile E, opening into Wonnerup Estuary, which extends 3.5 miles NE.

Vasse Estuary extends, from its entrance in Wonnerup Inlet, in a WSW direction and passes through Busselton.

5.39 Busselton (33° 38'S., 115° 20'E.) ([World Port Index No. 54490](#)) stands on the S shore of Geographe Bay. The chief export is timber; the chief import is general cargo.

Busselton Jetty is about 1,800m in length, and has two berths at its head. The E berth, 180m long, has a depth of 7.5m alongside; the W berth, 150m long, has a depth of 7m alongside. It is safe to load to a draft of 6.5m in winter and 6.7m in summer.

A light is exhibited from a wooden gallows at the head of the pier; a radio tower stands 5.5 miles W of the jetty.

A shoal, with a depth of 5.5m, lies 0.5 mile ENE of the head of the jetty; in 1967, less water was reported close W of this shoal. Patches of gravel, with depths of 4.9 to 5.5m, lie from 1.75 to 3 miles W of the jetty.

Anchorage can be obtained 0.5 mile W of the outer end of the jetty in a depth of 9m, sand and weed.

Caution.—The port is reportedly closed to commercial traffic.

Toby Inlet (33° 37'S., 115° 09'E.), which is generally closed, is located 8.5 miles W of Busselton Jetty; Dalling Point lies 4 miles NW of the inlet. Castle Rock, nearly detached from the coast and 34m high, lies 1 mile N of Dalling Point. A fish haven, with a depth of 21m, lies about 3 miles ENE of Dalling Point.

Eagle Bay is a small indentation in the coast about 3.5 miles N of Dalling Point; the coast between them rises abruptly from the beach to heights of 107 to 131m. Anchorage can be obtained, with local knowledge, in Eagle Bay during S and SW winds, about 0.75 mile offshore.

Bunker Point, dark, cliffy, and about 61m high, is located 1.5 miles E of Cape Naturaliste; Rocky Point, a bare rocky headland, is located 1.25 miles farther E. **Bunker Bay** (33° 33'S., 115° 02'E.) lies between the two points. A rock, with

a depth of less than 1.9m, is located 0.6 mile NNE from Bunker Point.

5.40 Cape Naturaliste (33° 32'S., 115° 01'E.), 122m high, is the W headland of Geographe Bay; its extremity is formed of low sandy hillocks. About 6 miles S of the cape stands Mount Duckworth, 227m high, with a ridge of high land between them, which falls abruptly on its E and W sides. Cape Naturaliste Light is exhibited from a gray stone tower situated about 1 mile ESE of the cape. Radar returns from Cape Naturaliste have been reported up to 26 miles distant.

Caution.—There is a rock, with a depth of less than 1.8m, 1 mile NE of Cape Naturaliste lighthouse; the sea does not always break on this rock. A similar rock lies about midway between this rock and Cape Naturaliste.

Wright Bank (33° 30'S., 115° 01'E.), with a reported (1985) least depth of 6m, consists of two patches 0.5 mile apart, from 1.5 to 2 miles N of Cape Naturaliste. The sea breaks over these patches in a medium swell; in strong gales, the rollers begin 0.5 mile W of these shoal spots, which indicates the edge of the shallow water. There is a depth of 42m, gravel and shell, 100m N of the bank. Vessels should not pass inshore of Wright Bank.

A fish research area, marked by a lighted buoy, is situated about 15 miles W of Cape Naturaliste.

Current.—After NW gales or a continuance of NW winds, there is a strong outset from Geographe Bay NW, which, meeting the swell off Cape Naturaliste, produces at times an appearance of broken water extending 3 to 4 miles from the cape.

Cape Naturaliste to Cape Leeuwin

5.41 Sugarloaf Rock (33° 33'S., 115° 00'E.), a remarkable crag 42m high, is located 0.1 mile offshore, 1.5 miles S of Cape Naturaliste. An unbroken cliffy coast extends 4.5 miles S of the rock, and 2 miles beyond lies the S entrance point of a small bight, with several rocks awash lying off it. A rock, 3.7m high, is located 0.4 mile NNW of the S entrance point of this bight.

Winjee Sam Rock (33° 40'S., 115° 00'E.), 6.5 miles S of Sugarloaf Rock, is 14.3m high, and is the outermost of a group known as Canal Rocks.

Cape Clairault (33° 42'S., 114° 58'E.), 10 miles S of Cape Naturaliste, is 36m high, and is formed of sandy hillocks sparsely covered with low scrub brush. The coastal ridge behind the cape rises abruptly to heights of 150 to 200m.

Between Cape Clairault and Cowaramup Point, 10 miles S, there are several breaks in the cliffs, through which brooks flow into the sea. A partially wooded hill, 187m high, stands about 2 miles SE of Cowaramup Point. Along this rugged coast, several submerged rocks lie from 0.1 to 0.35 mile off its entire length.

Cowaramup Reef (33° 50'S., 114° 57'E.), with a depth of less than 1.8m and over which the sea breaks in a heavy swell, lies 2 miles NNW of Cowaramup Point, 1.5 miles offshore; the ground is foul between the reef and the coast.

Cowaramup Point (33° 52'S., 114° 59'E.) is a bare sandy projection, with rocky ledges extending 0.35 mile NW from it.

Cape Mentelle, 6 miles S of Cowaramup Point, is a dark green headland, 43m high, faced with a steep cliff to the W, and rising within to a height of 69m; rocky ledges, which dry, front the cape extending 0.3 mile offshore.

Cow Rock (33° 58'S., 114° 58'E.), 3.6m high, with a small submerged rock 0.1 mile N of it, lies 0.6 mile WNW of Cape Mentelle.

The mouth of the Margaret River, which is generally barred by sand, lies close S of Cape Mentelle; a high wooded hill rises abruptly from the S side of the entrance. A prominent building stands about 0.3 mile SE of the river mouth.

The coast from Cape Mentelle to Freycinet Point, 8 miles S, is fronted by drying and submerged rocks, which extend up to 1 mile offshore.

5.42 Freycinet Point (34° 06'S., 114° 59'E.) is a low, dark, rocky point, 18m high, with a flat-topped granite hill, 55m high, a short distance E of it. The sea breaks on a rock, awash, 0.2 mile SW of the point.

North Point lies about 4 miles SSE of Freycinet Point; there is a long dark rock, 12m high, on the rocky far shore close W of it. Boranup Hill, 196m high, stands 1.5 miles NE of North Point. A 10.3m patch is situated outside the 20m curve, 1.25 miles SW of North Point.

Hamelin Bay (34° 11'S., 115° 01'E.) is entered between North Point and **White Cliff Point** (34° 13'S., 115° 01'E.), 4 miles S. Boranup Sand Patch, located in about the middle of the E side of the bay, is a conspicuous landmark which rises from 143 to 192m high, 1.5 miles from the coast; in clear weather it is visible from a distance of more than 20 miles. White Cliff Point is fringed by cliffs about 22m high.

The waters of Hamelin Bay are encumbered by numerous rocks and shoal patches which are awash.

Edith Rock, about 1.75 miles NW of White Cliff Point, is 4.2m high. Two rocky ledges, which dry, lie 0.25 mile SW of Edith Rock; some rocks, with depths of 2.7 to 5.5m and on which the sea generally breaks, lie 0.5 mile SSW of the same rock.

5.43 Old Man Rock (34° 12'S., 115° 00'E.), 2m high, lies near the W edge of the ledges, which dry in places, extending 1.25 miles WNW from White Cliff Point; the ledges extend up to 0.5 mile around the rock.

Hamelin Island, 32m high, lies near the outer end of a reef which extends 0.75 mile W of White Cliff Point. The island, with the adjacent reefs, protect the inner harbor and also the bay to a certain extent, from S winds.

South Rock, with a depth of 4m, and South East Ledge, with a depth of 5.8m, lie 1 mile NNW and 0.9 mile N, respectively, of White Cliff Point.

Peak Islet (34° 12'S., 115° 01'E.), 13.1m high, lies 0.45 mile WNW of White Cliff Point. A reef, with depths of less than 5.5m, extends 0.2 mile E from the islet; its E end forms the NW side of the entrance channel to the Inner Harbor.

Mushroom Reef, about 0.2 mile ESE of Peak Islet, has several patches, awash, and one which dries 0.3m. The reef has a 1.2m patch about 0.35 mile N of White Cliff Point, which lies on the SE side of the entrance channel to the Inner Harbor.



Cape Leeuwin from S distant 5 miles

5.44 Hamelin Inner Harbor (34° 12'S., 115° 01'E.) lies between Peak Islet and Mushroom Reef, on the N, and Hamelin Island and adjacent reefs, on the S and SW. A jetty, which has been condemned as unsafe for traffic, extends about 0.3 mile WNW from the shore, 0.2 mile NE of White Cliff Point. The harbor has been reported closed to shipping.

Anchorage may be taken in Hamelin Bay; vessels should ride with a long scope of cable. From the beginning of May until the beginning of November, upon the usual indications of a NW gale, vessels of too deep a draft to find protection in the Inner Harbor are advised to put to sea and seek shelter in Flinders Bay until the gale is over. Anchorage may also be taken 0.3 mile ENE of the SE extremity of Peak Islet, in depths of 11m, sand and weed.

Vessels approaching the anchorage from the N should give Freycinet Point a berth of about 2 miles, and when the middle of Boranup Sand Patch bears about 085°, steer to pass 0.3 mile N of Edith Rock, and then to the anchorage.

From S, give Cape Hamelin a berth of at least 4 miles, keeping outside the 40m curve. When Hamelin Island summit bears more than 050°, Old Man Rock and Edith Rock will be visible. Steer to pass through Lisle Channel, about 0.3 mile WNW of Old Man Rock.

If passing outside Edith Rock from the S, give it a berth of 0.5 mile and steer into the bay, passing 0.3 mile N of the rock and then to the anchorage.

The coast from White Cliff Point to Knobby Head, 2 miles S, forms the E side of Foul Bay. Foul Bay is so encumbered with sunken reefs it is useless as an anchorage or place of shelter. Foul Bay Light is exhibited from a white square tower, 6m high, situated about 1.5 miles SSE of White Cliff Point.

Knobby Head (34° 14'S., 115° 02'E.) is smooth and grassy, 41m high, with a high reddish cliff to seaward. A short distance within the head are some dark bush-topped sand hills, from which a large bare sand patch extends to the SW, and is not visible from NW.

Seaward of Knobby Head there are several ledges, awash and submerged, with a rock with a depth of less than 1.8m, lying 1.5 miles W of the head; the sea breaks on this rock with a heavy swell.

Southwest Rock (34° 14'S., 114° 59'E.), 2m high, lies 1.75 miles NW of Knobby Head. Breakers have been observed for about 0.4 mile SW of Southwest Rock.

Cape Hamelin (34° 15'S., 115° 02'E.) is a low cliff-faced point, fronted with numerous drying ledges and sunken rocks which extend 1.5 miles W, 1.75 miles SW, and 2 miles S. There is a rock, 15m high, about 0.6 mile NW of the cape.

From Cape Hamelin, the coast trends SE 8 miles to Cape Leeuwin. Nearly 1 mile SE from Cape Hamelin, Turners

Brook flows into the sea. On its S side and 0.5 mile above its mouth, a perpendicular cliff rises on the NW side of an 84m hill and is conspicuous when seen from SW.

A high and conspicuous sand patch is located 2.25 miles SE of Cape Hamelin, which, in hazy weather, may possibly be mistaken for Boranup Sand Patch in Hamelin Bay.

The coast between Cape Hamelin and Cape Leeuwin is fronted by reefs extending up to 4 miles offshore.

5.45 Cape Leeuwin (34° 22'S., 115° 08'E.), the SW extremity of Australia, lies 8 miles SE of Cape Hamelin. Cape Leeuwin is a small round head, about 21m high, joined to the mainland by a low swampy isthmus. Within the cape, the land rises abruptly to a height of 149m, in a position 1.25 miles NNE of the cape. From this position, the hills extend, with a few breaks, NNW beyond Cape Hamelin, attaining a height of 222m, 3.5 miles NNW of Cape Leeuwin.

Cape Leeuwin Light is exhibited from a gray round stone tower situated on the south summit of the cape. Cape Leeuwin has been reported to give good radar returns up to 17 miles.

Caution.—Reefs extend up to 5 miles SE from the cape.

Off-lying Dangers.—Geographe Reef (34° 19'S., 114° 59'E.), 4 miles offshore and 8 miles WNW of Cape Leeuwin, consists of two steep-to submerged rocks about 0.1 mile apart, close inside the 40m curve; in moderate weather, the sea breaks at uncertain intervals.

Minns Ledge, 2m high, lies about 2 miles ENE of Geographe Reef; there are many rocks between it and Cape Hamelin, 2.25 miles N.

Cumberland Rock, 10m high and of a dark color, lies 4.5 miles NW of Cape Leeuwin. The outer submerged reef in this vicinity lies 1.25 miles SW of Cumberland Rock; the reef breaks only during a heavy swell. Jacks Ledge lies inside Cumberland Rock. Between Cumberland Rock and Cape Leeuwin, there are many submerged rocks on which the sea breaks in heavy weather.

5.46 St. Alouarn Islet (34° 24'S., 115° 12'E.) lies 3.5 miles SE of Cape Leeuwin; Southeast Rocks extend 1.5 miles farther SE. A sunken rock lies about 0.1 mile E of them.

Southwest Breaker, on which the sea seldom breaks, is the S extremity of the reef; it has a depth of 3m, with 24m close seaward. The rock lies about 4.75 miles SSE from Cape Leeuwin Light.

The W rock of the rocky chain has a depth of 3.2m and lies about 2.5 miles SSE from Cape Leeuwin Light. The sea only breaks over this rock in bad weather. The position of the rocks may best be seen on the chart.

General directions for rounding Cape Leeuwin.—The distance to which submerged dangers extend off a long stretch of the coast in the vicinity of Cape Leeuwin, and the frequent thick weather that prevails with strong onshore winds and a set towards the coast, renders it imperative to give this dangerous cape a berth of at least 15 miles in all but settled weather and good visibility.

When approaching the coast between Cape Naturaliste and Cape Leeuwin by day, in clear weather, vessels may navigate

into a depth of 55m, the bottom being coarse sand mixed with shells and small stones.

Great caution should be used in navigating at night to make Cape Leeuwin Light; with reduced visibility the light may not be visible as far as Geographe Reef, 8 miles NW, due to mist hanging about the land when it is clear at sea. Soundings should not be neglected, and vessels should not venture into depths of less than 128m.