

9678

Diag. Cht. No. 1271 & 1273-2

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Topographic

Field No. Ph-90 Office No. T-9678

LOCALITY

State Louisiana

General locality Louisiana Coast

Locality Hackberry Bay

1952-56

CHIEF OF PARTY

E.H.Kirsch, Chief of Field Party

H.C.Applequist, Tampa Photo. Office

LIBRARY & ARCHIVES

DATE February 26, 1959

6-1870-1 (1)

9678

DESCRIPTIVE REPORT - DATA RECORD

T - 9678

Project No. (II): **24200**

Quadrangle Name (IV):

Field Office (II): **Houma La.**

Chief of Party: **E. H. Kirsch**

Photogrammetric Office (III): **Tampa Fla.**

Officer-in-Charge: **H. C. Applequist**

Instructions dated (II) (III):
5 Sept. 1952
25 Sept. 1952 (Supplement # 1)
30 Sept. 1952 (Supplement # 2)

Copy filed in Division of
Photogrammetry (IV)

Method of Compilation (III): **Graphic**

Manuscript Scale (III): **1:20,000**

Stereoscopic Plotting Instrument Scale (III): **Inapplicable**

Scale Factor (III): **None**

Date received in Washington Office (IV): **12-21-56** Date reported to Nautical Chart Branch (IV): **1-16-57**

Applied to Chart No.

Date:

Date registered (IV): **12-1-58**

Publication Scale (IV):

Publication date (IV):

Geographic Datum (III): **N.A. 1927**

Vertical Datum (III):

Mean sea level except as follows:
Elevations shown as (25) refer to mean high water
Elevations shown as (5) refer to sounding datum
i.e., mean low water or mean lower low water

Reference Station (III): **Hackberry 3, 1934**

Lat.: **29° 23' 19." 807 (609.8m)** Long.: **90° 03' 20." 347 (548.7m)**

Adjusted
ORBITAL

Plane Coordinates (IV):

State:

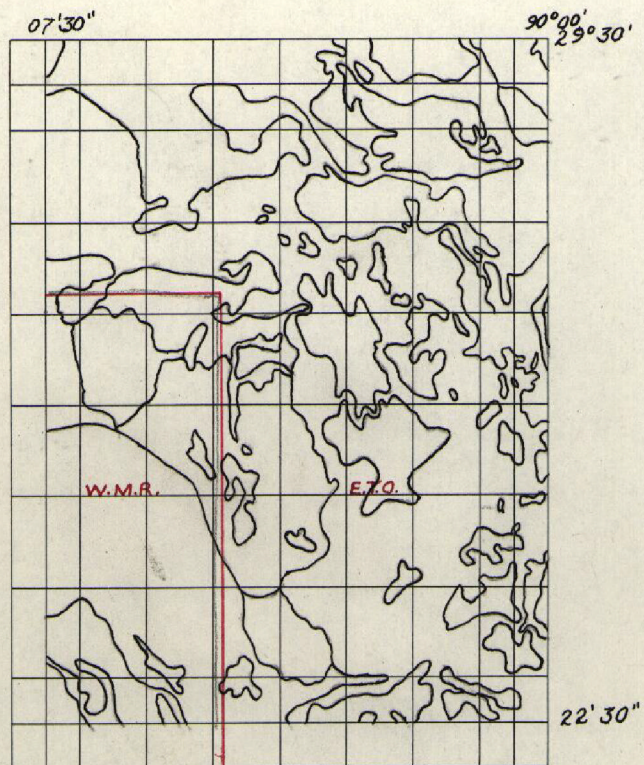
Zone:

Y=

X=

Roman numerals indicate whether the item is to be entered by (II) Field Party, (III) Photogrammetric Office,
or (IV) Washington Office.

When entering names of personnel on this record give the surname and initials, not initials only.



Areas contoured by various personnel
(Show name within area)
(II) (III)

DESCRIPTIVE REPORT - DATA RECORD

Field Inspection by (II): **E. T. Ogilby**
W. M. Reynolds

Date: **Jan. 1953**
Jan. 1953

Planetable contouring by (II): **E. T. Ogilby**
W. M. Reynolds

Date: **Jan. 1953**
Jan. 1953

Completion Surveys by (II):

none!

Date:

Mean High Water Location (III) (State date and method of location): **Jan. 1953 Air Photo Compilation**

Projection and Grids ruled by (IV): **Austin Riley (W.O.)**

Date: **28 Aug. 1953**

Projection and Grids checked by (IV): **H. D. Wolfe (W.O.)**

Date: **3 Sept. 1953**

Control plotted by (III): **R. R. Wagner**

Date: **19 Oct. 1954**

Control checked by (III): **R. J. Pate**

Date: **20 Oct. 1954**

Radial Plot ~~contouring~~

Date: **17 May 1956**

~~contouring~~ by (III): **M. M. Slavney**

Planimetry

Date:

Stereoscopic Instrument compilation (III):

Inapplicable

Contours

Date:

Manuscript delineated by (III): **I. I. Saperstein**

Date: **Dec. 1956**

Photogrammetric Office Review by (III): **J. A. Giles**

Date: **Dec. 1956**

Elevations on Manuscript

checked by (I) (III): **J. A. Giles**

Date: **Dec. 1956**

DESCRIPTIVE REPORT - DATA RECORD

Camera (kind or source) (III): **C&GS 9-lens and U.S. Navy Single-lens**

PHOTOGRAPHS (III)

Number	Date	Time	Scale	Stage of Tide
39550	29 Sept. 1952	10:41	1:20,000	0.4
39551	" " "	10:42	"	"
MDA-23-036	8 March 1952	--	"	--
MDA-20-152	7 March 1952	--	"	--
MDA-20-153	7 March 1952	--	"	--

Single-lens photography:
 56-W-4114 to and incl. 4119 23 Oct. 1956 1:30 000
 56-W-4124 " " " 4128 " "
 56-W-4193 " " " 4197 " "
 56-W-4228 " " " 4232 " "

Tide (III) **Predicted**

Diurnal

Reference Station: **Pensacola**
 Subordinate Station: **Manila, Barataria Bay**
 Subordinate Station:

Ratio of Ranges	Mean Range	Range
-	-	1.3
0.3	-	1.0

Washington Office Review by (IV): *J.J. Streifler*

Date: *Sept. 1958*

Final Drafting by (IV):

Date:

Drafting verified for reproduction by (IV):

Date:

Proof Edit by (IV):

Date:

Land Area (Sq. Statute Miles) (III): **56**
 Shoreline (More than 200 meters to opposite shore) (III): **72**
~~Shoreline (Less than 200 meters to opposite shore) (III):~~
 Control Leveling - Miles (II): **None**
 Number of Triangulation Stations searched for (II): **33**
 Number of BMs searched for (II): **14**
 Number of Recoverable Photo Stations established (III): **4**
 Number of Temporary Photo Hydro Stations established (III): **None**

Recovered: **9**
 Recovered: **14**

Identified: **9**
 Identified: **14**

Remarks:

Summary
to accompany topographic map T-9678

This is the northeastern most topographic survey of Ph-90 (6090). The area is directly west of BARATARIA BAY in the vicinity of HACKBERRY BAY in the State of Louisiana near the Gulf of Mexico.

The land area is practically all marsh and only two small five-foot contours are shown. There are no roads within the limits of this sheet and cultural features are confined to a few cabins and such objects as are associated with the exploration and development of oil. This activity is mostly in the southeastern portion of this quadrangle (Hackberry Bay area).

Along with other sheets of this project, consisting of topographic and planimetric maps, T-9678 was compiled in 1955 from photography of 1952 and results of field inspection of 1953. The compilation manuscript was revised in 1957 from 1956 single-lens photography without benefit of additional field inspection or completion survey. Changes were applied from adequate photography by office interpretation only at the Tampa District Office. This field office submitted as the final map manuscript a positive obtained from an appropriately scribed sheet with the addition of vegetation stickup and type.

Hydrographic information will be added to a copy of the map manuscript according to U. S. Geological Survey specifications and released to that agency for the publication of a standard $7\frac{1}{2}$ minute quadrangle at the scale of 1:24000. A previous quadrangle without contours of identical area (BAY DOSGRIS, LA.) by the G. S. of 1935 at the scale of 1:31680 will then become obsolete.

A Cronar film positive at manuscript scale of 1:20000 and the Descriptive Report, as well as a print in colors after final printing by G. S. will be registered and filed in the Bureau Archives.

Sept. 1958

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2. AREAL FIELD INSPECTION

The area embraced by this map is marsh except for short stretches of shell beach and some fast ground in the western section. This fast ground composes the old natural levees of bayous that have since filled themselves in.

There is considerable trapping, shrimping, and oyster fishing in this area. The area also has numerous oil wells and the oil field workers are the only year round inhabitants.

See Field Inspection Report, Quadrangle T-9882() for a general description of the conditions in local oil fields.

The photographs are clear. The field inspection is believed to be complete and adequate.

The field work was done on the following photographs, nine-lens: 39549, 39550, 39551, and Navy single-lens ratio prints MDA-20-151 through MDA-20-154, MDA-23-036, and MDA-23-038.

3. HORIZONTAL CONTROL

No supplemental control was established.

The following Coast and Geodetic Survey Stations were reported lost: HACKBERRY 1877; HACKBERRY 2 1911; BUG 1934; SUN 1934; 2ND PLATFORM CHIMNEY 1911; TREE 1934; BUR 1934; DUFONT 1877; GRAND BAYOU 1877; FLAG IN TREE NO.2 1877; COFFEE 1877; POT 1934; BLACK AND WHITE FLAG 1877; ST. DENIS 1877; ST. DENIS 2 1911; CHANGE 1877; FLAG IN TREE (CUTLERS CHENIERRE) 1877; BAYOU CUTLER ENTRANCE LT. 1934; SER 1934; DEN 1934;

4. VERTICAL CONTROL

Vertical control consists of tidal bench marks. All existing ones were recovered. They are as follows: LITTLE LAKE TIDAL BENCH MARK NO 1, 2, and 3; MANILLA VILLAGE TIDAL BENCH MARK NO 1, 2, 3, 4, and 5; HACKBERRY BAY TIDAL BENCH MARK NO.1, 2, and 3; BAYOU ST DENIS TIDAL BENCH MARK NO.1, 2, and 3.

See Paragraph 5 for discussion of vertical control for contouring.

5. CONTOURING AND DRAINAGE

As practically the entire area is marsh, there is ^{little} ~~no~~ relief in the quadrangle. Spot elevations were established at widely spaced intervals, according to the project instructions. Vertical control for the contouring was obtained by establishing tide staffs at the various tidal bench marks. The staffs were read and the water elevations recorded. Hand level methods were used to obtain spot elevations, using the water level as datum. These were recorded on the field photographs and reduced to half tide level from the tide staff record. The tide staffs used in various areas have been indicated on the photographs.

The drainage is all tidal and is easily discernible on the photographs.

6. WOODLAND COVER

Woodland coverage consists of small areas of trees, on the fast ground, which have been indicated on the field photographs.

7. SHORELINE AND ALONGSHORE FEATURES

All shoreline is apparent except for small shell beaches.

The mean low water line is contiguous with the mean high water line.

There is a house boat docked in a slip that is dredged in the island in the center of Hackberry Bay. This house boat remains in the oil field but it has been moved since photography and may be moved again. It has been deleted and the field editor is cautioned not to assume this house boat is in a permanent location.

8. OFFSHORE FEATURES

Adequately covered by the photographs. Piling were located by planetable methods using well and platforms identifiable on the photographs as control.

The Texas Company has supplied a list of positions for the wells in Bayou de Chene Field but some wells do not exist, either because they were dry or not drilled. The existing wells were identified on the field photographs.

9. LANDMARKS AND AIDS

All landmarks and aids are reported on Forms 524 and 567.

10. BOUNDARIES, MONUMENTS AND LINES

See "Special Report, Boundaries, Project Ph-90" and "Special Report, Public Land Lines, Project Ph-90".

11. OTHER CONTROL

One landmark and three aids to navigation have been located as recoverable topographic stations and have been reported on Form 524.

12. OTHER INTERIOR FEATURES

There are a number of trappers cabins which have been indicated on the photographs. Due to lack of cultural features these are landmarks in themselves and should be mapped as Class 1 buildings.

The Texas Company Map No. 130633, Gas Line, Golden Meadow to Bayou St. Denis, shows route of a pipeline crossing the area from west to east. This pipeline has been identified on the photographs.

13. GEOGRAPHIC NAMES

See "Special Report, Geographic Names, Project Ph-90."

14. SPECIAL REPORTS AND SUPPLEMENTAL DATA

Letter of Transmittal No. 90-5, Forms 567, to be forwarded to Washington Office at a later date.

Letter of Transmittal No. 90-6, Forms 567, to be forwarded to Photogrammetric Office at a later date.

Letter of Transmittal No. 90-7, "Special Report, Public Land Lines, Project Ph-90" and other land lines data, forwarded to Washington Office 29 April 1953.

Letter of Transmittal dated 28 January 1953, Public Land Lines data forwarded to Washington Office, same date.

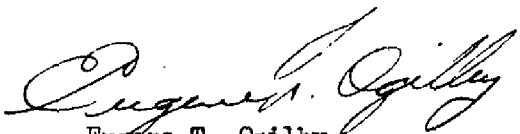
Letter of Transmittal No. 90-8, "Special Report, Geographic Names, Project Ph-90", to be forwarded to Washington Office at a later date.

Letter of Transmittal No. 90-9, "Special Report, Boundaries, Project Ph-90", forwarded to Washington Office 6 May 1953.


Two (2) sheets, Bay de Chene Field, positions of wells, The Texas Company Map No. 130633, 8" Gas Line, Golden Meadow to Bayou St. Denis, The Texas Company, forwarded to Washington Office with data for quadrangle T-9676.

Letter of Transmittal No. 90-31, Data, Quadrangle T-9678(),
forwarded to Washington Office MAY 14 1953

Submitted
13 May 1953


Eugene T. Ogilby
Cartographic Survey Aid

Approved & Forwarded
MAY 14 1953


E. H. Kirsch
Chief of Party

SCALE FACTOR

1 FT = 3048006 METER	DATE 10/22/53	CHECKED BY: J. Steinberg	DATE 11/4/53	COMM-DC-57843
COMPUTED BY: B. Wilson				

12
11

COMPILATION REPORT T-9678

PHOTOGRAMMETRIC PLOT REPORT

Submitted with T-9865

31. DELINEATION

The graphic method was used.

The field inspection was adequate and no difficulty was encountered in the delineation.

The northern two minutes of the manuscript was compiled from the U.S. Navy single-lens ratio prints because of lack of coverage of nine-lens photographs.

It was possible in certain areas of the manuscript to obtain two-cut intersections only on detail points, because of lack of photograph coverage. These areas are in the northern and eastern parts of the manuscript. However the detail is believed to be within the limits of accuracy. These two-cut intersections are shown with green ink on the manuscript.

Only those oil wells shown on the photographs were delineated (see Item 8). It will be noted however that all the oil wells were plotted using the positions given by the Texas Co. The wells were then located photogrammetrically in an effort to check the radial plot. Some wells checked the plotted position and others did not. It was learned however that the positions given by the Texas Company were those of reference points and not necessarily those of the actual Wells.

32. CONTROL

Reference Photogrammetric Plot Report.

33. SUPPLEMENTAL DATA

The Texas Company Map of the 8" Gas Line, scale 1:20,000 dated August 1948.

The bearings and distances given on this map check the radial plot position of the pipe lines.

34. CONTOURS AND DRAINAGE

The field inspection has given numerous spot elevations throughout the sheet but only one contour was shown.

35. SHORELINE AND ALONGSHORE DETAILS

The mean-high-water line was delineated according to the photographs and the field inspector's notes. All alongshore detail has been shown on the manuscript. The shoals were shown according to the

field inspector's notes. (See field photograph 39550). Shoreline inspection was adequate.

36. OFFSHORE DETAILS

All offshore details, mostly wells and platforms, have been shown. (See Item 8).

37. LANDMARKS AND AIDS

There are three fixed aids to navigation located on shore, for which Forms 524 have been submitted. A radio tower has been recommended for charting as a landmark.

38. CONTROL FOR FUTURE SURVEYS

See Item 11. A list of recoverable topographic stations has been prepared and listed under Item 49.

39. JUNCTIONS

A junction has been made with T-9677 to the west. No contemporary survey to the north. A junction will be made with T-9867 to the south after field edit. No contemporary survey to the east, but a junction with U.S.G.S. Quadrangle Wilkinson Bay, scale 1:31,680, 1935 was attempted. Due to the natural erosion of the shoreline since 1935, it was impossible to obtain a junction. The detail was shown about 1.5 cm past the neat line in accordance with the Topographic Manual 5414.

40. HORIZONTAL AND VERTICAL ACCURACY

See Item 31 concerning two cut intersections.

41. BOUNDARIES

The parish line was drawn according to a map prepared by J. A. Lovell, using bearings and distances shown thereon instead of the description as given in the Boundary Report. It will be noted that the distances given on the Lovell map do not put the parish line in the center of Grand Bayou in some instances, although the description does so.

The field editor should determine if possible, the correct position of the line.

1
15

The courts, it will be noted in the boundary report, adjudged the Lovell map an accurate, true and correct survey. However, the ruling is being appealed.

42. PUBLIC LAND LINES

Public Land Lines were shown using three sources: (1) G.L.O. plats, (2) U.S.G.S. Quad BAY DOSGRIS, and (3) The Texas Co. 8" Pipe Line. The Texas Co. map was used in controlling the section lines. A point was given on the pipe line that tied down the range line between R23E and R24E. The map being relatively late and the same scale as the manuscript, section lines in T20S R23E were shown by holding control and common detail.

Sections 37 and 38 were taken from U.S.G.S. Quad, there being no bearings and distances given on the G.L.O. plats with the exception of Section 37 in T19S R23E. In this particular section, a difference occurs between the G.L.O. plat and the Quad. (See Section Line Discrepancy Print).

In other areas of the manuscript the G.L.O. plats were used.

46. COMPARISON WITH EXISTING MAPS

Comparison has been made with BAY DOSGRIS Quadrangle 1:31,680 edition of 1935; and Planmetric Map T-5300, 1:20,000, edition of 1934.

Both maps compare favorably with the manuscript except for natural erosion of the shoreline and some islands and the addition of man-made detail.

47. COMPARISON WITH NAUTICAL CHARTS

Comparison has been made with C&GS Chart 1273, 1:80,000 edition of Jan. 1937, revised to 5 Sept. 1955.

The maps listed in Item 46 were probably the sources of topography for the chart. The same differences exist between the chart and the manuscript.

ITEMS TO BE APPLIED TO NAUTICAL CHARTS IMMEDIATELY

None.

ITEMS TO BE CARRIED FORWARD

None.

I. I. Saperstein
I. I. Saperstein
Carto Photo Aid

Approved and Forwarded:

H. C. Applequist
H. C. Applequist
Chief of Party

T-9678.Geographic Names.Alombro Cemetery (new name, not previously reported)Bay de Chene Oil Field (see note below)Bay DoggrisBayou Casse-teteBayou CholasBayou DefondBayou CutlerBayou DoggrisBayou St. DenisCoffee BayCoffee BayouCreole BayCreole PassEast Fork Bayou l'OursGrand BayouHackberry BayJefferson ParishLittle LakeLive Oak BayLouisianaManila BayouManila Village Oil Field (from 1955 Jefferson Parish Highway Map)Mud LakeOld Grand BayouSt. Joseph BaySnail BaySnail Bayou

Names approved Jan. 16, 1957

L. Heck *L.H.*

While there is no objection to using "The Texas Company", the U.S.G.S. in the new 1955 quads of SW Louisiana (also MRC quads) use only the name of the oil field and do not give the names of the operating companies. The same applies to the newest USGS quads in Texas.

PHOTOGRAMMETRIC REVIEW BRANCH

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

MONITORING AND INSPECTION LANDMARKS FOR CHARTS

TO BE CHARTED

STRIKE OUT ONE

Tampa Florida

11 Dec. 1956

I recommend that the following objects which have ~~(inserted)~~ been inspected from seaward to determine their value as landmarks be charted on ~~(inserted)~~ the charts indicated.

The positions given have been checked after listing by I. I. Saperstein

H. C. Applequist Chief of Party.

STATE	LOUISIANA	CHARTING NAME	DESCRIPTION	SIGNAL NAME	POSITION						METHOD OF LOCATION AND SURVEY No.	DATE OF LOCATION	HARBOR CHART	INSHORE CHART	OFFSHORE CHART	CHARTS AFFECTED
					LATITUDE *		LONGITUDE *									
					D. M. METERS	"	D. M. METERS	"	D. P. METERS	"						
R. TR.	The Texas Co. Bay deChene Field			29 24	10.33	90 02	13.20	N.A. Radial Plot	1927 T-9578	1953	X				1050 1273	
	Steel skeleton Radio Tower				3.0		356									
	ht. 196 (196)															

This form shall be prepared in accordance with Hydrographic Manual, pages 800 to 804. Positions of charted landmarks and *nonfloating* aids to navigation, if redetermined, shall be reported on this form. The data should be considered for the charts of the area and not by individual field survey sheets. Information under each column heading should be given.

PHOTOGRAMMETRIC OFFICE REVIEW

50.

T-9678

1. Projection and grids J.G. 2. Title J.G. 3. Manuscript numbers J.G. 4. Manuscript size J.G.
unclassified
1a. Classification label _____

CONTROL STATIONS

5. Horizontal control stations of third-order or higher accuracy M.M.S. 6. Recoverable horizontal stations of less than third-order accuracy (topographic stations) J.G. 7. Photo hydro stations XX 8. Bench marks J.G.
9. Plotting of sextant fixes XX 10. Photogrammetric plot report J.G. 11. Detail points J.G.

ALONGSHORE AREAS

(Nautical Chart Data)

12. Shoreline J.G. 13. Low-water line XX 14. Rocks, shoals, etc. J.G. 15. Bridges J.G. 16. Aids to navigation J.G. 17. Landmarks J.G. 18. Other alongshore physical features J.G. 19. Other along-shore cultural features J.G.

PHYSICAL FEATURES

20. Water features J.G. 21. Natural ground cover J.G. 22. Planetable contours J.G. 23. Stereoscopic instrument contours XX 24. Contours in general J.G. 25. Spot elevations J.G. 26. Other physical features J.G.

CULTURAL FEATURES

27. Roads XX 28. Buildings J.G. 29. Railroads XX 30. Other cultural features J.G.

BOUNDARIES

31. Boundary lines J.G. 32. Public land lines J.G.

MISCELLANEOUS

33. Geographic names J.G. 34. Junctions J.G. 35. Legibility of the manuscript J.G. 36. Discrepancy overlay XX 37. Descriptive Report J.G. 38. Field inspection photographs J.G. 39. Forms J.G.
40. William A. Rasure for William A. Rasure
Jesse A. Giles Reviewer Supervisor, Review Section or Unit

41. Remarks (see attached sheet)

FIELD COMPLETION ADDITIONS AND CORRECTIONS TO THE MANUSCRIPT

42. Additions and corrections furnished by the field completion survey have been applied to the manuscript. The manuscript is now complete except as noted under item 43.

William H. Shearouse W. H. Shearouse
Compiler Supervisor

43. Remarks:

Review Report of
Topographic Map T-9678
September 1958

62. Comparison with Registered Topographic Surveys:

T-5300 1:20,000 1934

Numerous changes have occurred since the survey of 1934, mainly additional canals and construction of oil wells with accompanying piling, piers and platforms. T-9678 is to supersede T-5300 for nautical charting purposes of common areas.

63. Comparison with Maps of Other Agencies:

BAY DOSGRIS, LA. 1:31680, 1935, U. S. Geological Survey.

Changes listed under item 62 apply also to this quadrangle of identical time period.

64. Comparison with Contemporary Hydrographic Surveys:

None

65. Comparison with Nautical Charts:

1273	1:80,000	Revised to 58 3/3
1050	1:175000	Revised to 57 2/25

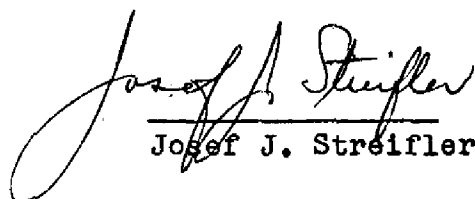
Agreement between subject survey and listed nautical charts is good. 1956 single-lens photography used in the revision of T-9678 was applied to the larger-scale nautical chart as well. The chart of 1:175000 scale compares as good as scale difference permits.

*note difference in shoreline
ø 29°30'
λ 90°07'*

66. Adequacy of Results and Future Surveys:

Results of 1956 single-lens photography was applied to the original compilation manuscript by office interpretation only--without benefit of field inspection or field edit. The photography appears adequate for such revision, which is believed to be adequate and accurate.

Reviewed by:


Josef J. Streifler

L.C. Landy

Chief, Review & Drafting Sec.
Photogrammetry Division

Max Skulotto

Chief, Nautical Chart Branch
Charts Division

R.W. Swanson

Chief, Photogrammetry Div.

20 February 1959 ^{MS}

J.H. Russell

Chief, Coastal Surveys

49. NOTES FOR THE HYDROGRAPHER

The following are recoverable topographic stations for which Form 524 have been submitted:

Bayou St. Denis Lt. 7, 1953

Bayou St. Denis Lt. 13, 1953

Bayou Cutler Entrance Lt. 1953

Radio Tower, 1953

TIDE COMPUTATION

PROJECT NO. Ph. 90 T. 9678

Time and date of exposure 1041 29 Sept 1952

Reference station

Pensacola

Diurnal Mean range 1.0

Date of field inspection Jan. 1953

Subordinate station

Manilla, Barataria Bay

Ratio of ranges 0.3

	Time	
	h.	m.
High tide	7	32
Low tide	20	25
Duration of rise or fall	12	53

	Height		Height x Ratio of ranges
	feet		
High tide	1.7	✓	0.5
Low tide	0.3	✓	0.1
Range of tide			0.4

	Time	
	h.	m.
High tide at Ref. Sta.	6	42
Time difference	+	0 50
Corrected time at Subordinate station	7	32

	Time	
	h.	m.
Low tide at Ref. Sta.	18	00
Time difference	+	2 25
Corrected time at Subordinate station	20	25

	h.	m.	feet	feet	Photo. No.
Time H. T. or L. T.	7	32	0.5	Feature bares	39550
Required time	10	41	0.1	Stage of tide above MLW	
Interval	3	09	0.4	Feature above MLW	
Time H. T. or L. T.				Feature bares	
Required time				Stage of tide above MLW	
Interval				Feature above MLW	
Time H. T. or L. T.				Feature bares	
Required time				Stage of tide above MLW	
Interval				Feature above MLW	
Time H. T. or L. T.				Feature bares	
Required time				Stage of tide above MLW	
Interval				Feature above MLW	
Time H. T. or L. T.				Feature bares	
Required time				Stage of tide above MLW	
Interval				Feature above MLW	
Time H. T. or L. T.				Feature bares	
Required time				Stage of tide above MLW	
Interval				Feature above MLW	

Computed by 115 Checked by PPM

