

5013

5012

DECLASSIFIED BY NOAA  
PURSUANT TO DOC SYSTEMATIC REVIEW  
GUIDELINES AS DESCRIBED IN SECTION  
3.3(a), EXECUTIVE ORDER 12356.

Diag. Ch. No. 5402-2

Form 504

U. S. COAST AND GEODETIC SURVEY  
DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey *Hydrographic*  
Field No. \_\_\_\_\_ Office No. *5013*

LOCALITY

State *California*  
General locality *Gulf of the*  
Locality *Farallones, S. C.*  
*Farallon I. to Noonday Pt.*  
1929

CHIEF OF PARTY

*O. H. Swanson*

LIBRARY & ARCHIVES

DATE \_\_\_\_\_

5013  
5012

B 1870-1 (1)++

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3.3(a), EXECUTIVE ORDER 12356.

# 5012

All the work on this sheet has been transferred  
to H-5213 which should be used for all purposes.

24 → SOUNDINGS IN FATHOMS  
AT MEAN LOWER LOW WATER

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3.3(a), EXECUTIVE ORDER 12356**

SOUNDINGS IN FATHOMS  
AT MEAN LOW WATER

SOUNDINGS IN FEET  
AT MEAN LOW WATER

SOUNDINGS IN FEET  
AT MEAN LOWER LOW WATER

26 Heights in feet above mean low water  
Form line interval feet 20

Heights in feet above  
Contour interval feet

24 → RECONNAISSANCE

DIAGRAMS

21 → CONFIDENTIAL

23 → Additional work

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3.3(a), EXECUTIVE ORDER 12356**

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

REG. NO. 5012

HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. 4

REGISTER NO. 5012

State ~~TERRITORY OF HAWAIIAN IS.~~

General locality ~~WESTWARD~~ Western Hawaiian Is.

Locality ~~BETWEEN GARDNER PINNACLES~~ <sup>To</sup> FRENCH FRIGATE SHOALS

Scale 1:500,000 Date of survey July 15-Sept. 28, 1929

Vessel U.S.C. & G.S.S. GUIDE

Chief of Party K. T. Adams

Surveyed by K. T. Adams

Protracted by V. M. Gibbens

Soundings penciled by J. C. Mathisson

Soundings in fathoms ~~Feet~~

Plane of reference M.L.L.W.

Subdivision of wire dragged areas by

Inked by

Verified by

Instructions dated March 26, 1928 & April 12, 1929

Remarks:

GPO

No B.S.  
1 Poo. Rept.  
(Statistical Vel Cor. etc.)  
2 Sdy Vals.  
5 Vals. U.R.

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

REG. NO. 5013

HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. 7

REGISTER NO. 5013

State California

General locality Gulf of the Farallones  
~~Northern California Coast~~

Locality S.E. Farallon Island to Noon Day Rock.

Scale 1:20,000 Date of survey June 25-Dec 5, 1929

Vessel PIONEER & MIANUS

Chief of Party O. W. Swainson

Surveyed by O. W. Swainson, and E. O. Heaton

Protracted by G. R. Fish

Soundings penciled by G. R. Fish

Soundings in fathoms feet

Plane of reference

Subdivision of wire dragged areas by

Inked by

Verified by

Instructions dated April 9, 1929

Remarks:

## DESCRIPTIVE REPORT.

TO ACCOMPANY HYDROGRAPHIC SHEET NO. 7.

### AUTHORITY

The hydrography contained on this sheet was done in accordance with instructions dated April 9, 1929 for Project No. 31

### SCALE

The scale of the sheet is 1:20,000. It is joined on the northeast by sheet 8; on all other sides by sheet 10.

### SURVEY METHODS

Three separate parties, all attached to the Ship PIONEER, worked on the sheet, the vessel doing most of it. The chartered launch MIANUS did the development around all the islands except the Southeast one. The motorsailer did the inshore work there.

The ship used the fathometer almost entirely. Some of the area to the westward of S. E. Farallon was hand-leaded and a number of vertical casts were taken to the eastward of this same island. Both the MIANUS and the motorsailer used the hand lead entirely.

### CONTROL

The control was visual fixes on the triangulation of 1859 and the previous detailed topographic survey. The S. E. Farallon Island was so well contoured that the numerous sharp pinacles could be used for signals. The accuracy of this old contouring was checked by a plane table from a tape measured base.

Several floating signals were established. All except "Tar" and "Black" were anchored boats having flags on the mast. "Black" and "Tar" were one barrel buoys. These floating signals were located by angles to Pt. Reyes Light and the Farallon Islands. Positions for locating "Noon", "Tar", and "Black", and "Whale" were plotted on Sheet 8 and transferred to Sheet 7, as signals were used which would not come on Sheet 7. The position of these signals and the hydrography controlled by them was about 150 meters eastward on the smooth sheet from that on the boat sheet. This is due to distortion of the sheet.

### TIDES

Although the instructions called for a tide staff at S. E. Farallon Island if possible, it was not found practicable to install one there. Undoubtedly a gauge could have been maintained for a short time but the danger of its being carried away was great. Hence, the gauges at Drakes Bay and San Francisco Precidio were used for the reduction of the soundings.

## COMPARISON WITH EXISTING CHART.

Soundings were transferred from the chart to the boat sheet. In the majority of cases the new work checked them very well. However, in several places, especially on Fanny Shoal, the soundings could not be checked. Usually similar or less depths were obtained nearby. It is thought that the old control was perhaps weak. The bottom over the area is so irregular that it varies considerable over small areas.

The <sup>65</sup>15 fathom spot in latitude  $37^{\circ} 47' + 750$  m., longitude <sup>950</sup> $123^{\circ} 10' + 1400$  m. was checked by vertical casts and by drifting over the spot sounding continuously with the sounding machine or dragging the lead over the bottom.

As is seen, several shoal spots were discovered to the S. ~~W.~~ of Middle Island and between Middle Island and Southeast Island. The bottom here is so irregular that ships should pass between the two islands with caution. The 5 fathom spot about one half mile S. W. of Middle Farallon was not found.

Attention is called to the discrepancy in the position of Middle Farallon Island as plotted on the survey of 1874, register sheet No. 1298 b. This might affect the position of the soundings indicating the  $5\frac{1}{2}$  fathom shoal.

A shoal with a least depth of  $6\frac{4}{6}$  fathoms was found 650 meters N  $58^{\circ}$  E of Farallon Light. A least depth of 4 fathoms was found on the eastern edge of the six fathom area 1100 m. S  $35^{\circ}$  E of Farallon Light. The six fathoms shown on the chart was not found, but seven fathoms was obtained nearby. As the launch party failed to investigate this spot properly the six fathoms should not be removed from the chart. The four fathoms is sufficient warning for vessels not to pass over or anchor on this area.

The area to the N. E. of S. E. Farallon seemed to be slightly deeper than shown on the chart. A couple of lines of vertical soundings were run over it to check the fathometer sounding. These soundings are marked "V.C.".

## NOONDAY ROCK

The motorsailer searched for a half day before they found this rock. It was attempted to drop a buoy on it and sound around the buoy, but the buoy line became fouled and the buoy drifted off the rock. However, the area was covered thoroughly and although only a least depth of  $3\frac{1}{6}$  fathoms was obtained, there might be a few feet less. The launch drifted over the area all of one day feeling the bottom with the lead. Many of the drift lines were not plotted. The rock is exceedingly small in area and has steep sides. It rises abruptly from 15 to 20 fathoms.

The position of the rock and the buoy marking it were obtained carefully by angles on Pt. Reyes Light and the Farallon Islands. The position differs slightly from that shown on the bromide of the previous survey. The position on the smooth sheet differs also from that on the boat sheet due to plotting with such distant signals.

No new landmarks were charted.

### UNSURVEYED AREA

An area between Noonday Rock and N. W. Farallon Island was not surveyed. It required exceptionally clear weather to obtain fixes here. The vessel ran to the area several times when the weather showed signs of clearing sufficiently, but the visibility remained too poor. To obtain control it will be necessary to establish one or two floating signals between Noonday Rock buoy and N. W. Farallon Island.

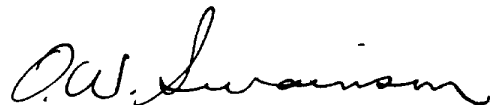
Two days should be sufficient to cover this area.

### JUNCTION OF SHEETS

The soundings at the junction of adjacent sheets check very well with the exception of an occasional one fathom discrepancy. This discrepancy is not important, as in all cases there are sufficient other soundings to prove beyond reasonable doubt which are correct. These discrepancies are due mainly to reading the fathometer. In rough seas the red light jumps over a space of several fathoms and considerable judgement is required to select the correct reading. Some readers tend to read a half fathom too high and others a half too low.

### FATHOMETER CORRECTIONS

From one to four comparisons of the fathometer were made with vertical casts each day. From these the index correction was obtained. The fathometer readings were also corrected for temperature and salinity of the water and for the distance between oscillator and microphone. For a detailed description of these corrections see hydrographic sheet No. 8 or the Season's Report. It is thought better crossings would have been obtained if instead of making the theoretical corrections the total correction was taken as the difference between the fathometer readings and vertical casts each day.



O. W. Swainson,  
Chief of Party,  
Commanding PIONEER.



LIST OF LEAST SOUNDINGS FOUND IN SHOALS DEVELOPED ON

HYDROGRAPHIC SHEET No. 7.

Shoal 1100 m. S 35° E of Farallon Light House.

<u>Position</u>	<u>Day</u>	<u>Boat</u>	<u>Sounding</u>
90 † 1 m.	f	Motorsailer	7 $\frac{1}{4}$ fms.
96 † 2 m.	f	"	4 fms.

Shoal 1900 m. N 60° W of Farallon Light House.

14	N	Pioneer	10 fms.
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Shoal 800 m. S 30° W of Middle Farallon Island

8	a	Mianus	8 $\frac{1}{2}$ fms.
16	c	"	9 $\frac{1}{2}$ fms.
11	e	"	7 fms.
25	e	"	7 $\frac{3}{4}$ fms.
34	e	"	6 $\frac{5}{6}$ fms.
36	e	"	6 $\frac{1}{2}$ fms.

Shoal 650 m. N 58° E of Farallon Light House

4	f	Mianus	6 $\frac{4}{6}$ fms.
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Shoal 300 m. S 45° E of North Farallon South Islet.

78	d	Mianus	1 $\frac{1}{2}$ fms.
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Noonday Rock Shoal

$\frac{3}{4}$  mi. N 65° W of North Farallon North Islet.

56	b	Motorsailer	3 $\frac{1}{6}$ fms. - Position of Rock.
2	c	"	4 $\frac{4}{6}$ fms.
39	E	Pioneer	11 fms.

STATISTICS FOR SHEET NO. 7.

Date	Day	Vol.	Pos.	Soundings		Miles	Remarks	
				F.R.	Machine L.L.			
1929								
June 25	A	1	32	171		8.8	PIONEER	
July 30	B	1	91	353		39.2	"	
	31	C	17	4			"	
Aug. 1	D	1	100	495		34.5	"	
	2	E	2	94	433	29.0	"	
	15	F	2	51	231	22.0	"	
	16	G	2	53	227	14.5	"	
	27	H	2	12	91	5.9	"	
Sept. 26	J	2	83	333		50.0	"	
	27	K	3	104	542	50.5	"	
Oct. 4	L	3	188	836		81.5	"	
	15	M	3 & 4	141	646	69.5	"	
	31	N	4	79	321	22.5	"	
	8	a	1A	62	107	10.6	MIANUS	
	9	b	1A	74	150	13.0	"	
	15	c	1A	38	58	21	4.9	"
	16	d	1A	88	159	6	11.0	"
	17	e	1A	125	98	138	16.2	"
	18	f	2A	40	63	6	6.9	"
July 31	A	1a	68				MOTORSAILER	
Aug. 1	B	1a	92	110		8.3	"	
	2	C	1a	46	61	4.9	"	
	23	D	1a	50	49		"	
Oct. 2	E	1a	58		140	10.7	"	
	4	F	1a, 2a	99	304	17.5	"	
Dec. 5	-	2a	34		159	1.6	WHALEBOAT	

1919 4683 843 774 533.7  
 243  
 774  
 6300

SHEET NO. 7.

The following is a list of soundings at sheet junctions that appear to be doubtful. *All soundings are from Sheet No. 10.*


Soundings from position 46K to 47K

"	"	"	2M - 44.
"	"	"	62NN- 37
"	"	"	36NN- 39
"	"	"	25PP- 26PP.
"	"	"	2PP- 30, 31, 30, 30.
"	"	"	39PP- 37, 37, 36.

REPORT OF COMMANDING OFFICER'S INSPECTION  
OF RECORDS AND SHEETS.

Sheet 7 and its records have been examined and approved by me. Each individual record was not examined thoroughly, but all doubtful entries found by the officers who plotted the positions and soundings were investigated. The officers had been instructed to examine the records closely as they plotted the smooth sheet and report any entry that might be an error.

I examined the junction of the sheets by plotting the soundings of the smaller scale on a tracing of the ~~of the~~ same scale as the larger scale sheet. Then by placing this tracing over the larger scale sheet I could compare the soundings. The discrepancies were then encircled, examined, and notes made as to which was in probable error. I did not reject them in the sounding records, however, unless the discrepancy was more than two fathoms. I did not check the plotting.



O. W. Swainson,  
Chief of Party,  
Commanding PIONEER.

POST-OFFICE ADDRESS: Honolulu, T. H.

TELEGRAPH ADDRESS:

EXPRESS OFFICE:

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

SHIP PIONEER.

March 23, 1931.

To: The Director,  
U.S. Coast & Geodetic Survey,  
Washington, D. C.

From:m The Commanding Officer,  
U.S.C. & G.S.S. PIONEER.

Reference: Letter of February 27, 1931, No. 10-AM.

Subject: Rocks in Fisherman's Bay, S. E. Farallon Island.

*H. 5013*  
The following additional information in regard to  
the rocks in Fisherman's Bay, S. E. Farallon Island, is herewith  
supplied.

Pos.	Symbol	Reduced Sndgs. (Fathoms)	REMARKS
Pos. 16	A	5 2/6	Large sunken rock 15 m. on Port beam, <i>+</i> <u>inshore</u> , under less than 1 fathom.
Pos. 19-20	B	3 1/2	Shoal sounding on Point of rocky shoal. <i>3 1/2</i>
Pos. 20-21	C	1 1/6	Rocks covered 1 to 6 feet a few meters <i>+</i> inshore of this sounding.
Pos. 22-23	D	2	Uneven rocky bottom. <i>no additional sds required</i>
Pos. 32-33	E	1	Shoal sounding on rock. <i>RK</i>
Pos. 19-20	F	1/2	Bare rocky area just ahead from Pos. 20. <i>1 m. inshore</i>

The same information has been noted on the Photostat furnished  
at the time of your letter and is being returned with this letter.

*File in des. report*

*Information applied*

*608*

*+*

*3 1/2*

*+*

*no additional sds required*

*RK*

*1 m. inshore*

*Above information applied*

*608*

O. W. Swainson

O. W. Swainson,  
Lieut. Commander, C. & G. S.,  
Commanding PIONEER.

11  
*Capt. Ellis*

10-AM

February 27, 1931.

To: The Commanding Officer,  
 U. S. Coast and Geodetic Survey,  
 Ship PIONEER,  
 5th Floor, Aloha Tower,  
 Honolulu, T. H.

From: The Director,  
 U. S. Coast and Geodetic Survey.

Subject: Rocks in Fisherman Bay, S. E. Farallon.

With reference to your hydrographic sheet 5015 (Field No. 7), covering locality shown above, additional information is desired relative to the positions of rocks indicated by notes in the "Remarks" column of the sounding record.

The table below shows the information desired. The "Symbol" column refers to letters shown on a photostatic copy of a section of the sheet, which is being forwarded to you under separate cover.

The sounding records show that Mr. Healy was in charge of the party and taking right angle. Mr. Gilmore was taking left angle and recording. The work was done on December 5, 1929.

Pos.	Symbol	Reduced Sounding	Exact wording of note in Remarks Column	Additional information required for correct representation.	Remarks
Pos. 16	A	5 2/3	15 meters from large rock	Bare, wash, sunken direction	Approximately
Pos. 18-20	B	5 1/2	Rock	Bare, wash, sunken distance & direction from fix.	Five feet of tide at the
Pos. 20-21	C	1 1/6	Rocks	Do	time the
Pos. 22-23	D	2	Rocks	Do	lines were
Pos. 23-25	E	1	Rock	Do	run.
Pos. 19-20	F	1/2	Rock Ahead	Bare, wash, sunken distance.	

(Signed) H. S. Pether  
 Director.

ecm  
rae

**FOR THE FILES OF THE FIELD RECORDS SECTION**

**May 23, 1930**

Division of Hydrography and Topography:

✓ Division of Charts:

Tide Reducers are approved in  
8 volumes of sounding records for

HYDROGRAPHIC SHEET **5012 5013**

Locality: **California (Farallon Islands)**

Chief of Party: **W. S. Saminson in 1929**

Plane of reference is **mean lower low water, reading**  
ft. on tide staff at **Pt. Reyes**

**3.8** ft. below B. M. **1**  
**17.0**

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 beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks.

*W. S. Saminson*  
Chief, Division of Tides and Currents.

Field Records Section (Charts)

HYDROGRAPHIC SHEET No. 5013

The following statistics will be submitted with the cartographer's report on the sheet:

Number of positions on sheet	.....	1919
Number of positions checked	.....	778
Number of positions revised	.....	19
Number of soundings recorded	.....	6300
Number of soundings revised	.....	176
Number of signals erroneously plotted or transferred	.....	.....

*{ Large Number due to erroneous fractional values*

Date: Feb - 3<sup>rd</sup> 1931  
Cartographer: John Fleming



AND REFER TO No. 82-DRM

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
WASHINGTON

SECTION OF FIELD RECORDS

Review of Hydrographic Sheet No. 5013

Surveyed in 1929

Chief of Party, O. W. Swainson  
Surveyed by O.W.S. and E. O. Heaton  
Protracted by G. R. Fish  
Soundings plotted by G.R.F.  
Verified and inked by J. Fleming

1. The records conform to General Instructions except as follows:
  - (a) Approximate positions of beginning and ending of sounding line frequently omitted.
  - (b) Notes on line turnings often omitted.
  - (c) 'B' day, Vol. 5, plotted as 'b' day on smooth sheet.
  - (d) Instructions relative to plotting of fractional depth units ignored or misunderstood.
  - (e) Notes in record, Vol. 6, Fisherman's Bay, regarding rocks are indefinite. None of the rocks was plotted and there is no boat sheet for this part of the work.
  - (f) Signal Can used at pos. 77 e (Vol. 7) just east of  $\Delta$  Nor is not listed and not shown. No doubt it is the signal 60 m. southeast of  $\Delta$  Nor.
  
2. The plan and character of the development fulfill the requirements of General Instructions except between Middle Farallon and North Farallon where the area as a whole is sparsely sounded. Two spots are conspicuous about 1 1/2 miles south of North Farallon.  
  
Failure to develop the area west of North Farallon is satisfactorily explained in the Descriptive Report.
  
3. The specific instructions have been complied with but the distances between sounding lines in some cases exceed that called for in paragraph 21 by two times the amount, or even more. The nature of the formation necessitates rather close development.

4. Sounding line crossings are considered satisfactory even though there are differences of two fathoms. This judgment is based upon the fact that differences of 2 and 3 fathoms between consecutive soundings on the same line have been observed on this and adjoining sheets - indicating a "rugged" bottom. The "saw tooth" nature of the formation is indicated in the development of some of the shoals, where coincident sounding lines with good control have soundings which appear to be superimposed yet differ as much as 4 fathoms. In such cases only the shoaler soundings were plotted.
5. The usual depth curves can be completely drawn.
  - (a) Junctions with adjacent sheets are satisfactory, considering the uneven nature of the bottom.
6. The field plotting was satisfactory and considering the difficulties presented by weak control on 'e' and 'f' days, Vols. 5 and 6 around Southeast Farallon the field plotting may be considered excellent. In this connection it must be stated that the weak control had the effect of producing an extraordinary number of "swingers" on the days referred to, necessitating the plotting of the locus of the point for the separate angles constituting the fix for each position.

The control governing the positions which define the shoal with least depth of 4 fms. southeast of Southeast Farallon was so weak that it had to be enlarged four times and the steps given in the preceding paragraph followed. The plotted points were then reduced by pantograph and transferred to the sheet.

7. It is felt that in subsequent surveys of the area southeast of Southeast Farallon, a floating signal should be established in order to break up the succession of "swingers" which is bound to occur by the use of the present control.
8. The plotting of every position involved in the definition of the shoal in lat.  $37^{\circ}43'.2$ , long.  $123^{\circ}02'.0$  on the smooth sheet by the field party resulted in an excessive perforation of the sheet and tended to defeat the purpose of the overlays, two of which (covering this shoal) accompanied the sheet.
9. It is thought that the latter part of the 5th paragraph, page 2, of the Descriptive Report is subject to modification for the reason that the 6 fms. referred to plots between the 4 and the  $6\frac{4}{6}$  on the south. But it is considered important to note that there is also a  $6\frac{1}{2}$  fms. 250 meters southwest of the 6 fms. on 1298 c and near which spot a  $7\frac{1}{4}$  fm. sounding was obtained on this survey. It is thought that the 4 fms. should replace the 6 fms. on the chart.

10. Comparison with previous surveys:

- (a) The erroneous position of A Mid Farallon on H. 1298b as recorded in the Descriptive Report is verified. The records for that survey have been obtained and the 5 1/4 fms. plotted on the present sheet using the original angles and triangulation control. Its true position is about 60 meters southeast of the position on H. 1298b and is in the center of a 10 fm. spot surrounded by 8 3/4 fms. and 9 1/4 fms. and 10 fms.
- (b) A number of critical soundings from H. 1298b southeast of the 5 1/4 fms. seem to be from 1 to 2 fms. shoaler than those obtained at approximately the same points in this survey.
- (c) There are soundings on the northeast and southwest sides of this rocky ridge (area of 5 1/4 fms.) which by their contrast with adjacent soundings appear menacing.
- (d) A number of indications along the ridge northwest of Southeast Farallon and the rugged character of the bottom, leads to the conclusion that only the wire drag can remove all doubt concerning the existence of dangers in that area.
- (e) The 8 fms. from H. 721 (chart 5402) directly west of Seal Island is verified by similar soundings in this survey, but the area to the west (vicinity of 7 1/2 fms., this survey) and south (vicinity of 13 fms. and 12 fms., long. 123° 01') is less certain than before. It is felt that the 7 1/2 fm. sounding warranted a further development of the point of the 10 fm. curve.
- (f) The bank in approx. lat. 37°45'.6, long. 123°07'.0 with least depth of 22 fms. confirms the bank with 27 and 29 fms. on the chart, but it is not clear why it was not developed unless the area slightly to the north, H. 5013, with relatively close development was mistaken for it. It seems that the 22 fms. was not considered of sufficient importance, or was overlooked.

For source of 2 1/4 fms. on Noonday Rock, chart 5402, see Notice to Mariners No. 4, 1875. (See note on margin of H. 721.)

- (g) None of the 23 fm. soundings shown on H. 721 running (four in a row) 320°20' true from Noonday Rock is confirmed in this survey.
- (h) The sheet character of the rock surface is indicated directly west of Noonday Rock (long. 123°11') where a difference of 21 fms. is noted in a horizontal distance of 30 meters.

11. Remarks:

- (a) The bottom in this area is rugged and the sides of practically all shoals are sheet, therefore unusual significance should be attached to all indications.

- (b) When the area to the west of  $\Delta$  Nor is surveyed it is recommended that the bank (22 fms.) discussed under paragraph 10 (f) above, be further developed and also the area in the vicinity of the 7 1/2 fms. in lat.  $37^{\circ} 41'.6$ , long.  $123^{\circ} 00'.95$ .
- (c) The work is considered very good.

12. Reviewed by John Fleming, February 5, 1931.

Inspected by E. P. Ellis

Approved:

*(Signed) A.M. Sobieralski*  
Chief, Section of Field Records

*F.S. Borden*  
Chief, Section of Field Work

