4333

Diag. Cht. No. 1007-2, 1116-2, 1279

4333

Form 504

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

State: Louisiana + Texas

11—5613

DESCRIPTIVE REPORT.

Hydrog. *Sheet No.*(2) 4333

LOCALITY:

Gulf of Mexico

Offshore from Sabine and Heald Banks

1923

CHIEF OF PARTY:

E.R. Hand, F.S. Borden

4333

DESCRIPTIVE REPORT

TO ACCOMPANY

HYDROGRAPHIC SHEET

NO._____ (Field No.2)

APPROACHES TO SABINE PASS

AND GALVESTON

STR. BACHE

1923.

F. H. Baker
Comdg.

DESCRIPTIVE REPORT

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No. 4333 (Field No. 2)

APPROACHES TO SABINE PASS

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STR. BACHE

1923.

EXTENT.

This sheet comprises the offshore hydrography of the area between longitude 93°- 45' and longitude 94° - 15' and extending southward from latitude 29° - 22' to the twenty five fathom curve. It joins the inshore hydrography of the Steamer Hydrographer (1923) to the northward and the offshore hydrography of the Steamer Bache (1923 - 1924) to the eastward. No recent surveys have been made to the westward.

SHOALS AND BANKS.

The most important shoal in the area comprised by this sheet is Heald Bank. While no less water was found on the bank proper than has been found in previous surveys (25 feet) several shoaler soundings were obtained on the fingers protruding from the bank. The bottom in the locality of the bank is composed of hard sand and is uneven. The position of the lightship which marks the bank was found to be three miles west of its position shown on the present chart. The lightship was moved while the work was in progress to a position nearer its charted position. The position of the lightship when the party completed work in this locality was furnished under date of December 29, 1923 and is shown on the smooth sheet as signal "Heal". When wounding work was done in the vicinity of signal "H B", which was the original position of the Light Vessel, a sounding of 35 feet was obtained. Later when this sounding was investigated no trace of such a shoal could be found. The area was thoroughly sounded, the bottom found to be even, and the depth 43-45 feet. The record of the shoal sounding was investigated and it was found that the shoal sounding was the first sounding of the day, taken just at daylight. Remarks in the record showed that the sounding speed had been decreased indicating that the speed was too fast for accurate soundings. The leadsman stated that he was not sure of the first few soundings on account of the speed and poor light. In addition to the sounding lines shown on the sheet in this area additional lines were run which were not recorded. It is believed that the shoal soundings of 35-37 feet are incorrect and should not be shown on the chart.

The west end of Sabine Bank is within the area covered by this sheet. It lies on the overlap of this sheet with the inshore sheet and was

developed by the party on the Steamer Hydrographer on 1:40,000 scale. Characteristic soundings for the chart in this locality should be taken from the inshore sheet rather than from this sheet.

The shoal lying 7.0 miles 212° from Sabine Bank Light House is also on the overlap of this sheet with the inshore sheet. It was developed on this sheet and has a depth of 25 feet over it at mean low water. It lies on one of the ridges protruding from Sabine Bank and is shown on the present charts.

Two uncharted shoals lying approximately 14 miles Southwest of Sabine Bank Light House, each having 31 feet of water over it, were developed. In addition to the lines shown on the sheet other lines were run over the shoal spots to find the least depth.

In accordance with instructions the hydrographic work was carried westward to longitude 94°- 15' On the last sounding line which was very close to meridian 94°- 15' soundings less than 9 fathoms were obtained in latitude 28°-59'. It was thought at first that a new bank had been discovered but on comparison with chart No. 1280 it was seen that similar soundings were shown thereon and also that the shoal area extended several miles to the westward. Consequently no attempt was made to develop this area practically all of which lies to the westward of the work called for in my instructions.

TIDES AND CURRENTS

Tidal reducers for soundings on the sheet were obtained from observations at Galveston and also at Sabine Pass. At both of these stations tides are influenced greatly by freshets. The range of tide in the Gulf in this locality has been found to be twice the range at Galveston and 1.5 times the range at Sabine Pass under normal conditions. In obtaining the reducers curves for both stations were plotted from actual observations and the curve for the sounding area then drawn in.

Tidal observations for the reduction of soundings were not entirely satisfactory due as stated above to the effect that freshets have on the water level at both Galveston and Sabine Pass. The curves as drawn however are somewhat of a mean of the observations made at both stations and it is not believed that appreciable discrepancies enter into the reduced soundings. The time allowance used was for the critical area in the vicinity of Heald Bank and the junction between the inshore and offshore work.

Under normal weather conditions the currents are small in the area covered by this sheet. In general there is a prevailing westerly set which gradually decreases going offshore. At about the twenty fathom curve this prevailing westerly set disappears and in the vicinity of the 25 fathom curve the easterly set of the Gulf Stream is noticed to some extent.

METHODS EMPLOYED

Work on the sheet was started by Lieut. Hand in March, 1923. The methods employed by him were those prescribed in Special Publication No. 73, Precise Dead Reckoning for Offshore Hydrography. In connection with dead reckoning methods, Lieut. Hand obtained several meridian altitude sights on the outer ends of his lines. Due to the fact that his Meridian Altitude Sights invariably placed positions from two to four miles farther offshore than his positions as determined by dead reckoning he assumed that his sounding speed log factor was too small. He rerated logs on July 2 and 3 but instead of obtaining a higher factor obtained a lower one.

Command of the vessel was transferred to me on August 1 and in an endeavor to determine the cause for the large discrepancy between the positions as determined astronomically and by dead reckoning a row of buoys was planted extending from a fixed position inshore to the 20 fathom curve. Each buoy was located from the next inner buoy by a full speed run in one direction followed immediately by a full speed run in the opposite direction. Two logs were streamed and the mean taken as the distance through the water. The standard compass was read every 15 seconds and the mean used as the course steered. The closure was applied in proportion to time taken for each run.

Having located the outer buoy by this method sounding lines were run across the twenty five fathom curve in the locality where Lieut. Hand had found the discrepancy. The twenty five fathom curve was found by this method to be from two to four miles south of its position as determined by precise dead reckoning, and checked closely the astronomical latitude of the curve. Boat Sheet No. 1 accompanying Sheet No. 2 shows this discrepancy and the amounts by which the lines of Capt. Hand were adjusted on the smooth sheet.

The apparent log loss at sounding speed is undoubtedly do partly to the slip of the rotator when the vessel proceeds at speeds slower than that for which the factors were determined and partly to fouling of the rotator. log error (?) E.P.E.

To eliminate the very unsatisfactory and inaccurate results obtained by depending on a single log running at varying rates of speed and always subject to fouling, the buoy control method was adopted for all subsequent offshore work on both this sheet and Sheet No. 1.

Practically all of the work done inside of the ten fathom curve, after I took command, is fixed position work on buoys located as described above. An attempt was made at first to cut in each buoy from a fix obtained on the three buoys inshore from the one whose position was being determined. It was soon found however that this method was far less accurate than the full speed log method due to the fact that any error in base distances accumulates at a very rapid rate. Errors in the full speed log method are not accumulative but on the other hand, being of an accidental nature rather

than of a constant nature tend to counterbalance each other, provided of course that the logs are properly rated and compass deviations are well known.

When the buoy control method was adopted it was intended that outside of the ten fathom curve the buoys would simply be used to control distance offshore in order to coordinate the outer ends of the lines and that the precise dead reckoning method would be used largely in the area between the 10 and 25 fathom curves. It was soon found however that, having the buoys located, sounding lines run under favorable conditions of air and sea could be controlled more accurately by bearings on the buoys than theycould by depending on current observations. Where conditions were such that accurate bearings could be taken on the buoys the method used was as follows:

Bearings were taken every 10 or 15 minutes on each buoy as it was passed. Also a bearing was taken when each buoy was abeam. These bearings were all plotted on the sheet. When the sounding line had passed from a position abeam one buoy to a position abeam the next buoy the log distance was compared with the actual distance and a log factor obtained for the run between the two buoys. Using this log factor the true distances over the ground was computed for each run between bearings and these distances were plotted along the edge of a sheet of paper. The points on the sheet of paper were then placed on the corresponding bearings on the sheet and the line fixed. To check the positions obtained by this method the lines were tied to buoys occasionally by full speed runs.

At night or during thick weather or when the condition of the sea made it impossible to obtain accurate bearings this method could not be used and the precise dead reckoning methods were used with the exception however that the lines were controlled in their distance offshore by the buoys.

ADJUSTMENT OF P.D.R. LINES

The following method was used in adjusting the lines of Lieut. Hand the outer ends of which were foundfrom 2 to 4 miles inshore from their correct positions.

In each case the line running offshore was first plotted using the data in the abstract prepared by Lieut. Hand. This line was then drawn out sufficiently to bring the twenty five fathom curve on the curve as determined by the buoy control method and all intermediate positions were adjusted in proportion according to time. This constitued the adjustment in latitude. The return line was adjusted in latitude in the same manner. The longitude closure of the entire loop was then applied to each position in proportion to time.

Respectfully Submitted

Frank B. Borden

HYDROGRAPHIC STATISTICS, SHEET # 2 (FIELD NO. 2)

DATE, 1923.	LETTER.	VOLUME,	POSITIONS.	SOUNDINGS	MILES, Statue	VESSELS.
May 2-5	A	1	36	1141	130.0	SHIP
May 17-19	B	1 - 2	28	1085	121.0	"
May 21-	C	2	14	318	27.0	"
May 23	D	2 - 3	24	974	117.0	"
May 25	E	3	35	1073	117.0	"
May 26	F	3 - 4	17	467	33.0	"
May 26	G	4	43	242	14.0	"
June 8	H	4	31	827	99.0	"
June 28 -29	J	4 - 5	19	557	47.0	"
June 29	K	5	20	369	30.0	"
July 12	L	5	14	329	33.0	"
July 12	M	5	10	354	30.0	"
July 13	N	5	11	325	30.0	"
July 17 - 18	P	6	REJECTED.			
TOTALS, Sheet # 2, E. R. Hand, Cmndg.			302.0	8061	828.0	

HYDROGRAPHIC STATISTICS SHEET #. (FIELD NO. 2)

DATE, 1923.	LETTER.	VOLUME	POSITIONS	SOUNDINGS	MILES Statue.	VESSELS.
Aug. 27.	Q	7	4	106	8.0	SHIP.
" 28.	R	7	26	349	35.1	"
" 30.	S	7	45	543	50.6	"
" 31.	T	7	71	789	80.5	"
Sept. 5.	U	8	10	429	41.0	"
" 6.	V	8	26	585	58.6	"
" 7	W	8	10	160	31.3	"
" 11	X	8	14	356	61.0	"
" 12	Y	9	23	363	75.0	"
" 13	Z	9	18	77	16.0	"
" 14	A'	9	11	275.	34.5	"
" 18	B'	9	14	270.	22.1	"
" 19	C'	9 & 10	22	744	89.7	"
" 20	D'	10	20	321	43.0	"
" 21	E'	10	69	725	59.7	"
" 24	F'	10	20	361	55.4	"
" 25	G'	11	13	119	42.3	"
" 26	H'	11	37	215	72.0	"
" 27	J'	11	39	360	69.5	"
" 28	K'	11	10	240	28.8	"
OCT. 23	L'	11 & 12	13	482	36.4	"
" 24	M'	12	68	897	70.6	"
" 25	N'	12 & 13	58	716	59.9	"

HYDROGRAPHIC STATISTICS SHEET #2. (FIELD NO. 2)

DATE, 1923.	LETTER.	VOLUME.	POSITIONS.	SOUNDINGS.	MILES, Statue.	VESSELS.
OCT. 26.	P'	13	11	202	19.5	SHIP.
" 29.	Q'	13	18	383	30.7	"
30	R'	13	63	888	70.7	"
" 31	S'	13 & 14	42	477	35.1	"
NOV. 5	T'	14	30	360	27.0	"
" 6	U'	14	46	305	27.0	"
" 7	V8	14 & 15	81	743	46.0	"
" 8	W'	15	100	830	50.0	"
Total, Sheet #2, F.S. Borden, Comndg. -----			1032	13660	1447.0	
Total, Sheet #2, E.R. Hand, Comndg. -------			302	8061	828.0	
Grand Totals for Sheet # 2 ----------			1334	21721	2275.0	

[redacted] ✓ C.I.C.

May 8, 1924

Division of Hydrography and Topography:

Division of Charts:

Tide reducers are approved in
15 volumes of sounding records for

HYDROGRAPHIC SHEET 4388

Locality: Approaches to Sabine Pass, - Texas and Louisiana.

Chief of Party: W.H.Rand and F. S. Borden in 1923.
Plane of reference is mean low water reading
2.3 ft. on tide staff at U.S.Coast Guard Station
2.3 " " automatic gauge at Galveston.

For reduction of soundings, condition of records satisfactory
except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted.
3. Time meridian not given at beginning of day's work.
4. Time (whether A.M. or P.M.) not given at beginnding of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered wrong column.
7. Field reductions entered in "Office"column.
8. Location of tide gauge not given at beginning of each day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tubeused not stated.
11. Sounding tube No. entered in column of"Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks

E. Rand

Chief, Division of Tides and Currents.

ADDRESS THE DIRECTOR
U.S. COAST AND GEODETIC SURVEY

AND REFER TO No. 4-DRM

DEPARTMENT OF COMMERCE
U.S. COAST AND GEODETIC SURVEY
WASHINGTON October 18, 1924.

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4333

Surveyed in 1923.

Chiefs of Party, E. R. Hand and F. S. Borden.

Surveyed by Field Party.

Soundings plotted by Thos. B. Reed.

Protracted by W. D. Patterson, Frank Larner.

Inked by H. E. MacEwen.

Not verified completely (See note attached to report).

1. The records conform with the requirements of the General Instructions.

2. The plan and character of the development fulfill the requirements of the General Instructions.

3. The plan and extent of development satisfy the specific instructions.

4. Sounding line crossings were not run except in areas developed for shoals. Where shown the crossings are good (See remarks (b)).

5. The usual depth curves can be drawn completely.

6. The field plotting was completed to the extent prescribed in the General Instructions. There were some indications of carelessness in spacing of soundings by time between positions fixed by log distances or the three point fix, but the discrepancies in these cases were not serious and were easily corrected. The plotting as a whole was good.

7. The office draftsman did not have to do over any part of the field drafting.

8. The junctions with adjacent sheets are, as far as examined, satisfactory. Apparently no recent surveys completed on the western limits. North and east O. K. Transfers to be made on adjoining sheets 4332, 4334 and 4335.

9. Further surveying is not necessary to fully develop important areas within the limits of the sheet.

10. Remarks - The sheet is well laid out, the ground well covered and the limits of the hydrography regular. The soundings are well distributed and all shoals are carefully and sufficiently developed.

(b) The only doubtful crossing occurs where dead reckoning line 25 B to 26 B crosses E day line. B day line runs 3 to 4 feet shoaler causing an unnatural trend in the 10-fathom curve. Other crossings show up favorably. See also 12 J and 15 K.

(c) The sheet shows strong evidence of shrinkage longitudinally. The projection measures 3.5 meters in 1000 at 29°15' latitude to 4 meters in 1000 at 28° 40' latitude. There is slight shrinkage on the meridians but it is negligible; ranging from .6 of a meter in 1000 on the eastern limits of the sheet to 1 meter in 1000 on the western limit. These figures are approximate.

(d) No shoreline appears within the limits of this sheet.

(e) Throughout the records there appears the abbreviation "Gr" to describe the color of the bottom specimens as gray when it may easily be mistaken for green. Note: The office draftsman assumed that Gr was meant for gray.

(f) In some parts of the sheet soundings could have been eliminated without loss of important data. In many cases soundings had to be omitted in the inking because of insufficient space. This does not apply to the deeper water areas.

(g) The descriptive report does not give the date of field instructions.

(h) The geographic location of one triangulation station has not been shown on the bottom of the sheet.

11. (a) Character and scope of surveying - Excellent.

(b) Field drafting - good.

NOTE: Verification: On the recommendation of the Field Records Section the dead reckoning lines were not verified. The positions except where located by three point fix were accepted as plotted by the field party and the soundings inked.

The positions of buoys planted offshore and located by dead redkoning were also accepted as plotted in the field.

The spacing of the soundings by time between positions was verified throughout by the office draftsman.

H. E. MacEwen.
Field Records Section.

ADDRESS THE DIRECTOR
U. S. COAST AND GEODETIC SURVEY

AND REFER TO No. 4-DRM

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

WASHINGTON October 18, 1924.

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4333

Offshore from Sabine and Heald Banks.

Surveyed in 1923

Instructions dated Oct. 12, 1922, July 27 and Oct. 9, 1923.

Chiefs of Party, E. R. Hand and F. S. Borden.

Surveyed by party of Steamer BACHE.

Protracted by W. D. Patterson and F. Larner.

Soundings plotted by T. B. Reed.

Verified and inked by H. E. MacEwen.

1. The records conform to the requirements of the General Instructions. The descriptive report is unusually comprehensive. The abbreviation gr was used for bottom characteristics. Gy or gn should have been used to distinguish between gray and green. It is assumed that gray is the correct bottom.

2. The plan and character of development conform to the requirements of the General Instructions.

3. The plan and extent of the development satisfy the specific instructions.

4. The sounding line crossings are adequate.

5. The information is sufficient for drawing the usual depth curves.

6. The field plotting was completed to the extent prescribed in the General Instructions. The plotting of the ship's positions was not checked in the office as the field plotting showed evidences of skill and careful work. The plotting of soundings was verified throughout as there were numerous departures from correct spacing in the field plotting.

7. The junctions with the adjacent sheets are satisfactory.

8. No further surveying is required within the area covered by this sheet.

9. The buoy control method for offshore surveys, as developed and used by Capt. Borden on this and adjoining surveys, is evidently more accurate

than the old "precise dead reckoning" method and its use should be prescribed in all localities where the depths permit anchoring buoys.

10. The character and scope of the surveying and plotting of ships' positions are excellent. The plotting of soundings was fair.

11. Reviewed by E. P. Ellis, October, 1924.

4333

Form 537
11—5812

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

The finished Hydrographic Sheet is to be accompanied by the following title sheet, filled in as completely as possible, when the sheet is forwarded to the Office.

U. S. Coast and Geodetic Survey.

Register No. 4333 (Field No.2)

State . Texas and Louisiana . . . . . .

General locality . Gulf ~~Coast~~ of Mexico . . . . . .

Locality . ~~Approaches to Sabine Pass and Galveston, Texas.~~ Offshore from Sabine and Heald Banks .

Chief of party Eoline R. Hand and F. S. Borden. . . . . .

Surveyed by Eoline R. Hand and F. S. Borden. . . . . .

Date of survey May to November, 1923. . . . . .

Scale . . . 1 : 80,000 . . . . . .

Soundings in . Feet . . . . . .

Plane of reference . Mean low water. . . . . .

Protracted by W.D.Patterson and Frank Larner Soundings in pencil by Thos.B.Reed

Inked by . . . . . Verified by . . . . . .

Records accompanying sheet (check those forwarded):

1 Des. report, 2 Tide books, 1 cahier Tidal curves ~~Meridrams~~, 2 Boat sheets,

15 Sounding books, 2 Current ~~Wire-drag~~ books, 1 cahier P.D.R. and buoy ~~Hydrographic~~ location abstracts

1 buoy location sheet.

Data from other sources affecting sheet . . . . . .

Remarks:

Survey made by two methods:

1. Precise Dead Reckoning.
2. Bouy Control.