6006

Form 504
Rev. Dec. 1933

DEPARTMENT OF COMMERCE
U.S. COAST AND GEODETIC SURVEY
R. S. PATTON, DIRECTOR

DESCRIPTIVE REPORT

~~Topographic~~
Hydrographic Sheet No. H (T-5001) 6006

State California

LOCALITY

Sacramento River

~~Rio Vista to~~ Georgianna Slough

1934

CHIEF OF PARTY

Lieut. L. P. Raynor

U. S. GOVERNMENT PRINTING OFFICE: 1934

6006

Form 537
Ed. Sept., 1929

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO. 6006

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. H (T-5001)

REGISTER NO. 6006 6006

State CALIFORNIA

General locality SACRAMENTO RIVER

Locality ~~RIO VISTA TO~~ GEORGIANNA SLOUGH

Scale 1:10,000 Date of survey Feb. March, April, 1934

Vessel HELEN F (Leased Launch)

Chief of Party L. P. Raynor

Surveyed by L. P. Raynor

Protracted by George C. White A.H.Y.

Soundings penciled by George C. White A.H.Y.

Soundings in ~~fathoms~~ feet

Plane of reference M.L.L.W.

Subdivision of wire dragged areas by

Inked by A. Yeomans

Verified by A.Y.

Instructions dated September 2, 193~~4~~ 3

Remarks:

U. S. GOVERNMENT PRINTING OFFICE 1929

DESCRIPTIVE REPORT

of

HYDROGRAPHIC SHEET H (T-5001)

AUTHORITY, LIMITS, DATES:

The instructions for this work are contained in the following letters:

1. 22LE 1990 March 17, 1933
2. 22AHH 1990 August 12, 1933
3. SUPPLEMENTAL INSTRUCTIONS PROJECT 98HT Sept. 2, 1933
4. 26RS 1990 November 9, 1933
5. 22AHH 1990 November 16, 1933
6. 22MEN 1990 December 2, 1933

This sheet covers Georgianna Slough and Mokelumne River. Georgianna Slough terminates in the Mokelumne River. Most of the work was carried out in February and March and a small portion in April, 1934.

GENERAL NOTES:

Along the Mokelumne River the levees have been built up from material dredged from the adjacent waterway. This is quite evident from the depth along the east shore. The rest of the waterway has a fairly even bottom of hard sand with the shoalest water along the west shore and the deepest water at the mouth of the Georgianna Slough. The shoal water along the west shore ends opposite ME6, about 400 meters from the southern end of the tule island.

Georgianna Slough has natural steep high banks, with a hard bottom in midstream and soft mud along both shores. The bottom is fairly deep and even, except on curves where natural erosion and silting occurs. This slough is effected by flood waters, and has a distinct hydraulic gradient extending throughout its length, from the source at the Sacramento River, to the mouth at the Mokelumne River. During the whole time that hydrography was in progress in Georgianna Slough the current ran from the Sacramento River towards the Mokelumne River with no reversal of current during flood tide. This was noticed by the sounding party, as well as by the tide observer at the staff opposite the Golden State Asparagus Cannery at the junction of the Georgianna Slough and Mokelumne River. The current is due, at least during flood tide, to the hydraulic gradient between the Sacramento and Mokelumne Rivers.

Mr. Stafford, State Water Supervisor of Sacramento-San Joaquin Delta, stated that the flow of water is always from the Sacramento River into the Mokelumne and thence to the San Joaquin River, except during the very lowest stages of the Sacramento River. The latter occurs in dry season, usually in August, when there is a flood tide, a short period on a rising tide when the current reverses itself and flows north through the Georgianna Slough.

This information should be of some value to users of this stream as it is suggested for Coast Pilot use.

The banks of the Georgianna are grown over with an abundance of trees and shrubs, except at the lower end where the growth overhangs the stream about 3 or 4 meters on each side. This heavy growth caused considerable discrepancy in the photo-compilation work, and the shore line shown on the smooth sheet is, for the most part, the brush line.

SURVEY PARTY:

The waterways on this sheet were surveyed by ~~xxxxx~~ N. G. Korneeff, Observer, ~~xxxxx~~ with usual duties in charge of launch and Plotting; George C. White, Left angle, Bearings with Pelorus, shore distances with range finder #7277; Chas. M. Anstead, Right angle, and Range Finder Readings with range finder H8; C. Kester, Recorder; Myron Bear and John Logan alternating as Leadsman and Coxswain. N. G. Korneeff, Observer, was in charge of the launch for most of the work in Georgianna Slough.

SURVEY METHODS:

A. The signals for control of the work were located by the following methods:

1. Signals along the Mokelumne River and at the mouth of Georgian~~n~~a Slough were located by using Whatman's Print T5001 as a planetable sheet and rodding in the signal from some well defined object on the sheet. (See note on boat sheet T5001.) See later notes

2. Spotting directly on the smooth sheet from topographic detail, ie., intersection ditch lines with high water line, gables of buildings, windmills, and other prominent land marks.

3. Sextant angles and stadia measurements. These locations are to be found in Vol. 1, p. 1 and 2.

B. Boat positions were obtained either with the sextant three point fix or by use of range finder H8 and bearings by compass #24874 using pelorus 24874. Three point fixes were used almost entirely in the Mokelumne River work. This was impossible in Georgian~~n~~a Slough. The boat positions were determined by bearings and distances. Simultaneous shore distances were taken frequently with C. M. Anstead using range finder H8 and reading starboard shore and G. C. White using range finder #7277 and reading port shore.

The simultaneous shore distances were taken to the high water line while the center line was being sounded. This was done to discover if the shore line from photo-compilation was in error and also to determine the boat position relative to the center of the stream.

In plotting on the smooth sheet it was found that the distance between high water lines as shown by photo-compilation on Georgian~~n~~a Slough is less by about 10 meters than the distance shown by the simultaneous range finder readings.

Whenever simultaneous range finder readings were taken to the existing brush line, the distance checked the distance between the supposed high water lines on the smooth sheet. The topographic party found the same result and erected the signals on the brush line to conform with the photo-compilation work. Therefore, it is safe to say that the high water line as shown by photo-compilation is actually the brush line except in a few places where the banks are void of growth.

In plotting the shore lines on the smooth sheet a smooth curve was drawn between fixes conforming with the high water line, shown on smooth sheet, at a distance off relative to the distances off shown by the fixes.

Range finder readings between fixes to determine the distance of the boat off shore could not be used because all distances were taken from the boat to the actual high water line, which is not shown by the photo-compilation work. However, the sounding lines are plotted in their true position relative to the fixes since the signals are located in their true position on the smooth sheet from their position in the field.

An additional sounding line will be found on a tracing. lost - replotted by A.H.Y. This line was run with the current and about 12 meters off the west shore. When travelling with the current a bucket was lowered from the stern of the launch. This kept the speed of the boat within reason and made the steering of the boat much easier. There was considerable difficulty in handling the boat on turns due to eddies and whirls that prevailed. The latter is the result of the velocity of the water and the great quantity of submerged growth along the banks.

The deviations of the compass were determined by using range #3, San Joaquin River and three point fix to Andrus Island Steel Tower, taking bearings on every 15° of Rhumb. The following determinations for compass deviation were used on this sheet:

Date	Range	Magnetic Bearing
December 14, 1933.	#3 San Joaquin River	312°
February 15, 1934	Three pt. fix to Andrus Id. Steel Tower, S. Fork, Mokelumne River	212°

The deviation table and total compass error may be found on page 1, Vol. 1 and on the back fly leaf of Vol. 1, and page 1, Vol. 2.

Range finder H8 was calibrated and used as follows:

Date of Calibration	Days used	Observer
February 23, 1934.	D, E, F, G, AND H.	Chas. M. Anstead

Range finder #7277 was calibrated and used as follows:

Date of Calibration	Days Used	Observer
February 9, 1934	A	L. P. Raynor
February 20, 1934	B & C	Chas. Anstead
February 20, 1934	F, G, & H	Geo. White
April 3, 1934	J	Chas. Anstead

Note: On F, G, & H days range finder #7277 was used for shore distances only, on the other days it was used both for determining boat positions and taking shore distances. Range finder H8 was used only for determining boat positions on F, G, & H days and for both boat positions and shore distances on D & E days. As before range finder readings above 50 were avoided when possible since these readings are not reliable.

C. Depths were obtained by leadline or sounding pole. The sounding pole was a 4 fathom pole and used up to 3½ fathoms. All soundings were read to the nearest tenth of a foot. In the sounding volumnes, soundings were reduced to the nearest ½ ft. and plotted to the nearest ½ ft. up to 10 ft. and the nearest foot over 10 ft. as authorized by the instructions of December 2, 1933.

ANCHORAGES AND LANDINGS:

There are few wharves in the locality of this sheet, and boats and barges would have considerable difficulty making fast alongside the bank of the Georgianna Slough due to the overhanging growth. There is a ferry opposite the county road near GE25 on Georgianna Slough and should be indicated as danger to navigation as it is impossible to pass while the ferry is operating, due to the cable that is stretched across the stream. When the ferry is on the east shore, the stream is also blockaded by a string of buoys that tend to keep the ferry in a straight line across the slough. In order to pass, the ferry must be on the west shore and the ferryman should be signaled to release the tension on the cable allowing it to sink in the water.

On Georgianna Slough there is a landing at the Golden State Cannery. While there are no landings on this portion of the Mokelumne, it is possible to make fast quite easily to the row of piling on the east shore. This is not so on the west shore.

SHOALS, WRECKS, AND SNAGS:

There is a shoal along the west shore extending from MW9 to MM6. This shoal varies in depth from 0 to 7 ft. Between MM8 and MM6 it extends about forty to fifty meters towards the center of the stream. There is a snag 1 meter off shore opposite the second sounding before the position 35H and is indicated on the smooth sheet. Other snags plotted as indicated in the bottom char. column of records.

CHANNELS:

All the waterways on this sheet are used for navigation, both by pleasure craft and commercial vessels. The pleasure craft draw from $1\frac{1}{2}$ ft. to 4 ft. while tugs and barges draw from 4 ft. to 9 ft. The controlling depth in Georgian~~n~~a Slough is 13 ft. and is located at the junction of Georgian~~n~~a Slough with the Mokelumne River. The channel depths in the Mokelumne River vary from 1 to 5 fathoms and are indicated by depth curves on the boat sheets.

GW 5

TIDAL DATA:

Tide reducers for work on the Mokelumne river and a portion of Georgian~~n~~a Slough as indicated on the boat sheet were compiled from data recorded by a tide observer at the State Tide Staff, opposite the Golden State Asparagus Cannery. However, tide reducers for work done on February 12 were obtained by using a 15-minute correction on the gage at Terminous.

Tide reducers for the portion of Georgian~~n~~a Slough north of the zone taken care of by the State Staff were obtained by using the hydraulic gradient from Walnut Grove to the Mokelumne River. The hydraulic gradient was determined by tide records recorded simultaneously at Walnut Grove Drawbridge Staff and the staff opposite the Golden State Cannery. This was done by two tide observers.

The plane of reference is MLLW and is 2.5 on the staff opposite the Golden State Cannery and 2.7 on the staff at the Walnut Grove Drawbridge. The tide records were reduced to height above the reference plane and a hydraulic gradient was drawn between the two staffs 10.5 miles apart for various time intervals during the time hydrography was being carried out. The gradient was drawn as a straight line between the staffs with the abscissa as distance and the ordinates as water height above the reference plane. The boat sheet was divided into mile intervals as zones for the reducers and the reducers were computed accordingly by interpolation from the various gradients throughout each day.

The highest tide observed at Walnut Grove was 7.8 on the staff and occurred March 1, 1934; the lowest tide was 6.1 on the staff and occurred March 5, 1934. The highest tide recorded by the

Stevens Automatic Gage opposite Golden State Cannery was 6.9 ft. on the staff and occurred January 13 and 14, 1934. The lowest tide was 2.1 ft. and occurred January 24, 1934.

All tide data including observers records, tabulations, hydraulic gradients, and level records, have been sent to you.

GEORGIANNA GAGE
TIDE REDUCER

1.7 to 2.2	add	½	foot
2.2 to 2.7	zero		
2.7 to 3.2	subtract	½	foot
3.2 to 3.7	"	1	"
3.7 to 4.2	"	1½	"
4.2 to 4.7	"	2	"
4.7 to 5.2	"	2½	"
5.2 to 5.7	"	3	"
5.7 to 6.2	"	3½	"
6.2 to 6.7	"	4	"

In entering reducers use plus sign if reducer is additive, but no sign is needed if reducer is to be subtracted.

CHANGES TO SHEET T-5001:

Break in tule island at ~~MH~~ MM 8 was changed. Error in photo-compilation was discovered from planetable work in that vicinity.

LANDMARKS:

Copy of a list of landmarks on form 567 is attached to this report and a further copy has been mailed under separate cover. The objects with (3) are useful in local navigation only, ie., for help in determining the camp near which one is passing or the exact location in an adjacent slough. The objects with (2)(3) are for the most part power line poles and can be seen from a considerable distance. None of these landmarks appear on this sheet. It is suggested, however, that the landmarks listed should be placed on the chart (new) of the Delta, if space permits.

George C. White
George C. White
Draftsman.

REVISION OF SHEET H (T-5001)

H6006

After the above report was written an error in photo-compilation was discovered while comparing the junction of T-5001 with T-4686. The windmill at Denicke Landing (MW 4-5001 and MW 1-T4686) used for three point-fixes in hydrography on both sheets was considerably out of position. This necessitated a complete topographic revision of the junction of the two sheets including all the shoreline of the Mokelumne River on T-5001, a portion of Georgianna Slough, and the shoreline on the Mokelumne River down as far as the first bend on T-4686. The "Windmill", Denicke Landing, was located by measurement from a theodolite three-point fix on levee nearby. The latter was used as a control for topography. It should be noted that both tank and windmill were located similarly but the windmill only was used in hydrography.

Formerly, the topography on 5001 was carried out on a Whatman's print, so distorted that the entire work was of no value. The final topographic revision was made on an aluminum sheet.

All hydrographic work affected by this topographic revision was replotted and a comparison of the junction with T-4686 compared favorably. There were no variations in soundings common to both sheets. The shoreline affected by topography was redrawn on the smooth sheet.

A list of the planetable positions of the signals will be found in the report accompanying the topographic aluminum sheet for this area. (T 5001a)

George C White
George C. White
Draftsman

approved 9/2/34
L S Raynor
Chief of Party

SHEET 5001 H6006

Statistics

Date		Day	Vol.	Miles	Soundings	Positions	Signals
Feb.	12	A	1	1.50	107	20	
"	20	B	1	1.10	61	10	
"	21	C	1	2.00	181	20	
"	26	D	1	1.10	72	9	
"	27	E	1	1.10	66	10	
"	28	F	1	4.60	330	48	
Mar.	1	G	1	4.90	469	31	
"	5	H	1 & 2	15.80	890	86	
Apr.	4	J	2	2.80	322	40	
		Totals		34.90	2498	274	50

Field Records Section (Charts)

HYDROGRAPHIC SHEET No. 6006

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

Number of positions on sheet	274
Number of positions checked	4
Number of positions revised	0
Number of soundings recorded	2498
Number of soundings revised	5
Number of signals erroneously plotted or transferred	0

Date: ~~[illegible]~~ JAN. 24, 1934

32 hrs. Cartographer: A. H. YEOMANS

Plotting + Pencilling Soundings by A.H.Y. 6 hrs

Verification of protracting
Verification & inking of rocks & shoals) by A.H.Y. Time: 21 hrs

Verification of inking by A.H.Y. Time:

Review by [signature] Time: 9 hrs.

LAC

September 24, 1934.

Division of Hydrography and Topography:

Division of Charts:

Tide Reducers are approved in
2 volumes of sounding records for

HYDROGRAPHIC SHEET 6006

Locality Rio Vista to Georgiana Slough, San Joaquin Delta, Calif.

Chief of Party: L. P. Raynor in 1934
Plane of reference is mean lower low water, reading
2.5 ft. on tide staff at Georgiana Slough
10.6 ft. below B. M. 1
3.6 ft. on tide staff at Terminous
7.7 ft. below B.M. 5
2.7 ft. on tide staff at Walnut Grove
20.1 ft. below B.M. 1

The reducers for soundings in Georgiana Slough were applied in accordance with the hydraulic gradient between Walnut Grove and Golden State Cannery near the Mokelumne R.

Height of mean higher high water above plane of reference is approximately 3.8 ft.

Condition of records satisfactory except as noted below:

Paul C. Whitney
Chief, Division of Tides and Currents

Survey No. H-6006
T-5001

GEOGRAPHIC NAMES

Date. Dec. 7, 1934

Chart No.

HMS

Names approved Dec. 7, 1934. H. Bacon

Diagram No.

*, Approved by the Division of Geographic Names, Department of Interior.

¢, Not Approved by the Division of Geographic Names, Department of Interior.

R, Referred to the Division of Geographic Names, Department of Interior.

Status	Name on Survey	Name on Chart	New Names in local use	Names assigned by Field	Location
	*Sacramento River	U.S.G.B.			
	*Cache Slough	All maps agree			
	*Steamboat Slough	"			
	Grand Island	"			
	Ida Island	"			
	Rio Vista	"			
	*Georgiana Slough	"			
	*Mokelumne River	"			
	*Bouldin Island	"			
	*~~Tyler~~ Island	"			
	Andrus Island	"			
	Brannan Island	"			
	Twitchell Island	"			
	*Tomato Slough	"			
	*Jackson Slough	"			
	*Smith Slough	"			
	Ball Slough	"			
	*Sevenmile Slough	"			
	*Duck Island OK HB				
	*Vormans Landing O.K. HB Isleton	U.S.Postal Guide,1934			
	* To be added to this sheet. For placing of names, see notations in red pencil on revision copy of T-5001.				
NOTE:	----For references consulted see DR for T-4685. HMS. (Geographic names in DR verified) HMS				

(M 100)

Report on H 6006

Surveyed in Feb-April 1934

Chief of party L.P. Raynor

Surveyed by L.P.R.

Protracted by George C. White, A.H.Y.

Soundings plotted by G.C.W. + A.H.Y.

Verified + inked by A.H. YEOMANS

1. The records conform to the requirements of the General Instructions.
2. The usual depth curves were completely drawn.
3. The field plotting was completed to the extent prescribed in the Hydrographic manual with the exception that positions 54-86 red H day were only plotted on tracing paper which was lost before the sheet was verified.
4. The office draftsman did no drafting over that had been done by the field party.
5. The junction with sheet H 6005b (1933-34) was made and found to be satisfactory. The junction with sheet H 6010 could not be made as this sheet is not completed.
6. The positions 54-86 H were plotted on the smooth sheet but only a few of the soundings which added to the information on the sheet could be plotted. ~~the clearance of the bridge at G.W. 30 could not be located.~~

Submitted by,

A.H. Yeomans

Section of Field Records.

REVIEW OF HYDROGRAPHIC SURVEY NO. H-6006 (1934)

Georgiana Slough, Sacramento River, California
Surveyed in 1934
Instructions dated March 17, 1933, L. P. Raynor
September 2, 1933, L. P. Raynor.

Hand Lead and Pole Soundings.

3 Point Control on Shore Signals
Range Finder Distances
Compass Bearings using Pelorus.

1. Condition of Records.

The records are neat, legible and conform the requirements of the Hydrographic Manual with the following exceptions:

a. No list of signals used was noted in the records.

b. There was no evidence that the plotting of signals was checked since no initials were shown on the sheet pertaining to the checking. This was accomplished in the office.

2. Compliance with Instructions for the Project.

The plan, character and extent of the survey satisfy the instructions for the project.

3. Sounding Line Crossings.

The cross lines in the Mokelumne River are satisfactory. No cross-lines were run in Georgiana Slough due to the narrowness of the stream.

4. Depth Curves.

The usual depth curves may be satisfactorily drawn within the limits of the survey.

5. Junctions with Contemporary Surveys.

a. The junction with H-6005b (1933-34) on the south is satisfactory.

b. The junction with H-6010 (1933-34) on the east will be considered in the review of H-6010 (1933-34)

6. Comparison with Prior Surveys.

There are no prior surveys by this Bureau within the limits of the present survey.

7. Comparison with Chart.

There is no chart covering the area of the present survey.

8. Field Plotting.

The field protracting and plotting were accurate and conform to the requirements of the Hydrographic Manual except as follows:

a. In plotting the smooth sheet nearly all of the snags mentioned in the sounding volumes were omitted. They have been added to the smooth sheet in the office.

9. Additional Field Work Recommended.

No additional field work is recommended.

10. Superseding Old Surveys.

There are no previous surveys within the limits of the present survey to be superseded.

11. Reviewed by - Leo S. Straw, February 6, 1935.

Inspected by - A. L. Shalowitz.

Examined and approved:

Chas. K. Green, C. K. Green
Chief, Section of Field Records.

L. O. Colbert
Chief, Division of Charts.

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

G. T. Rude
Chief, Division of H. & T.

Applied to drawing of Chart 5527
Feby. 27, 1935 - J.F.W.