2828
2828a

Diag. Chy. No. 8551-1

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. ..... Office No. 2628

LOCALITY

State Alaska

General locality Prince William

Locality Sound.

1902

CHIEF OF PARTY

H. P. Ritter

LIBRARY & ARCHIVES

DATE .....

B-1870-1 (1)++

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2628

Treasury Department,
U. S. COAST AND GEODETIC SURVEY.

O. H. Tittmann
Superintendent

State: Alaska

DESCRIPTIVE REPORT.

Hydrographic Sheet No. 2628

LOCALITY:

Prince William Sound
Valdez Arm Entrance

1902

CHIEF OF PARTY:

H. P. Ritter

FORM 65.—Field Letter.

(1)

~~Post-Office Address:~~

~~Telegraph Address:~~

~~Express Office:~~

—644

Department of Commerce and Labor

COAST AND GEODETIC SURVEY

Washington, D.C.
Dec. 14, 1903.

Descriptive Report
to accompany
Hydrographic Sheet No. 2628.

Homer P. Ritter
Assistant

2628

Title:

Treasury Department
U.S. Coast and Geodetic Survey
O.H. Tittmann, Supt.
Prince William Sound
Valdez Arm Entrance
Alaska

Surveyed by H.P. Ritter, Assistant, Chief of Party
1902.

Scale 1/20000.

Notes:

The soundings are expressed in fathoms and show the depth at the mean of the Lower Low Waters.

The 3 fath. curve is shown thus ———
" 5 " " " " " ———
" 10 " " " " " ———
" 20 " " " " " ———
" 50 " " " " " – – – – –
" 100 " " " " " —·—·—·—
" 150 " " " " " —··—··—
" 200 " " " " " —···—···—

Tides:

	Rocky Point
Mean low water or plane of reference on staff	3.98 feet
Lowest tide observed " "	0.50 "
Highest " " " "	18.30 "
Mean rise and fall of tide	9.69 "

Lettered by H.S. Gamble
Plotted and inked by F.C. Donn.

Statistics for Str. Taku

Totals: 3058 angles, 7440 Soundings, 386.2 miles, 85.6 Sq. miles.

Date		Letter	Volume	Vessel
Sept 12	1902	D	1	Str. Taku
" 15	"	E	1	"
" 17	"	F	1	"
" 18	"	G.	1	"
" 23	"	H	1	"
June 28	"	t	4	Steam Launch 28
" 30	"	u	4	"
July 1	"	V	4	Whaleboat
" 3	"	x	5	Steam Launch 28
" 5	"	y	5	"
" 7	"	z	5	"
" 8	"	a'	5	"
" 9	"	b'	5	"
" 10	"	c'	5	"
" 11	"	d'	5	"
" 15	"	e'	6	"
" 16	"	f'	6	"
" 18	"	g'	6	"
" 22	"	h'	6	"
" 23	"	j'	6	"
" 25	"	k'	6	"
" 26	"	l'	6	"
" 28	"	m'	6 + 7	"
" 29	"	n'	7	"
Aug. 1	"	o'	7	"
" 2	"	p'	7	"
" 7	"	q'	7	"
" 8	"	r'	7	"
" 13	"	s'	7	"
" 15	"	t'	7+8	"
" 16	"	u'	8	"
" 20	"	v'	8	"
" 21	"	w'	8	"
" 22	"	x'	8	"
" 23	"	y'	8	"
" 25	"	z'	8	"
" 26	"	a"	9	"
" 27	"	b"	9	"
Sept. 3	"	c"	9	"
" 5	"	d"	9	"

General Description of Valdez Arm

For the general description of Valdez Arm and additional detailed descriptions of the shoreline, topography, fauna and flora etc. of the territory comprising the accompanying hydrographic sheet (2628) and vicinity see:

Descriptive Reports accompanying Topographic Sheets Nos. 2565 and 2574 and Hydrographic Sheets Nos. 2554 and 2627.

Extent of Hydrographic Sheet No. 2628

The hydrography shown on the accompanying sheet (No 2628) takes in Valdez Arm from Galena Bay, where it joins Hyd. Sheet to No. 2627, to the entrance and includes Tatitlack Narrows, Virgin, Boulder, Cloudman and Busby Bays, and a portion of the main body of Prince William Sound along the western and southern shore of Bligh Island.

Description of Valdez Arm from the Entrance to Galena Bay.

Considering a line drawn between Ot. Fremantle on the north to the western end of the island (Seal Island) just west of the northwestern side of Bligh Island as defining the entrance to Valdez Arm, the distance across is found to be 6½ nautical miles.

From here the Arm extends in a northeasterly (true) direction, gradually becoming narrower as you ascend the Arm.

At the mouth of Galena Bay it is a little over 3 miles wide.

In this stretch of about 9 miles the northern shore is bold and rocky, perpendicular cliffs coming down to the waters edge the entire distance with but two exceptions, where there are shingle beaches of limited extent, covered with boulders along the shore and out into the water some distance forming

submerged reefs.

The land close to shore rises abruptly. The mountain tops close to shore near Pt. Fremantle attain heights of from 2000 to 2500 feet and become much higher as you ascend the Arm.

The shore and mountain slopes of this side of the Arm are wooded with spruce, hemlock, alder and dense underbrush.

On the other side of the Arm in this stretch the shore is broken up with bays, coves, islands, rocks and inshore reefs.

The shore here is indented by Galena Bay extending some distance into the mainland; Tatitlach Narrows, the latter separating Bligh and its contiguous islands from the mainland; and Busby Bay indenting the northern side of Bligh Island.

Bligh, Busby and Seal Island are the principal ones of the numerous islands found on this side of the Arm.

The land close to the shore is comparatively low, being the broken up and partly submerged ends of mountain spurs and glacial debris coming down from the higher land farther inland.

Spruce, hemlock, alder, dense underbrush and moss and grass covered open places or tundras constituting the flora on this side of the Arm.

From Galena Bay to the entrance of the Arm and out into the Sound deep water, extending almost to the shores on either side, is found in the major part of this stretch.

The deepest water is in the middle where there is an area of considerable extent having depths from 190 to 210 fathoms.

The area bounded by the 100 fathom curve embraces a large part of the waterway.

The detailed configuration of the bottom etc. along the shore on either side is shown on the sheet.

Tatitlack Narrows.

The narrow body of water separating Bligh and Busby Islands from the mainland and connecting with Hidalgo Arm on the south and Valdez Arm on the north is locally known as Tatitlack Narrows.

The general direction of the Narrows is northwest and southeast (true)

Eastern Shore of Tatitlack Narrows.

From the somewhat low and tundra covered point which separates the southwestern end of Boulder Bay from the Narrows, to Virgin Bay the shore is low, having a shingle beach thickly strewn with boulders and rocks a number of which project out of the water some distance from shore.

Half way between the point and Virgin Bay is a small rock-surrounded island which is connected with the mainland at low water.

Inland from the shore the ground rises gradually for half a mile or so and then ascends abruptly up the mountain side.

Tundra meadows and a few scattered spruce cover this flat or bench, while the mountain side is heavily wooded.

On the southern end of the flat and close to shore is the Indian village of Tatitlack.

This village consists of a score of modern looking frame dwellings and a church of the Russian denomination.

From Virgin Bay to Rocky Pt. the shore is bold and rocky with numerous small islands and rocks along shore and some distance out.

A number of coves indent the shore.

The land contiguous to this stretch is high and densly wooded the northern end of which is a

high neck of land 3/4 of a mile in width forming the western boundary of Galena bay near its entrance.

Western shore of Satitlach Narrows

Close to the shore and along the entire front of the eastern side of that part of Bligh Island which forms the western side of the Narrows, is a cordon of islands and rocky ledges.

The islands vary from 10 feet to 30 feet in height and are covered with tundra meadows and patches of spruce. North of the northern end of Bligh Island and separated from it by a narrow, shallow and rockfilled channel is Busby Island forming the western shore of the northern entrance to the Narrows.

Here the shore also is rocky, some of the ledges extending out some distance.

At present the southern part of the Narrows is only used by

small craft and by pilots having local knowledge; but by the placing of one or two buoys and a few range beacons a channel having no less than 27 ft at low water would become available.

Virgin Bay:

On the eastern side of Tatlitlack Narrows and about midway between Copper Mt. Pt and Rocky Pt. the mainland is indented by a cove or small bay known as Virgin Bay.

The bay is less than a mile long and half a mile wide with a rocky ledge in front leaving a narrow entrance to the bay.

The northern end of the bay is sometimes called Gladhaugh Bay, after the locator of a large copper bearing vein of ore which here crops out at the waters edge.

The mineral worth of the vein is now being explored by a company which is sinking shafts and has put up quite an extensive plant of machinery necessary for the work.

The plant consists of a steam hoisting gear - compressed air apparatus - electric lighting - machine shop - steam lathe and drill - blacksmith shop etc.

The ore taken out is shipped to a smelter at Tacoma, Washington.

4 to 5 hundred tons are being shipped by steamers monthly.

The company has put up an assay office and a wharf with facilities for watering ships.

There is a Post office here known as Ellamar P.O.

The company operates a store having a good assortment of stores and general merchandise suitable to the wants of the surrounding community

a hotel and from 20 to 30 residences comprise the settlement at present (1903).

Large steamers going to the wharf at Ellamar wait for half tide or high water before docking.

A black buoy put in by the mining company locates the outer end of the channel way to the wharf.

While the party was surveying in this vicinity (1903) the following steamers were seen at the wharf.

at Ellamar at various times.

P. P. & N. Co's. Str. Nome City (mail Str.)
" " " " " Santa Ana "
" " " " " Excelsior "
" " " " " Newport "
A. C. Co's. " Bertha "
Str. Elihu Thompson
A. P. A. Cannery " Pacific
U. S. C. & G. S. " Yukon
U. S. army " Lily
P. P. & N. Co's. Can. " Sylph
" " " " " " Wildcat
Valdez local " Perry
and a number of smaller boats.

Boulder Bay:

Two miles north of Copper Mt. Pt. and east of the southern end of Tatitlack Narrows is a pear shaped bay which is locally known as Boulder Bay, from the large number of boulders (some of enormous size) which cover the beach between high and low water and extend in numerous places out to deep water.

The bay is about 1½ miles wide at its mouth and extends in a northerly direction two miles.

The land contiguous to both sides of the bay is comparatively low at the southern end, rising rapidly as you proceed northward, with steep rugged and high cliffs coming down to the waters edge at the northern end.

It is the foot of the western slope of Copper Mountain which forms the eastern shore of the bay.

Numerous waterfalls come down the mountain side, and in the

Spring and early summer snow avalanches are frequent.

A number of mineral lodes, mostly copper ores have been found in this vicinity.

Starting from the middle of the bay and extending in a northerly direction and nearly joined to the shore is a rocky reef and several small islands.

This partially submerged ridge divides the upper part of the bay into two halves.

The depth of water in the major part of the bay is from 20 to 30 fathoms. These depths extend to the extreme northern part of the bay.

Cloudman Bay:

This bay indents the eastern side of Bligh Island, and lies just west of the southern end of Tatitlack Narrows.

The bay or more properly speaking cove is approximately 3/4 of a mile long and 1/2 a mile wide.

A channelway having no less than 5 fathoms of water extends nearly to the head of the bay.

About 1/2 a mile southeast (true) of the mouth of the bay is a submerged rocky reef, a small part of which shows at extreme low waters.

At the western end of the bay are the dwellings and other buildings belonging to a Mr. Preston Cloudman who lives here and is engaged in raising blue foxes.
He also raises chickens & garden truck having a ready market for his chickens eggs etc. at the neighboring mining town of Ellamar.

Busby Bay:- This bay indents the northern end of Bligh Island.

At the entrance and for about 1½ miles inland the bay is approximately half a mile wide, extending in a southeasterly direction; it then makes a sharp turn to the westward and from here to the head of the bay, 3/4 of a mile distant is less than 1/4 of a mile wide.

The channelway of the bay lies between the middle and the western side; numerous rocky reefs being found on the eastern side as far out as the middle of the bay.

At the entrance the depth in the channelway is 20 fathoms. This depth gradually lessens to about 5 fathoms half way up the bay.

Just before the turn to the westward is reached it shallows up abruptly to 3 fathoms and less and remains shallow to the head of the bay.

The beach along the shores of both sides of the bay is mostly shingle strewn at a number of places with boulders.

The land contiguous to the western shore is high, steep and dinsly wooded while that on the eastern side is low with tundra meadows and patches of spruce.

Some timber is being cut in this locality by natives from Tatitlack who take it over to the mine at Ellamar; two natives in a bidarka (skin boat) towing from one to two or three logs at a time.

It is not known that any steamer with the exception of the U.S. C.G.S. Str. Taku, has ever been in this bay.

Bligh Island.

Bligh Island is an island of some extent, in the northeastern part of Prince William Sound.

It lies close to the mainland, from which it is separated by a narrow waterway known as Patitlack Narrows.

The island is about half way between Knowles Head and Pt. Fremantle.

The island is about 5 miles long and 4 miles wide.

The main body of the island is mountainous; a number of the peaks attaining elevations of from 1400 to 1500 feet above the sea.

A large part of the island is wooded (spruce); The remainder of the island has the usual covering of peat, moss, bushes, grass, flowers, bogs & ponds.

The southern and south half of the western shore is bold and pricipitous with a rocky beach

but deep water quite close in.

From the middle of the western and thence around the northern and eastern side of Bligh Island and contiguous to the shore are numerous outlying islands varying in extent from a few square yards to 3/4 of a square mile; the principal ones being Seal Island near the western and Busby Isld. near the northern end.

Between Seal and Busby Island, forming the southern side of Valdez Arm Entrance, the approach to the shore and Busby Bay, which here indents Bligh Island, there are numerous rocks and rocky reefs contiguous and some distance out from the shore.

Seal Island:

This island is about a mile long; a little less than a quarter of a mile wide; is densly wooded (spruce) and in the middle (the highest part) is something over 300 feet high. The waterway between

it and Bligh Island is about ½ a mile wide.

A little south of west (true) and about a mile from the western end of Seal Island is a rocky reef having less than 2 fathoms of water on it at low tides.

There is a good channelway between the reef and the western extremity of Seal Island. This channel is now being used by a number of Captains of the large steamers on the Valdez route.

The reef is a dangerous menace to navigation and should have a buoy placed at each end.

Quite a number of commercial steamers, notably the "Bertha", "Excelsior" and "Oregon" have had their keels ripped off on this reef.

Busby Island.

This island sometimes called "Fox Island" is an irregular shaped island, just north of the northern end of Bligh Island; from which it is separated by a narrow shallow and rock filled channel.'

The island is comparatively low, the highest part (near the north shore) being about 250 ft. high.

Part of the shore is rocky, the remainder shingle beach strewn with boulders. Numerous rocky ledges extend out from shore on all sides.

The island is partially wooded. Several small coves indent the island, on the shore of one of them (the one emtying into Satitlack Narrows) are the dwelling houses and other buildings of a Mr. Busby who is engaged in raising blue foxes on this island.

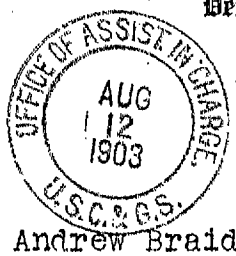
Homer P. Ritter
asst. C.G. Survey

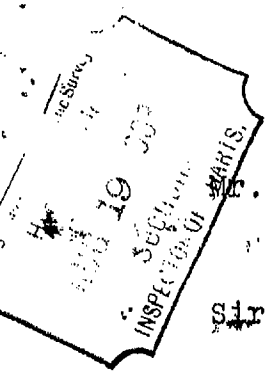
(2628) Mr Bradford & Mr Ogden
Aug 17.03

EM

Department of Commerce and Labor
COAST AND GEODETIC SURVEY
Washington

Copy to HP Ritter
8/15/03





August 12, 1903.

Ass't in chg. his instructions of July 15. 03

Mr. Andrew Braid,

Assistant in charge of the Office.

Sir:

I have the honor to make the following report as prepared by Mr. Donn, on Hyd. Sheet No. 2628, and in connection with Top. Sheet No. 2574, surveyed by Assistant Ritter in 1902 and 1901 respectively:

The projection for Sheet 2628 was furnished from the Office, with shoreline enlarged from Top. Sheet 2574. The N. W. shore of Seal Island, the shoreline of Busby Bay and the South and West sides of Bligh Island were not surveyed on Sheet No. 2574.

Pup Island, on Hyd. Sheet 2628, is about 160 meters N. W. of position of same Island on Top. Sheet 2574. The S. E. shoreline of Seal Island is about 160 meters at its N: E. end and about 250 meters at its S. W. end, S. W. of its position on Top. Sheet 2574.

There seems to be no records of the shoreline omitted on Top. Sheet 2574 other than Hyd. Sheet 2628. The only way the differences between shoreline on the Hyd. sheet and the same shoreline on the Top. sheet can be accounted for is that the shoreline of the Islands Seal and Pup (Sketch 1), Ram Island (Sketch 2), Islands B.1 and B.3 was shifted to agree

with positions of signals as determined during the season, and positions of ends of lines determined by use of the same signals. These lines or boat positions depend upon signals Cat ⊙, Dog ⊙, Seal ⊙, Seal 2 ⊙, Pup ⊙, Pup 2 ⊙, Oar ⊙, Crow ⊙, B.1 ⊙, B.2 ⊙, and B.3 ⊙. As the difference in position of these ispands depends upon the position of the above signals, an effort was made to trace up the method of their determination. No record of horizontal angles was found in the Archives, but on the fly-leaves of two sounding books there is a record of angles, and a diagram (Sketch 5) of a triangulation to determine Seal ⊙, Oar ⊙, and Pup ⊙, from a base Free ⊙ to Rat ⊙. Angles were measured at Free ⊙ and Rat ⊙, but the angles at Oar ⊙, Pup ⊙ and Seal ⊙ are concluded.

By inspection of the records of angles, it was found that Ledge ▲ and Preston ▲ were used as a base, and angles measured between Mar 2 ⊙, Ram ⊙ and Rock ▲ (Sketch 5). Then Mar 2 ⊙ and Ram ⊙ were occupied and determined by angles on Rock ▲, Preston ▲ and Ledge ▲. This determination of Ram ⊙ (which is shown on the south end of the little island of the same name) places that island about 70 meters N. and 80 meters West of the position shown on the topographic sheet.

From Mar 2 ⊙ angles were measured to Flow ▲ and Free ⊙ and Rock ▲. From Ram ⊙ angles were measured to Flow ▲, Free ⊙ and Oar ⊙. As the base Mar 2 ⊙ to Ram ⊙ is so very short the intersection at Free ⊙ is too acute to give a reliable determination of that signal, yet that determination

is all the record shows, and it is the main support for locating the position of Rat ⊙, the other end of the base upon which the positions of Cat ⊙, Dog ⊙, Seal ⊙, Seal 2 ⊙, Pup ⊙, Pup 2 ⊙, and Oar ⊙ depend.

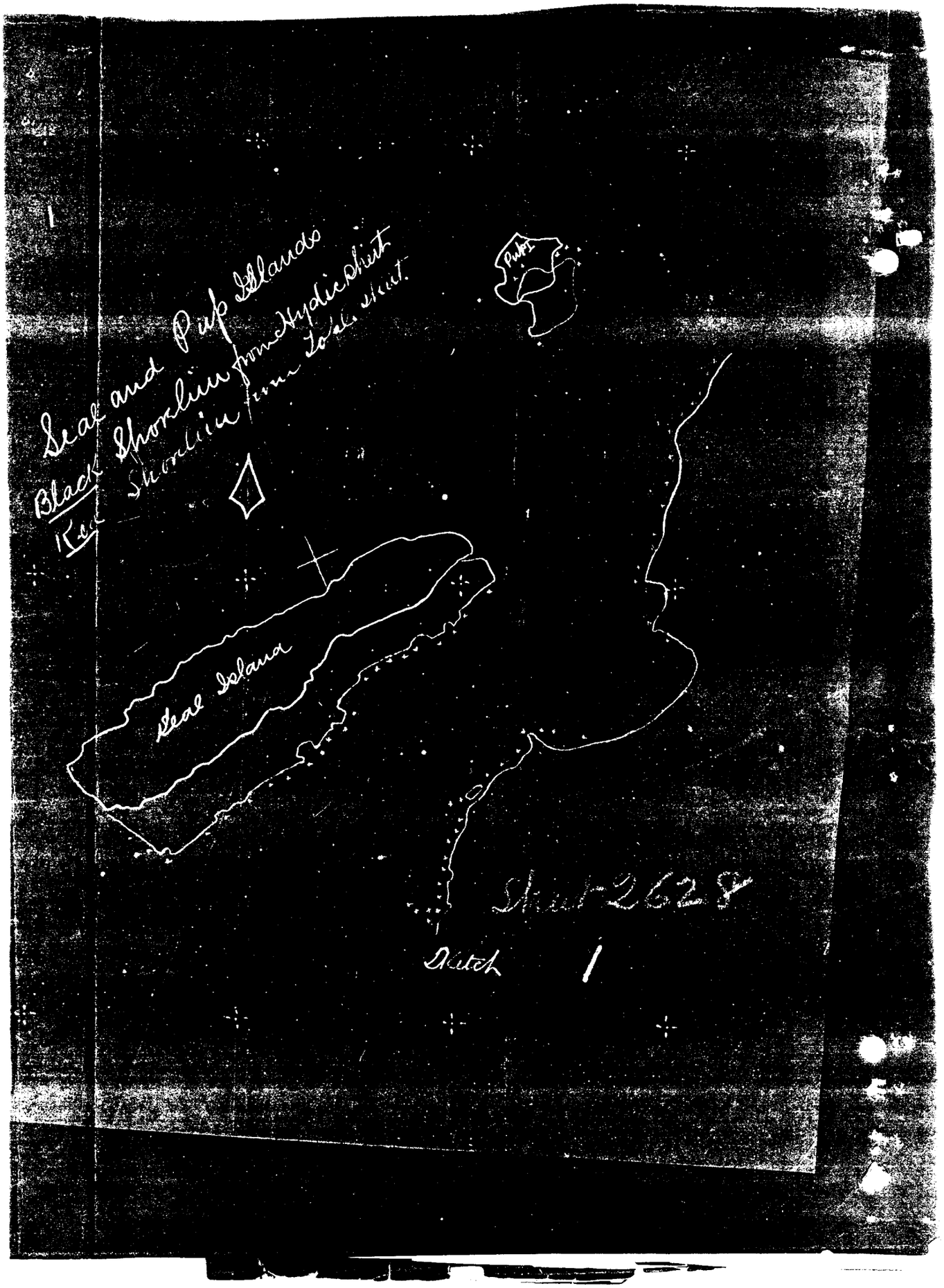
Until more information is given than can be found in the records in the Office, it seems a doubtful proceeding to accept the change in shoreline as shown by Hyd. Sheet 2628. If there were no other records than those filed in the Office then an additional or new triangulation should be made, occupying Rock ▲, Flow ▲, Oar ⊙, Tree ⊙, Rat ⊙, Seal ⊙, and Pup ⊙ at least.

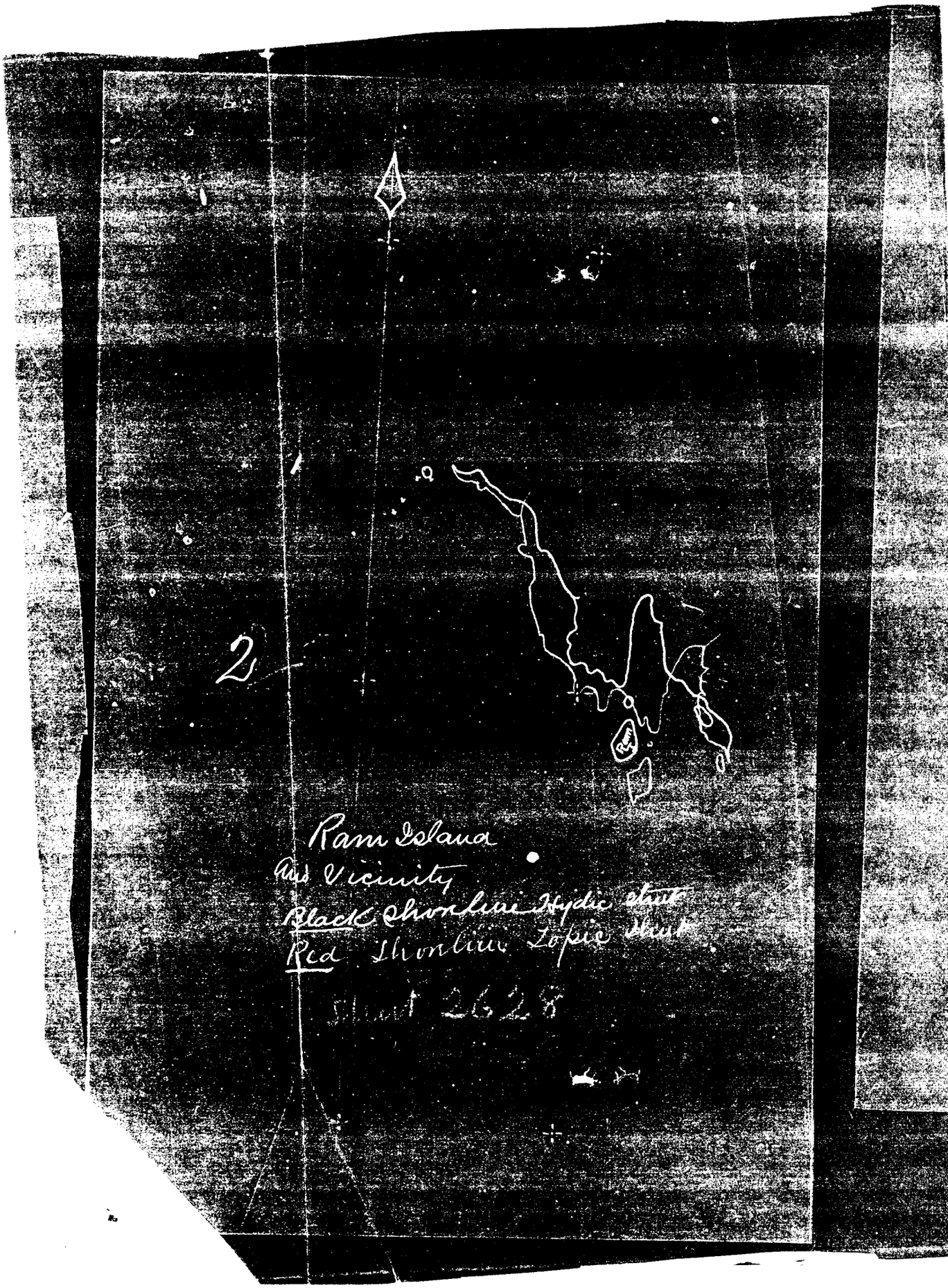
There are many other hydrographic signals used without record for locating or only indifferently located, namely; Gale ⊙, B.1 ⊙, to B.11 ⊙, Crow ⊙, Seal 2 ⊙, Flow 2 ⊙, Cat ⊙ and Dog ⊙. There may be in some of the sounding books angles to locate some of these signals mentioned. However, that may be, the point to be made is this: that all angles locating signals should be recorded in the book provided for that purpose, or at least in a book separated from the soundings, and not on the fly-leaf of a sounding book.

Sketch 4 shows a difference in shoreline not depending on signals at all, but on boat positions as to the South end of the large island and North end of small island.

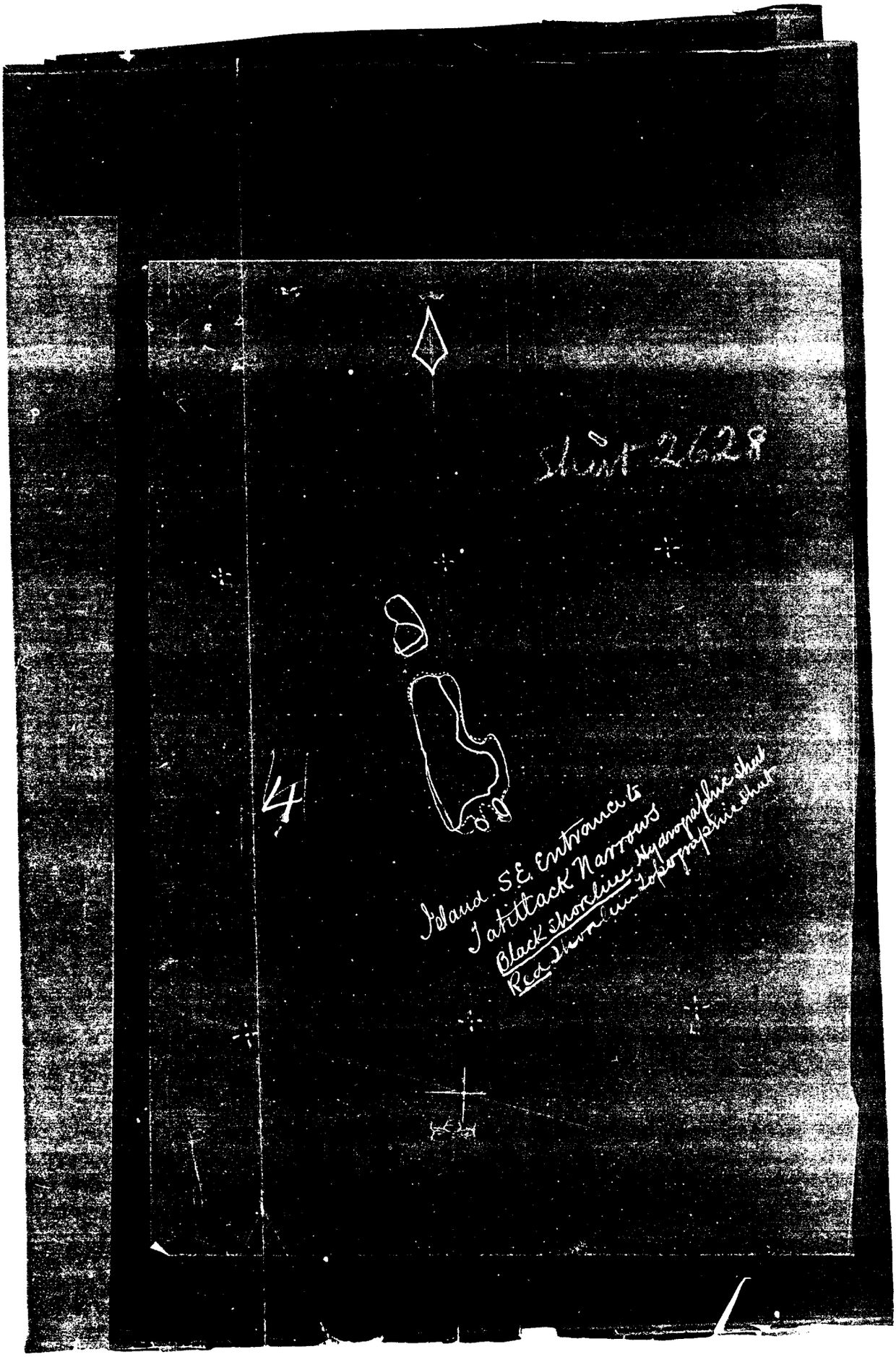
Respectfully,

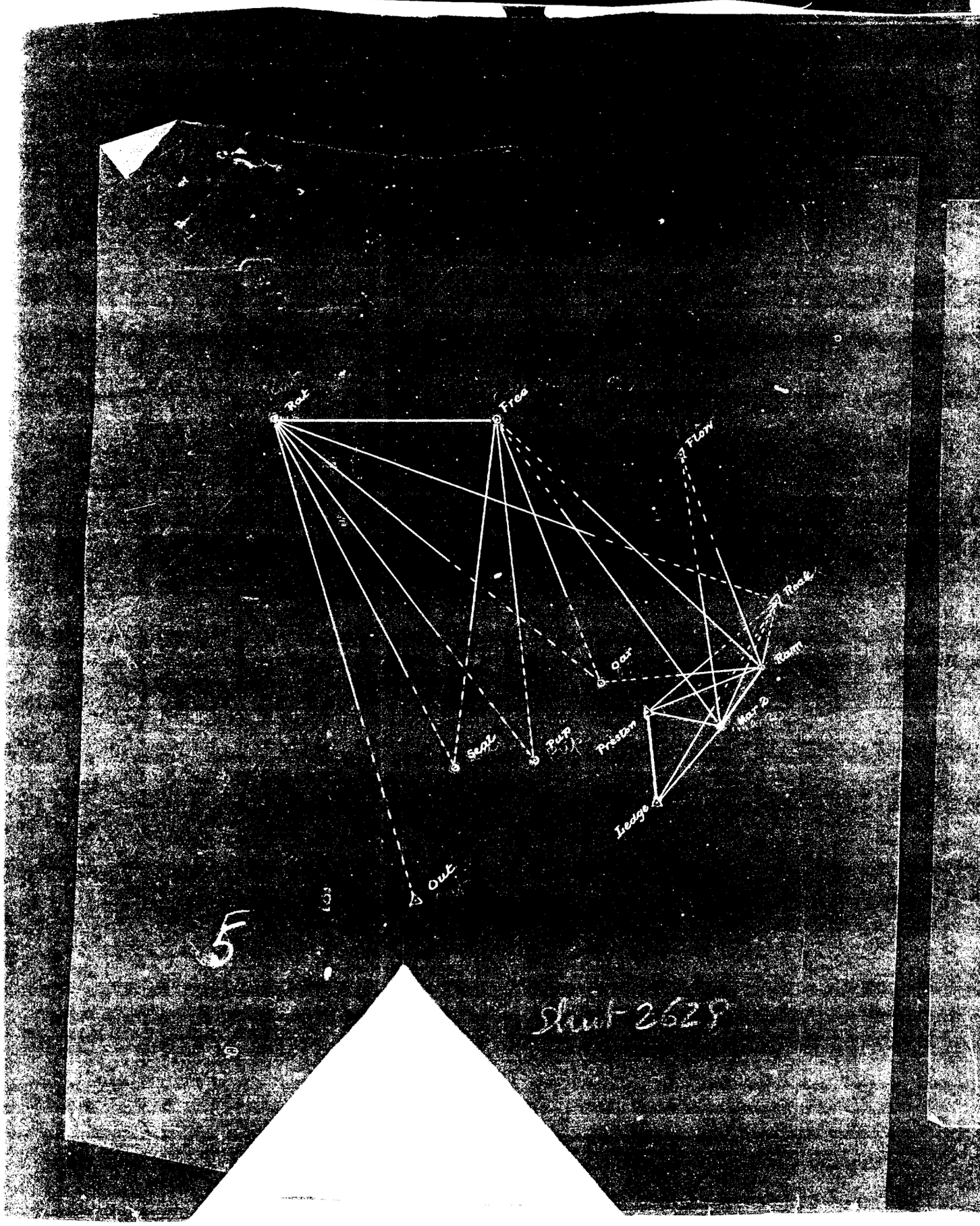
Acting Chief, Drawing and Engraving Division.


Seal and Pup Islands
Black Shoreline from Hydrographic Sheet
Shoreline from Latest Survey
Seal Island
Sketch 1


2
Ram Island
and Vicinity
Black Shoreline Hydrographic sheet
Red Shoreline Topographic sheet
Sheet 2628

3
NE Point of
Bursby Bay
Black shoreline just North
Red shoreline just South


Sheet 2628
4
Island. S.E. Entrance to
Tatitlack Narrows
Black shoreline Hydrographic sheet
Red shoreline Topographic sheet



5

Skull 2628

Mem to Assistant in Charge.

Department of Commerce and Labor

I recommend that this sheet with the appended tracing be treated as boat sheets, as per Mem. on sheet by Mr. Dunn. which see. The new sheet has the same number, 2628.

G. Bradford
Insp. Charts

U.S. Coast and Geodetic Survey.
Hydrographic
JUN 2 1905
Section.
INSPECTOR OF CHARTS.

Place in report H2628

No. 204
(Ed. 11-22-1904—500,000)

2628a

Department of Commerce and Labor

COAST AND GEODETIC SURVEY

O. H. Tittmann

Superintendent.

State: Alaska

DESCRIPTIVE REPORT.

Hyd. Sheet No. 2628a

LOCALITY:

Virginia Bay

1914

CHIEF OF PARTY:

G. T. Rude

11—4645

2628a

H. 2628[a].

Supplemental soundings showing approach to oar dock Virgin Bay, Prince William Sound, Alaska. O. K.

Sheet examined in Div. of Hydy & Topy.

D E S C R I P T I V E R E P O R T .

to accompany

Hydrographic Sheet No. 2628a

New Dock and Aerial Tramway,

Ellamar, Alaska.

Virgin Bay.

Steamer Taku, Gilbert T. Rude, Chief of Party.

September, 1914.

A new ore dock, with aerial tram connection with bunkers on shore, was erected during the Spring and Summer of 1914 just outside the reef on the west side of Virgin Bay at Ellamar, Alaska.

This sheet shows the location of this dock and the five aerial tram towers, and also the soundings in the approach to the dock out to the first red buoy, No. 4.

This work is on a scale of one to ten thousand and is controlled by the two triangulation stations "Preston" and "Ledge" and Signals "Pete", "Roof" and "Wire" located by plane table.

Only two triangulation stations were available; but a check on the work was obtained in the following way: Station Ledge was occupied with the plane table with orientation on Station Preston. At Station Ledge cuts were taken to Signals Pete, Wire, Roof, and a flag on the new dock. Then Signal Pete was occupied with plane table and located by a resection on Station Preston and cuts taken to Signals Roof, Wire, and the flag on the new dock. The flag on the new dock was then occupied with plane table and a resection made on Station Preston, which resection line checked the other two cuts previously made from Station Ledge and Signal Pete.

The plane table

The plane table work was done by party in charge of Mr. E. E. Mumaw, Deck Officer, and the sounding by the party on the Steamer Taku in charge of the Chief of Party.

The tide staff at Landlock Bay was used for the reduction of soundings. The soundings plotted on the fair sheet are in feet, reduced to the datum plane, Mean Lower Low water, as registered by the automatic tide gauge at Landlock Bay.

An ordinary handlead was used from the bridge of the TAKU for the sounding.

No tidal or other currents are noticable around this dock and landings are easily made in any weather.

For the information of the Coast Pilot Division it is stated that vessels loading ore at this dock into the amidship hatch may make either a port or a starboard landing and lie at the dock at low tide; but passenger steamers taking on ore into a forward hatch must make a starboard landing so that her sterm will project out beyond the south end of the dock rather than the north end, on account of the bank beginning with the 17 foot sounding about 75 feet north of the Northwest corner of the dock and shoaling to the Northward to five feet.

Respectfully,

Gilbert T. Rade.

Assistant, Coast and Geodetic Survey.

Statistics for Sheet No. 2628a

Date, 1914.	Letter	Vol.	Positions	Soundings	Miles(Stat)	Vessel
Septtember 24	a	1	36	105	6.1	TAKU

VEC
Mar.10,1915
L. P. A.

HYDROGRAPHIC SHEET 2628a.

Virgin Bay, Prince William Sound, Alaska, by Assistant G. T. Rude in 1914.

TIDES.

	Landlock Bay ft.
Mean lower low water, or plane of reference on staff	8.1
Lowest tide observed " "	5.7
Highest " " " "	22.4
Mean range of tide	9.6

Hyd. 2628-a

Memoranda for Title.

New Dock and Aerial Tramway,

Ellamar, Alaska.

Virgin Bay, Prince William Sound.

Steamer Taku, Season 1914.

Work done in September.

Gilbert T. Rude, Chief of Party and Hydrographer.

Topography by E. E. Mumaw, Deck Officer.

Sheet inked by field Party.

Projection by E. E. M and Checked by R. C. B.

Scale 1 : 10, 000.

Positions and soundings plotted on fair sheet by field party.

Hydrographic Sheet No. 2628a

Virgin Bay ——— Alaska.

This work was evidently made to show approach to and condition of the bottom in the immediate vicinity of the New Dar dock and for this purpose would appear good work and sufficient.

The positions were protracted by the field party and no verifications were made.

The soundings were pencil plotted by the field party and found to be correct although a few changes were made in order to conform to "General Instructions 1915".

John D. Torrey 7/8/15

Sheet plotted in fathoms.