H10572

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

DESCRIPTIVE REPORT

Type of Survey: Hydrographic
Side Scan Sonar

Field No.: MI-20-1-94

Registry No.: H-10572

LOCALITY

State: Louisiana

General Locality: Gulf of Mexico

Sublocality: 12 NM South of Calcasieu Pass

19 94

CHIEF OF PARTY
CAPT N. A. Prahl

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DATE: MAR 18 1997

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NOAA FORM 77-28
(11-72)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

REGISTRY NUMBER:

H-10572

HYDROGRAPHIC TITLE SHEET

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

FIELD NUMBER: MI-20-01-94

State: Louisiana

General locality: Gulf of Mexico

Locality: 12 ~~Nautical Miles~~ N/M South of Calcasieu Pass, LA

Scale: 1: 20,000 Date of survey: 21 Aug - 09 Nov, 1994

Instructions dated: 26 July 1994 Project Number: OPR-K171-MI-94

Vessel: NOAA Ship MT MITCHELL S-222

Chief of Party: CAPT Nicholas A. Prahl, NOAA

Surveyed by: J.A. Ferguson, J.A. Mann, T. Duffy, M.P.M. Soracco, J.D. Swallow, S.R. Williams, S.A. Shaulis, E.J. Van Den Ameele, E.J.Sipos, U.L. Gardner, P.G. Lewit, M.J. Annis, L.A. Butler, M.T. Lathrop, and E.R. Yniguez.

Soundings taken by echo sounder, hand lead-line, or pole: DSF 6000N fathometer

Graphic record scaled by: MT MITCHELL personnel

Graphic record checked by: MT MITCHELL personnel

Protracted by: N/A Automated plot by: ENCAD NOVAJET III / Zeta 936 Plotters (FIELD)

Verification by: Hydrographic Surveys Branch

Soundings in: Feet: ✓ (HSB) Fathoms: _____ Meters: (*) (FIELD) at MLW: _____ MLLW: (*) :

Remarks: Basic Hydrographic Survey including AWOIS #8766 and #6989..

200% side scan sonar coverage of safety fairway and fairway anchorages.

Time zones used: +0 (UTC) for data collection and +0 (UTC) for tidal data.

NOTES IN RED WERE MADE DURING OFFICE PROCESSING

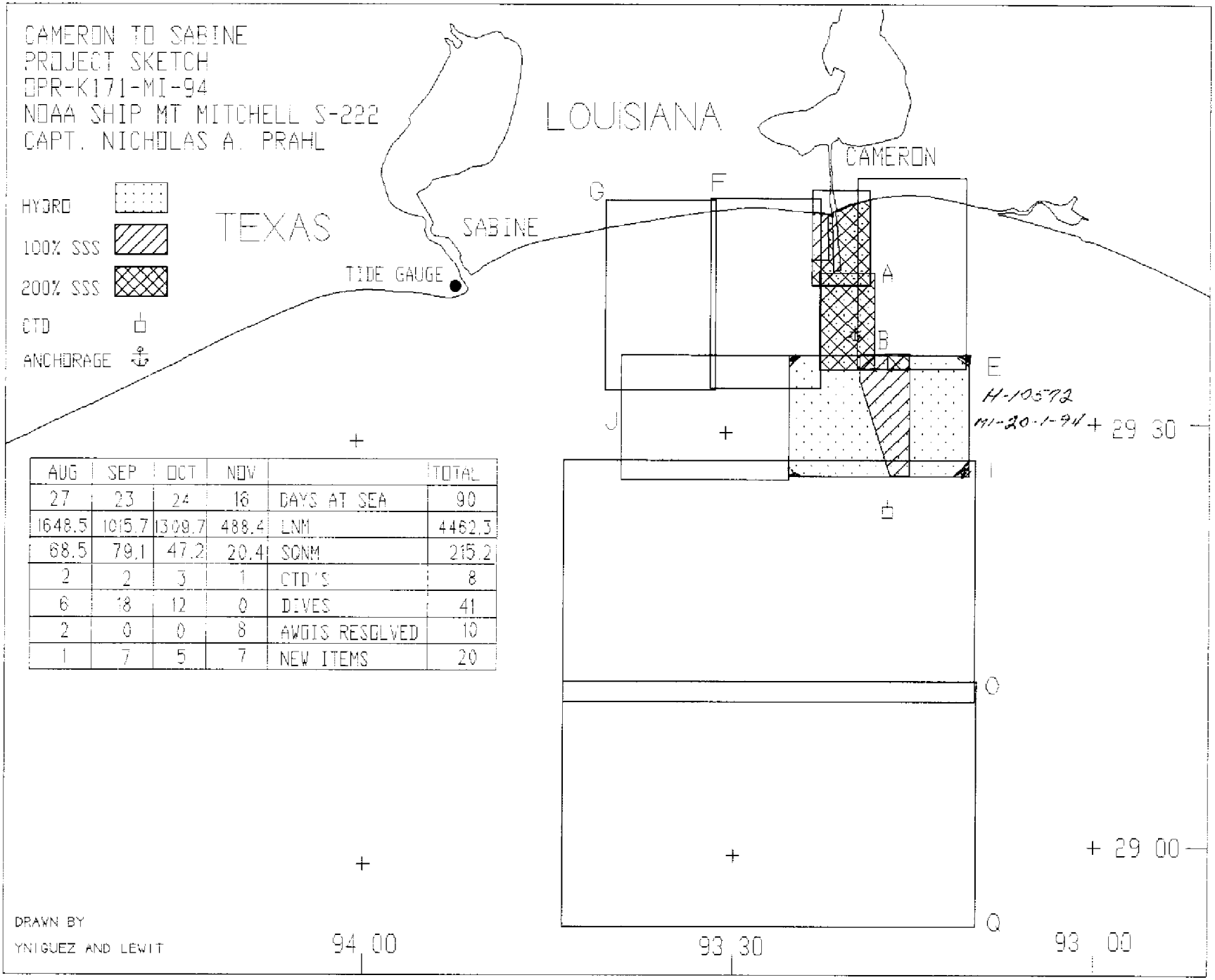
JC 3-18-97 SURF ✓ & AWOIS ✓ by MBH 2/21/97

NOAA FORM 77-28 SUPERSEDES FORM C & GS - 537

* U.S. GOVERNMENT PRINTING OFFICE: 1976-665-661/1222 REGION NO.6

CAMERON TO SABINE
PROJECT SKETCH
OPR-K171-MI-94
NOAA SHIP MT MITCHELL S-222
CAPT. NICHOLAS A. PRAHL

HYDRO
100% SSS
200% SSS
CTD
ANCHORAGE



AUG	SEP	OCT	NOV		TOTAL
27	23	24	16	DAYS AT SEA	90
1648.5	1015.7	1309.7	488.4	LNM	4462.3
68.5	79.1	47.2	20.4	SQNM	215.2
2	2	3	1	CTD'S	8
6	18	12	0	DIVES	41
2	0	0	8	AWOIS RESOLVED	10
1	7	5	7	NEW ITEMS	20

DRAWN BY
YNIGUEZ AND LEWIT

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* FILED WITH THE ORIGINAL FIELD RECORDS.

A. PROJECT

A.1 This survey was conducted in accordance with Project Instructions OPR-K171-MI-94, Cameron, Louisiana to Sabine, Texas.

A.2 The original date of the instructions is July 26, 1994.

A.3 No changes were made to the original instructions.

A.4 This survey was designated as sheet letter "I" by the project instructions.

A.5 Project OPR-K171-MI responds to a request from the National Transportation Safety Board to update the charted hydrography and to investigate wrecks and submerged features. Recent (1991) reconnaissance hydrography by the National Ocean Service in this area found sufficient differences to recommend that basic hydrography be conducted.

B. AREA SURVEYED

B.1 The survey area is located 12 nautical miles south of Calcasieu Pass, Louisiana. Existing depths are between 9 and 15 meters (28 to 49 feet). 200% side scan coverage is required in the navigable areas of the survey. For sheet "I", this includes the channel, safety fairways and anchorages leading to Calcasieu Pass. AWOIS items 6989 and 8766 are included on this sheet and require 400% side scan sonar coverage.

The primary traffic in the area are large bulk carrier ships, oil/gas tending and supply transports, tug and barge traffic, seismographic survey vessels, and fishing vessels. The larger deep draft ships transit this area enroute to the port of Lake Charles, Louisiana and also anchor in the designated anchorage.

B.2 The survey area is rectangular in shape. The latitude and longitude of the corners of the survey area are:

029° 26' 45.0''N	093° 24' 52.6''W
029° 26' 45.0''N	093° 09' 45.0''W
029° 34' 57.0''N	093° 24' 52.6''W
029° 34' 57.0''N	093° 09' 45.0''W

The AWOIS listing indicated that AWOIS items 6989 and 8766 both required 400% side scan coverage. AWOIS 6989 also required a side scan tow speed of less than 2.5 knots. The charted positions and search radii for the AWOIS items on this sheet are as follows:

Item	Charted Position	Search Radius
AWOIS 6989	29° 33' 54.83"N 093° 17' 24.56"W	2000 meters
AWOIS 8766	29° 28' 55.14"N 093° 17' 51.69"W	250 meters

B.3 Data acquisition began on August 21, 1994 (DN 233) and concluded on November 9, 1994 (DN 313).

C. SURVEY VESSELS

C.1 The following vessels were used during this project:

VESSEL	ELECTRONIC DATA PROCESSING NUMBER	PRIMARY FUNCTION
MT MITCHELL	2220	Hydrography/Side Scan Operations Processing, Velocity Casts
LAUNCH 1002 (MI-4)	2224	Hydrography/Side Scan Operations Velocity Casts
LAUNCH 1021 (MI-5)	2225	Hydrography/Side Scan Operations
LAUNCH 1008 (MI-6)	2226	Hydrography/Side Scan Operations

The ship was used as the primary platform of hydrography which was conducted when weather conditions precluded shallow water launch operations on surveys H-10560 and H-10561. As completion on those surveys became apparent, launches were allocated for work on this survey.

C.2 There were no unusual vessel configurations used for side scan sonar data acquisition during this field investigation. No problems were encountered with the standard launch stern tow of the side scan sonar towfish.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

See Also the Evaluation Report.

D.1 Survey data acquisition and processing were accomplished using the HDAPS system with the following software versions:

Program Name	Version	Date Installed
BACKUP	2.00	22 Feb 1994
BASELINE	1.14	22 Feb 1994
BIGABST	2.07	22 Feb 1994
BIGAUTOST	3.01	22 Feb 1994
BLKEDIT	2.02	22 Feb 1994
CARTO	2.15	23 Aug 1994
CLASSIFY	1.05	23 Aug 1994
CONTACT	2.41	23 Aug 1994
CONVERT	3.63	23 Aug 1994
DAS_SURV	6.74	23 Aug 1994
DIAGNOSE	3.05	23 Aug 1994
DISC_UTIL	1.00	22 Feb 1994
DP	2.15	23 Aug 1994
EXCESS	4.31	23 Aug 1994
FILESYS	3.27	23 Aug 1994
GRAFEDIT	1.06	22 Feb 1994
HIPSTICK	1.01	22 Feb 1994
HPRAZ	1.26	22 Feb 1994
INVERSE	2.01	22 Feb 1994
LISTDATA	1.02	22 Feb 1994
LOADNEW	2.10	22 Feb 1994
LSTAWOIS	3.07	04 Apr 1994
MAINMENU	1.20	22 Feb 1994
MAN_DATA	2.01	22 Feb 1994
NEWPOST	6.12	23 Aug 1994
PLOTALL	2.30	23 Aug 1994
POINT	2.10	22 Feb 1994
PREDICT	2.01	22 Feb 1994
PRESURV	7.09	23 Aug 1994
PRINTOUT	4.04	23 Aug 1994
QUICK	2.05	23 Aug 1994
RAMSAVER	2.11	23 Aug 1994
REAPPLY	2.11	23 Aug 1994
RECOMP	1.02	22 Feb 1994
SCANNER	1.00	22 Feb 1994
SELPRINT	2.05	23 Aug 1994
SYMBOLS	2.00	22 Feb 1994
VERSIONS	1.00	22 Feb 1994
ZOOMEDIT	2.30	23 Aug 1994

To conduct DGPS performance checks with MT MITCHELL (VesNo 2220), the SHIPDIM computer program was used. The launches used a *LOTUS 1-2-3* spreadsheet to compute performance checks.

D.2 Two programs were used to compute velocity correctors: *VELOCITY* (Ver. 2.10), dated March 15, 1994, and *CAT* (Ver. 2.00), dated December 18, 1992.

D.3 There were no nonstandard automated acquisition or processing methods used.

E. SIDE SCAN SONAR EQUIPMENT

E.1 Side scan sonar operations were conducted using an EG&G Model 260-TH slant range corrected side scan recorder and a Model 272-T (single frequency) towfish. The following list shows the equipment serial numbers and corresponding dates used for each boat.

Vessel Number	Equipment Type	Serial Number	Days Used
2220	Recorder	16672	233-313
2220	Towfish	11902	233-313
2224	Recorder	16673	284-313
2224	Towfish	11901	284-313
2225	Recorder	16946	296-313
2225	Towfish	11591	296-313
2226	Recorder	16669	284-313
2226	Towfish	11904	284-313

E.2 All side scan sonar towfish were configured with a 20° beam depression, which is the normal setting.

E.3 The 100 kHz frequency was used throughout the entire survey.

E.4

a) In sufficiently deep water and calm sea conditions the 100 meter range scale was used for coverage. Quite often sea conditions precluded the use of the 100 meter range scale. In which case, the 75 meter range scale was used to obtain adequate coverage with minimal sea return.

The 50 meter range scale was used for contact development.

Line spacing for main scheme coverage was determined using the formula provided in section 7.3.2.2 of the Field Procedures Manual ($LS_{max} = 2RS - 2EPE_{max}$). The predicted maximum estimated position error (EPE) did not exceed 15 meters within the survey area, so a maximum line spacing of 170 meters was established for the 100 meter range scale and 120 meter line spacing for the 75 meter range scale.

b) Daily opening and closing confidence checks were obtained either by towing the fish past the anchor chain of MT MITCHELL, or by towing it past the numerous platforms contained within the sheet. Confidence checks were also possible from scours on the bottom.

c) As indicated in section B.2 of this report, AWOIS items 6989 and 8766 required 400% side scan sonar coverage. Only 200% coverage was obtained on AWOIS 6989 prior to

departure from the working grounds. Complete 400% coverage was accomplished on AWOIS item 8766. Only 100% coverage was completed in the safety fairway and anchorage near the channel. No coverage was obtained in the safety fairway west of the search radius for AWOIS 6989.

d) On several occasions, schools of fish and dolphins were observed both in the water and on the trace. Patches of floating vegetation on the surface appeared as large dark blotches. In addition, other vessels created turbulence in the water resulting from their wakes. Whenever possible, these sources of noise were annotated on the sonargrams. When these factors obscured the sonar traces the affected area was rejected and rerun.

e) The towfish were deployed from the sterns of all vessels during the entire survey period.

E.5 Once a contact was considered significant, based on shadow height or fathometer readings, a launch was sent back to the contact for further development. The contact development consists of running several side scan sonar lines over the contact to ensonify the contact from different perspectives. These development lines were run using the 50 meter range scale for more detailed sonargrams.

Based on the results of the contact development, the contact was judged to be a "No Further Investigation" (NFI in the contact tables) or a "Pending Survey Completion" (PSC in the contact tables). Due to time constraints combined with weather downtime, some contacts were not developed. Completion of the 200% coverage in the safety fairway and anchorage may have resolved some of these contacts. All contacts that were not adequately resolved are labeled "Pending Survey Completion"

E.6 Any contact thought to be significant was entered into the contact tables. Significance was based on shadow height and general appearance of the contact. Once 100% coverage was achieved, the contact tables were analyzed to determine which contacts warranted development. The contacts deemed important were then developed using the procedures described in section E.5 above.

Overlap was checked on-line using the real-time swath plot and checked again during processing using the edited swath plot. Any overlap less than one millimeter at the scale of the survey was considered a gap. Gaps were filled by running additional side scan sonar lines.

During routine data acquisition for this sheet, several gaps in the side scan sonar coverage were created. The sources of these gaps included poor side scan quality, DGPS reception failures, bad helm, and starting or breaking lines inappropriately. These gaps were found during data processing and a launch was sent to run a "gap line" to achieve the appropriate side scan sonar coverage.

F. SOUNDING EQUIPMENT

F.1 All hydrographic soundings were acquired using a Raytheon 6000N Digital Survey Fathometer (DSF). The following list shows the equipment serial numbers and corresponding days used for each boat.

Vessel Number	Serial Number	Days Used
2220	A122N	233-255
2220	B046N	255-281
2220	B042N	281-313
2224	047N	284-293
2225	C066	296
2225	B053N	297-312
2226	B051N	284-313

F.2 No other sounding equipment was used during this survey. System checks on the fathometers were performed using lead lines. These lines were calibrated as per instructions in the Hydrographic Manual section 7.2.1.2. Refer to **Separate IV*** for calibration data.
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F.3 No faults in the sounding equipment were observed.

F.4 Both the high (100kHz) and the low (24 kHz) frequency sounding data were recorded during data acquisition. Only high frequency soundings were selected for plotting. Low frequency sounding data were examined for irregularities.

G. CORRECTIONS TO SOUNDINGS

G.1

a) The velocity of sound through water was determined by a Seacat conductivity, temperature, and density gage (serial numbers 192472-0284 & 192472-0285). The sensors on CTD unit 0284 were last calibrated on 22 December, 1993. The 0285 CTD unit was last calibrated on 15 December, 1993. On 05 August, 1994, a simultaneous independent test was made with these two units in 17 meters of water. Using the comparison utility of the *VELOCITY* program, the percent difference between the two casts was 0.00 at both the mid-depth, and the bottom of the cast.

A Data Quality Assurance test, performed using hydrometers manufactured by H-B Instrument Company, was run for each velocity cast to ensure the Seacat was within tolerance. All data were processed using *VELOCITY* Version 2.10 and *CAT* Version 2.00 software. The computed velocity correctors were entered into the HDAPS sound velocity tables and applied on-line to digitized high frequency soundings.

Sound velocity correctors applied to this survey were obtained as follows (even table numbers were used for the ship and odd numbers for the launches):

Cast #	Date	Latitude	Longitude	HDAPS Table #	Applied To Day #'s	CTD S/N
01	05 AUG 94	029/24/24 N	093/17/12 W	1/2	217-223	284
02	16 AUG 94	029/24/24 N	093/17/12 W	3/4	228-238	285
03	08 SEP 94	029/24/24 N	093/17/12 W	5/6	251-252	284
04	20 SEP 94	029/24/24 N	093/17/12 W	7/8	263-278	284
05	06 OCT 94	029/24/24 N	093/17/12 W	9/10	279-287	284
06	20 OCT 94	029/24/24 N	093/17/12 W	11/12	291-298	285
07	02 Nov 94	029/24/30 N	093/14/30 W	13/14	306-313	284

Detailed information and tables used to determine all corrections to soundings can be found in **Separate IV**. FILED WITH THE ORIGINAL FIELD RECORDS

b) There was no variation in the DSF-6000N instrument initial.

c) No instrument correctors to the DSF-6000N were required.

d) No instrument corrections were determined from direct comparison of lead-line checks.

Lead line comparisons to the DSF-6000N were made as follows:

VN	Day Number	Corrected Lead Line Depth (m)	Corrected Digital Depth (m)	Δd (m)
2220	233	11.3	11.4	0.1
2220	253	11.1	11.1	0
2220	258	10.1	10.0	-0.1
2220	266	11.6	11.7	0.1
2220	279	14.6	14.4	-0.2
2220	283	11.4	11.3	-0.1
2220	291	11.0	10.8	-0.2
2220	299	11.4	11.5	0.1
2220	306	10.8	10.8	0
2220	310	11.6	11.7	0.1
2220	313	9.6	9.7	0.1
2224	285	11.3	11.3	0
2224	286	11.4	11.3	-0.1
2224	292	14.3	14.1	-0.2
2224	296	11.4	11.2	-0.2
2224	307	10.7	10.6	-0.1
2224	311	10.8	10.7	-0.1
2224	312	12.5	12.3	-0.2
2225	296	11.3	11.1	-0.2
2225	313	12.1	12.1	0
2226	284	11.2	11.2	0
2226	286	11.4	11.3	-0.1

VN	Day Number	Corrected Lead Line Depth (m)	Corrected Digital Depth (m)	Δd (m)
2226	292	11.2	11.0	-0.2
2226	307	10.5	10.5	0
2226	311	12.2	12.4	0.2
2226	312	12.2	12.1	-0.1
2226	313	12.0	11.9	-0.1

e) All sounding correctors were applied to both the narrow (100 kHz) and the wide (24 kHz) beams.

f) The static draft of launches MI-5 (VesNo 2225) and MI-6 (VesNo 2226) were determined in March, 1994. The static draft of MI-4 (VesNo 2224) was determined in April, 1993. A calibrated steel tape was used to measure the distance from the transducer to a reference line on the launch above the water line. The launches were then put in the water and the distance from the water line to the reference line was measured. The static draft of MT MITCHELL's DSF-6000N transducer was measured by pneumogage. Static drafts were used in HDAPS offset tables online and during post-processing for all launches and the ship. Refer to **Separate III*** for the offset tables.

g) Settlement and squat correctors for each launch were determined using procedures outlined in the Hydrographic Manual on the Elizabeth River in April, 1993 (MI-4) and March, 1994 (MI-5 and MI-6). An observer, stationed with a level on a pier, measured changes in relative height as each launch ran toward and away from the observer at various speeds. The dynamic draft of the MT MITCHELL was determined in June, 1994. The "buoy and flat bottom" method described in Chapter 7 of the Hydrographic Manual was used to measure the dynamic draft. Settlement and squat correctors were applied to soundings through the HDAPS offset table. Refer to **Separate IV*** for a more detailed description of the static and dynamic draft determinations.

h) None of the launches are equipped with a heave, roll, and pitch sensor. Sea action on the fathogram from the launches was scanned out during processing. The MT MITCHELL is equipped with a Datawell 120CS Heave, Roll, and Pitch sensor (S/N 19079-CS). Sea action was not meaned out for data collected by the ship.

G.2 The HDAPS program "Reapply" was used for data collected on the first day of each leg. Velocity casts were performed at the start of each leg. On that first day, the launches or ship ran on velocity table 0, and on the appropriate table thereafter. Once the new HDAPS velocity table became available the data was reapplied correspondingly.

G.3 Velocity zoning was not required and there were no special correctors applied to the fathometers.

G.4 Pneumatic depth gauges were not used during this survey.

G.5 Frequently, sea conditions affected the fathogram, creating a trace of constant peaks

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and deeps. Launches are not equipped with heave, pitch and roll sensors. To compensate, the sea action was scanned out and selected sounding depths were edited during processing. Fathograms recorded on board MT MITCHELL were not scanned for sea action.

G.6

a) The tidal datum for this project is Mean Lower Low Water (MLLW). The operating tide station at Sabine Pass, Texas served as the reference station for predicted tides. Predicted tidal data was provided on floppy magnetic disk before the start of the project. APPROVED TIDES AND ZONING WERE APPLIED DURING OFFICE PROCESSING.

Water levels were monitored by a Next Generation Water Level Measurement System (NGWLMS) sensor at Sabine Pass, Texas (station number 877-0570). This gage served as the primary water level station for datum determination.

b) A height correction ratio of 1.40 and a time difference of -30 minutes were applied to predicted tides information at Sabine Pass, Texas. The tide tables were applied on-line and during processing of sounding data. For a more detailed overview of tidal information refer to **Appendix V**.

c) No zoning was required for this project.

H. CONTROL STATIONS SEE ALSO THE EVALUATION REPORT.

H.1 The horizontal datum for this project is the North American Datum of 1983 (NAD 83).

H.2 Four DGPS reference stations were used to control this survey. The list of horizontal control stations is ~~located in **Appendix III**~~. APPENDED TO THIS REPORT

H.3 Station USCG in Cameron, Louisiana was established by MT MITCHELL personnel to third-order class I standards by a GPS geodetic survey. Refer to the **Horizontal Control Report** submitted for this project for a description of the survey. This position was used to set up a NOAA High Frequency (HF) DGPS station for primary horizontal control of the project. The positions for the U.S. Coast Guard beacons were provided in the GPS User's Manual. The Galveston and Port Aransas beacons are both second-order class I positions. The New Orleans beacon is a B-order position.

H.4 The USCG station mark was recovered and surveyed in Cameron, Louisiana using the North American Datum of 1983 (NAD 83).

H.5 Refer to the **Horizontal Control Report** submitted with this project for a description of station establishment.

H.6 No position anomalies, problems, or unconventional survey methods occurred during

establishment of horizontal control for this project.

I. HYDROGRAPHIC POSITION CONTROL

I.1 The primary method of sounding position control was the Differential Global Positioning System (DGPS).

I.2 In accordance with the Field Procedures Manual (FPM), the maximum expected positional error (EPE) for this survey was 15 meters. At no time in this survey did the EPE consistently exceed 15 meters.

I.3 The NOAA-HF shore station consists of :

Ashtech M-XII GPS receiver,	S/N 700354B2503 from 08 AUG to 10 SEP
	S/N 700354B2504 from 11 SEP to 09 NOV
L1/L2 GPS antenna,	S/N 700228D2311
Raytheon 152 transceiver,	S/N BS26421 from 08 AUG to 10 SEP
	S/N BS29239 from 11 SEP to 09 NOV

LRD-2 Long Range Data Modulator, S/N 613

On each launch there is an Ashtech GPS receiver, a Magnavox MX-50R DGPS beacon receiver for U.S.C.G. differential beacons, and a LRD-1 long range data receiver for the NOAA-HF system. The ship also has the same equipment but is set up to monitor two reference stations simultaneously. The units used are as follows:

VESSEL #	MODEL	S/N
2220	Ashtech GPS Receiver "A"	700417B1196
	Ashtech GPS Receiver "B"	700417B1182
	Magnavox MX-50R Beacon Receiver "A"	315
	Magnavox MX-50R Beacon Receiver "B"	316
	LRD-1 HF Receiver	205
	GPS Antenna "A"	700391A0270
	GPS Antenna "B"	700391A0451
2224	Ashtech GPS Receiver	700417B1190
	Magnavox MX-50R Beacon Receiver	207
	LRD-1 HF Receiver	250
	GPS Antenna	700378A0468
2225	Ashtech GPS Receiver	700417B1129
	Magnavox MX-50R Beacon Receiver	036
	LRD-1 HF Receiver	233
	GPS Antenna	700391A0517

2226	Ashtech GPS Receiver	700417B1197
	Magnavox MX-50R Beacon Receiver	168
	LRD-1 HF Receiver	299
	GPS Antenna	700391A0232

I.4 As stated in section **H.2**, four DGPS reference stations were used: U.S.C.G. Galveston beacon, U.S.C.G. New Orleans beacon, U.S.C.G. Port Aransas beacon, and the NOAA-HF system at Cameron, LA. To ensure EPE's of less than 15 meters the following $HDOP_{max}$'s were determined using the formula from FPM section 3.4.2.

Station	ESE	EDE	Max. HDOP
NOAA HF	4	1.17	3.6
USCG Galveston	4	1.54	3.5
USCG New Orleans	4	3.86	2.7
USCG Port Aransas	4	5.15	2.3

DGPS performance checks were performed by comparing positioning of two independent DGPS stations. The inverse distance between the two independent stations' positions was computed to ensure it did not exceed the EPE_{max} of 15 meters. For the comparison, each of two launches brought up HDAPS, each using a different DGPS reference station for control. The launches would lay dead in the water alongside each other with their GPS antennae as close together as sea conditions permitted. The launches would then simultaneously mark their position by dumping the on-line HDAPS screen to the printer. The Easting and Northing values from each launch, along with the HDOP, and number of satellites used were entered into the LOTUS 1-2-3 spreadsheet for computation of position error. The performance checks were attempted once per week but were subject to down days due to bad weather. A copy of the performance checks are included in **Separate III.***

MT MITCHELL monitored two reference stations and recorded performance checks with the SHIPDIM program (version 1.3 and version 2.0). The results of the performance checks are included in **Separate III.***

I.5 No calibration data was applied to the DGPS raw positioning data.

I.6

a) No unusual methods of operation were employed with the DGPS equipment.

b) The primary control was the NOAA-HF system. The Coast Guard beacons were occasionally used as primary control on days when maintenance was performed on the NOAA-HF system. Coast Guard beacon use was also subject to their availability. On 13 October the Galveston beacon malfunctioned and remained inoperable for the rest of the project period. No positions were adversely affected.

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c) Localized thunderstorms occasionally downgraded the signals of the DGPS stations and correctors would not be received for a few seconds at a time. After 30 seconds of losing correctors, HDAPS goes into a dead reckoning (DR) mode. After 30 seconds of being in DR mode, HDAPS stops data collection. Survey operations would stop until the signal returned or the control was changed. If the signal was lost for only a few seconds, and it was felt that the course was steady through the period, data collection would continue.

d) Weak beacon signals, which caused loss of correctors, were occasionally observed when using either the New Orleans or Port Aransas beacons. This was attributed to their larger distance from the project area. Control was changed before data collection would begin when this occurred.

e) No systematic errors were observed.

f) Antenna positions were corrected for offset and layback, and referenced to the position of the DSF-6000N transducer. These correctors were located in the HDAPS Offset table, and applied on-line to the positioning algorithm. Refer to **Separate III*** for a copy of offset tables used during this survey. *FILED WITH THE ORIGINAL FIELD RECORDS

g) Offset and layback distances for the boom (tow point) were located in the HDAPS Offset table and applied on-line. The values of the offsets and laybacks are included in the same tables as discussed in section **f** above. These values, along with the cable length, towfish height, and depth of water, were used by the HDAPS system to compute the position of the towfish.

J. SHORELINE

No shoreline areas are present within the limits of this survey.

K. CROSSLINES

SEE ALSO THE EVALUATION REPORT.

K.1. Six percent of the hydrographic lines are crosslines. The hydrographic lines include the mainscheme hydrographic lines and the sounding lines collected during 100% side scan coverage.

K.2. Overall, agreement between the crosslines and mainscheme lines is excellent. The largest difference found between crosslines and mainscheme is 0.5 meters. This difference was found in several places on the sheet and is not indicative of a particular area.

K.3. The differences stated above could be attributed to different sea states from the times of collection between the mainscheme and the crosslines.

K.4. Crosslines were run with the ship and launch MI-4. In addition, mainscheme soundings were collected with all vessels listed for this survey. Direct comparison between those soundings yielded excellent agreement.

L. JUNCTIONS *SEE ALSO THE EVALUATION REPORT.*

L.1. This survey junctions with survey H-10561. H-10561 is a 1:10,000 scale survey conducted concurrently with H-10572 and overlaps in the northern middle part of the sheet.

L.2. Agreement between H-10561 and this survey is very good. The soundings generally agree to within 0.3 meters. One contact from H-10561 (# 5610.7) is contained within the limits of this sheet, however, H-10572 did not obtain side scan sonar coverage in this area. No side scan sonar contacts within shared coverage were found.

L.3. No differences between the surveys warrant further investigation.

L.4. No adjustments to soundings or features shared between H-10561 and H-10572 are recommended.

M. COMPARISON WITH PRIOR SURVEYS *SEE ALSO THE EVALUATION REPORT*

M.1 The following survey is the most recent prior survey in the H-10572 survey area available for comparison:

Registry #	Scale	Date
H-8796	1:40,000	1964

M.2 Soundings from H-8796 were compared to observed depths from the final plot of this survey at a 1:40,000 scale. All the soundings from the this survey are approximately 3 feet deeper than those from H-8796.

M.3 Four platforms in the survey area are present on H-8796. Platforms WC-110-A, WC-111-B, WC-110-1, and WC-110-8 from survey H-8796 are positioned exactly as MO-WC-110-A, MO-WC-111-B, MO-WC-110-10, and MO-WC-110-D respectively from survey H-10572. There are no other significant features from H-8796 that needed to be identified during this survey.

M.4 On average the observed depths are 3 feet deeper than the H-8796 survey. This appeared to be uniform for the entire survey area. There were no significant shoaling trends observed.

M.5 There were no contemporary non-NOS surveys in this area available for comparison.

N. ITEM INVESTIGATION REPORTS SEE ALSO THE EVALUATION REPORT.

There were two AWOIS items in the survey area. Descriptions are as follows:

AWOIS 8766

State and Locality: Louisiana, Calcasieu Pass

Position: 29/28/55.14 N 093/17/51.69 W

Datum: MLLW

Type of Feature: Item is not charted.

Source: FE346SS/90--RUDE; Obstruction (wreck-like contact) with no shadow was noted during NOAA Ship RUDE investigation of AWOIS item 403.

Survey Requirements: 400% side scan sonar coverage, 250 meter search radius, diver investigation.

Method of Investigation: A 250 meter search radius was established for 400% side scan sonar coverage.

Results of Investigation: The search radius for AWOIS 8766 was completely covered with 400% side scan sonar at 75 meter range scale. No contacts were discovered within the coverage area.

Comparison with Prior Surveys: Item not contained in prior surveys.

Comparison with Chart: Item is not charted.

Recommendation: This item investigation is considered resolved with disproval of obstruction. Do not chart. Concur. DELETE (:) Obstn PA.
NOT SHOWN ON CHART 11344

AWOIS 6989

State and Locality: Louisiana, Calcasieu Pass

Charted Position: 29/33/54.83 N 093/17/24.56 W

Datum: MLLW Reported Depth: Unknown

Type of Feature: Submerged Pipe, Position Doubtful

Source: LNM 18/81 -- 8th Coast Guard District; Pipe, position approximate, unlighted reported uncovers 6 inches in position 29/33/54 N, 093/17/24 W.

LNM 2/82 -- 8th Coast Guard District; Pipe previously reported has been unable to be located. (Charts revised to submerged pipe, position doubtful.)

Survey Requirements: 400% side scan sonar coverage, 2000 meter search radius, tow at 2.5 knots, echo sounder development, diver investigation, salvage documentation.

Method of Investigation: A 2000 meter search radius was established for 400% side scan sonar coverage. The launches are incapable of towing effectively at slower than 3.5 knots in no current conditions. Therefore, the restriction of 75 meter range scale was adhered to effectively achieving identical contact ensonification that would be done at 100 meter range scale at 2.5 knots. Refer to Sound Underwater Images, Guide to The Generation and Interpretation of Side Scan Sonar Data, by EG&G, page 173, Appendix A: Output Pulses per Meter of Forward Motion.

Results of Investigation: The search radius for AWOIS 6989 was covered with only 200% coverage due to time limitations for the project. There were contacts discovered within the search radius and the significant ones are discussed in the following developments. None of the contacts from the second 100% coverage correlated with contacts from the first 100% coverage.

Comparison with Prior Surveys: Item not on prior surveys.

Comparison with Chart: "Subm pipe PD" charted at above position.

Recommendation: No charting recommendation, pending survey completion. Do not Concur. See also the Evaluation Report.

Other Contacts

As stated previously, several contacts were discovered and entered into the contact tables. Most of the items were later labeled "Insignificant" (INSIG) and "No Further Investigation" (NFI). After careful examination of fathograms and sonargrams, most of these contacts were explained as bottom texture characteristics, sea state interference, fathometer/side scan interference, depressions and scours, or biological material in the water column. Some contacts that were considered significant were developed on DN 307 and 312. A few contacts were entered after the survey period or could not be developed due to time constraints. They were labeled "Pending Survey Completion" (PSC). **Separate V*** contains the contact tables. In addition, some of the developments need further investigation and are also labeled PSC. The descriptions of the contacts that were developed follows.

*FILED WITH THE ORIGINAL FIELD RECORDS

Development 2405

Contacts:	DN	REF. FIX #'S	ACTIVITY
	266	2405.51	100% SSS
	312	6072.14, 6074.18, 6076.18, 6078.12	Development

Results of Investigation: The contact was first seen on DN 266 and was considered significant and entered in the contact tables. The initial contact height was 4.1 meters. On DN 312 the site was developed with 50 meter range scale (fixes 6072-6079). This development yielded other contacts which had heights ranging between 0.9 and 1.2 meters in 12.0 meters of water. Two of these contacts were grouped within 30 meters of the initial contact. This development needs diver investigation. CHART ANOBSTRUCTION (REP 1994) WITH ASSESTIMATED DEPTH OF 36 FT (11.1 M) IN LAT 29-30-46.976 N, LON. 93-12-36.647 W. CHART AS 36 OBSTN (REP 1994).

Recommendation: Do not chart, ~~pending survey completion.~~ ~~CONCUR. THIS ITEM WAS CONSIDERED INSIGNIFICANT DURING OFFICE PROCESSING.~~ DO NOT CONCUR.

Development 2410

Contacts:	DN	REF. FIX #'S	ACTIVITY
	266	2410.66	100% SSS

Results of Investigation: The contact was first seen on DN 266 and was considered significant and entered in the contact tables. The initial contact height was 1.8 meters. On DN 312 the site was developed with 50 meter range scale (fixes 6104-6109). This development yielded no other contacts.

Recommendation: Do not chart, no further investigation. Concur.

Development 2460

Contacts:	DN	REF. FIX #'S	ACTIVITY
	279	2460.19	100% SSS
	312	6082.19, 6086.18	Development

Results of Investigation: The contact was first seen on DN 279 and was labeled as a mooring buoy for a crane-barge that was removing platform KM-WC-100A. The initial contact height was 1.4 meters. On DN 312 the site was developed with 50 meter range scale (fixes 6080-6087). This development yielded two other contacts grouped within 30 meters which were not considered significant and did not appear as the initial contact. Consequently, the crane-barge and its' mooring buoys left the area upon completing removal of the platform.

Recommendation: Do not chart, no further investigation. Concur

Development 2475

Contacts:	DN	REF. FIX #'S	ACTIVITY
	279	2475.09, 2475.34	100% SSS

Results of Investigation: The contacts were first seen on DN 279 and were considered significant and entered in the contact tables. The initial contact heights were 0.2 and 2.5 meters respectively. On DN 307 the site was developed with 50 meter range scale (fixes 15265-15272). No other contacts were located during the development.

Recommendation: Do not chart, no further investigation. Concur

Development 2527

Contacts:	DN	REF. FIX #'S	ACTIVITY
	279	2527.05	100% SSS
	307	15249.23	Development

Results of Investigation: The contact was first seen on DN 279 and was considered significant and entered in the contact tables. The initial contact height was 2.4 meters. On DN 307 the site was developed with 50 meter range scale (fixes 15245-15252). One small contact was located during the development with a height of 1.5 meters. Both contacts were considered insignificant upon close examination of the side scan sonar traces.

Recommendation: Do not chart, no further investigation. Concur

Development 10122

Contacts:	DN	REF. FIX #'S	ACTIVITY
	285	10122.86	100% SSS

Results of Investigation: The contact was first seen on DN 285 and was considered significant and entered in the contact tables. The initial contact height was 2.0 meters. On DN 312 the site was developed with 50 meter range scale (fixes 6056-6063). No contact was located during the development.

Recommendation: Do not chart, no further investigation. Concur

Development 10189

Contacts:	DN	REF. FIX #'S	ACTIVITY
	286	10189.16	100% SSS

Results of Investigation: The contact was first seen on DN 286 and was considered significant and entered in the contact tables. The initial contact height was 4.3 meters. On DN 312 the site was developed with 50 meter range scale (fixes 6050-6055). No contacts were discovered during the development.

Recommendation: Do not chart, no further investigation. Concur

Development 10302

Contacts:	DN	REF. FIX #'S	ACTIVITY
	293	10302.27	100% SSS
	312	6096.15, 6098.11	Development

Results of Investigation: The contact was first seen on DN 293 and was considered significant and entered in the contact tables. The initial contact height was 4.3 meters. On DN 312 the site was developed with 50 meter range scale (fixes 6096-6103). Two contacts were located during the development that fall within 15 meters of the initial contact. One contact height computed to 1.4 meters. These contacts did not have a strong return during the development and are not considered significant.

Recommendation: Do not chart, no further investigation. Concur

Development 10316

Contacts:	DN	REF. FIX #'S	ACTIVITY
	293	10316.01	100% SSS
	312	6064.17, 6068.13, 6070.18	Development

Results of Investigation: The contact was first seen on DN 293 near buoy red "4". The initial contact height was 1.3 meters. On DN 312 the site was developed with 50 meter range scale (fixes 6064-6071). Three contacts were located during the development that were computed to within 21 meters of the initial contact. All had a contact height of 1.0 meter or less and are not considered significant.

Recommendation: Do not chart, no further investigation. Concur

Development 10343

Contacts:	DN	REF. FIX #'S	ACTIVITY
	294	10343.77	100% SSS
	307	15253.11,15259.22	Development
		15255.22,15257.15	

Results of Investigation: The contact was first seen on DN 294 and was considered significant and entered in the contact tables. The initial contact height was 0.5 meters. On DN 307 the site was developed with 50 meter range scale (fixes 15253-15264). Contacts were located during the development with the largest height of 1.4 meters. The development of the contacts appear to be of a large scour with the contacts being a large depression at the head of the scour.

Recommendation: Do not chart, no further investigation. Concur

Development 10356

Contacts:	DN	REF. FIX #'S	ACTIVITY
	294	10356.03	100% SSS

Results of Investigation: This contact was entered to mark the location of the site for Platform KM-WC-100-A which was removed during the first part of this survey period. On DN 312 the site was developed with 50 meter range scale (fixes 6088-6095). All of the shadows on the side scan sonar trace appear to be from depressions where the foundation of the platform once rested. No solid contacts were discovered.

Recommendation: Do not chart, no further investigation. Concur.

Development 10496

Contacts:	DN	REF. FIX #'S	ACTIVITY
	297	10496.44	200% SSS, AWOIS 6989

Results of Investigation: The contact was first seen on DN 297 and was considered significant and entered in the contact tables. The initial contact height was 1.5 meters. On DN 312 the site was developed with 50 meter range scale (fixes 6134-6135). No contacts were discovered during the development.

Recommendation: Do not chart, no further investigation. Concur

Development 10498

Contacts:	DN	REF. FIX #'S	ACTIVITY
	297	10498.27	200% SSS, AWOIS 6989

Results of Investigation: The contact was first seen on DN 297 and was considered significant and entered in the contact tables. The initial contact height was 1.3 meters. On DN 312 the site was developed with 50 meter range scale (fixes 6136-6139). No contacts were discovered during the development.

Recommendation: Do not chart, no further investigation. Concur

Development 10515

Contacts:	DN	REF. FIX #'S	ACTIVITY
	298	10515.39	200% SSS, AWOIS 6989

Results of Investigation: The contact was first seen on DN 298 and was considered significant and entered in the contact tables. The initial contact height was 3.2 meters. On DN 312 the site was developed with 50 meter range scale (fixes 6124-6133). No contacts were discovered during the development.

Recommendation: Do not chart, no further investigation. Concur

Development 10529

Contacts:	DN	REF. FIX #'S	ACTIVITY
	298	10529.38	200% SSS, AWOIS 6989

Results of Investigation: The contact was first seen on DN 298 and was considered significant and entered in the contact tables. The initial contact height was 1.5 meters. On DN 312 the site was developed with 50 meter range scale (fixes 6118-6123). No contacts were discovered during the development.

Recommendation: Do not chart, no further investigation. Concur

Development 15178

Contacts:	DN	REF. FIX #'S	ACTIVITY
	298	15178.29	100% SSS
	312	6110.15, 6114.2, 6116.1	Development

Results of Investigation: The contact was first seen on DN 298 and was considered significant and entered in the contact tables with an initial height of 0.9 meters. Contact 15198.1 also falls close to the initial contact but has an insignificant height. On DN 312 the site was developed with 50 meter range scale (fixes 6110-6117). Contacts were found during the development, but none were significant.

Recommendation: Do not chart, no further investigation. Concur

FATHOMETER DEVELOPMENTS

Four significant fathometer spikes were found during side scan sonar and mainscheme hydrography collection and were developed to ensure quality of the fathometer trace. They are listed here:

DN	REF. FIX #'S	Spike Height
284	10040.8	7.0 m
284	10044.55	4.0 m
284	10048.85	8.0 m
284	10058.28	2.0 m

On DN 312, hydro developments (fixes 10621-10682) were done on all spikes. The fathometer spikes proved unrepeatable and the original spikes were explained as biological material in the water column which require no further investigation.

O. COMPARISON WITH THE CHART See also the Evaluation Report

O.1 The following charts are affected by this survey:

Chart #	Edition/Date	Scale	Next Edition
11340	54th/August 10, 1991	1:458,596	January 1996
11341	35th/May 7, 1994	1:80,000	June 1997
11344	30th/January 29, 1994	1:80,000	July 1996
11347 SC	26th/October 2, 1993	1:50,000	April 1996

During the period of survey operations, there have been no pertinent notice to mariner updates from the above charts affecting the survey area.

O.2 No danger to navigation reports were filed with this survey.

O.3 Sixty-one soundings from enlargements of charts 11341 and 11347 were compared to soundings obtained from this survey at a 1:20,000 scale. The data from this survey was on average 3 feet deeper uniformly over the entire survey area. No soundings from this survey were shoaler than the charted depths. Depths in the channel averaged 14.3 meters at the centerline with 12.5 to 13.0 meters on the outer edges of the channel. The chart lists controlling depths of the channel as 42.0 feet which is in good agreement with this survey.

O.4 The following non-sounding features are in the survey area: (Positions are taken from the HDAPS Detached Position utility. Pictures of the features are located in **Appendix II.**)*

* Filed with the original field records.

Item	Designation	DP Fix	Lat. (N)	Lon. (W)
Platform	ELF-WC 146-9	15213	29/26/52.01	093/16/45.48
Platform	MO-WC-110-E	15219	29/29/48.73	093/16/51.96
Platform	MO-WC-110-4	15221	29/30/21.38	093/16/42.63
Platform	MO-WC-110-10	15222	29/30/17.02	093/16/38.32
Platform	MO-WC-110-9	15224	29/30/33.97	093/16/35.14
Platform	MO-WC-110-D	15225	29/30/42.16	093/16/31.82
Platform	MO-WC-110-3	15227	29/30/33.85	093/15/54.36
Platform	MO-WC-110-11	15229	29/30/52.40	093/16/41.37
Platform	MO-WC-110-A	15230	29/31/05.47	093/17/02.86
Platform	MO-WC-110-2	15231	29/30/48.26	093/17/29.51 - ecw
Platform	MO-WC-111-B	15233	29/30/28.02	093/17/49.36

Item	Designation	DP Fix	Lat. (N)	Lon. (W)
Platform	WC-109-OCS-G7601	15238	29/31/48.25	093/12/13.65
Platform	WC-101-L	15239	29/33/56.56	093/10/00.60
Platform	MO-WC-110-J	15244	29/34/03.75	093/10/08.39
Well	No Identifier	5620	29/32/39.24	093/18/20.12

The fifteen items listed above represent all of the permanent features visible above the water line within the boundaries of the survey sheet. The hydrographer is confident that no visible feature within the sheet boundaries was overlooked during the survey period. Concur
See also the Evaluation Report.

Charted features not found during the survey:

Item	Designation	Lat. (N)	Lon. (W)
Platform	KM-WC-100-A	29/32/07.80	093/13/02.40
Platform	UTPC-WC-41-1	29/29/40.80	093/23/22.20
Platform	Unknown	29/30/16.20	093/16/21.00

MT MITCHELL witnessed platform KM-WC-100-A being removed during the survey period. It is recommend that the three platforms listed above be deleted from the chart. Concur

O.5 No changes to the scale of the published charts of the survey are recommended. It is recommended that chart 11344 be centered on Calcasieu Pass to facilitate navigation through this area.

P. ADEQUACY OF SURVEY See also the Evaluation Report

P.1 AWOIS item 8766 has been resolved. AWOIS item 6989 has 200% of the required 400% side scan sonar coverage completed. There are some significant contacts within the coverage area that need to be developed to consider this item resolved. The hydrography from this survey is adequate to supersede prior surveys. In addition, all above water line features are adequate to update the chart.

P.2 Only 100% of the required 200% side scan sonar coverage has been completed in the safety fairway and anchorage. Mainscheme splits were also required in the safety fairway and anchorage to give an effective line spacing of 100 meters. The sounding data from the 100% side scan sonar coverage was used as these splits in order to complete the survey before leaving the project area. For logistical reasons of side scan sonar operation (line spacing for swath coverage), the actual line spacing varied from 60 to 120 meters. Elsewhere on the sheet the required 200 meter line spacing for a 1:20,000 scale survey was achieved.

Q. AIDS TO NAVIGATION

Q.1 The MT MITCHELL conducted no correspondence with the U.S. Coast Guard regarding floating aids to navigation.

Q.2 There are Coast Guard maintained aids to navigation on this survey sheet. Buoys R "2B" through R "18" mark the channel and one buoy (G "1") is stationed on a shoal that is part of Sabine Bank. The buoys, their detached positions, charted positions, and comparisons of those positions follow: THESE AIDS APPEAR ADEQUATE TO SERVE THEIR INTENDED PURPOSES.

Buoy Name	Charted Position	Survey Position	Distance (m)	D. P.
G "1"	29° 27.0' N 93° 18.5' W	29° 27' 02.964" N 93° 18' 31.137" W	96.3	15214
R "2B"	29° 27.3' N 93° 13.3' W	29° 27' 20.687" N 93° 13' 20.724" W	110.6	15212
G "3"	29° 28.9' N 93° 13.5' W	29° 28' 59.152" N 93° 13' 33.484" W	184.4	15211
R "4"	29° 29.0' N 93° 13.3' W	29° 28' 59.495" N 93° 13' 22.487" W	121.9	15210
G "5"	29° 30.0' N 93° 13.6' W	29° 30' 00.758" N 93° 13' 34.825" W	39.4	15209
R "6"	29° 30.0' N 93° 13.4' W	29° 30' 01.442" N 93° 13' 23.635" W	45.5	15208
G "7"	29° 30.8' N 93° 13.6' W	29° 30' 52.401" N 93° 13' 35.756" W	135.6	15207
R "8"	29° 31.1' N 93° 13.5' W	29° 31' 08.138" N 93° 13' 28.179" W	82.1	15206
G "9"	29° 31.2' N 93° 13.7' W	29° 31' 14.888" N 93° 13' 44.144" W	106.0	15205
G "11"	29° 31.8' N 93° 14.3' W	29° 31' 52.247" N 93° 14' 17.968" W	130.8	15204
R "12"	29° 31.9' N 93° 14.1' W	29° 31' 58.215" N 93° 14' 08.573" W	147.1	15203
R "14"	29° 32.8' N 93° 14.9' W	29° 32' 47.306" N 93° 14' 53.193" W	30.5	15202

G "15"	29° 33.5' N 93° 15.7' W	29° 33' 28.335" N 93° 15' 44.667" W	88.2	15201
R "16"	29° 33.6' N 93° 15.6' W	29° 33' 34.643" N 93° 15' 35.247" W	46.4	15200
R "18"	29° 34.4' N 93° 16.3' W	29° 34' 23.541" N 93° 16' 19.207" W	35.4	5621

Buoy G"1" was the only buoy not found in the Light List. L.L. VOL. IV NO 995, PAGE 11. "SABINE BANK EAST END LIGHTED GONG"

Q.3 No other aids were located during the survey.

Q.4 No bridges, overhead cables or above surface pipelines are within the survey limits.

Q.5

a) No submarine cable crossings to shore are present within the survey limits.

b) There are several submarine pipelines within the survey limits. These pipelines form a network connecting the platforms in the area.

c) There are no ferry routes in the survey area.

Q.6 There are no ferry terminals in the survey area.

R. STATISTICS

R.1.	VN 2220	VN 2224	VN 2225	VN 2226	Total
a) Number of positions:	3222	1132	284	787	5425
b) Lineal nautical miles of SSS/sounding lines:	1194.2	337.4	68.5	227.1	1827.2

R.2					
a) Total square nautical miles of hydrography:					105
b) Total days of production:	20	13	5	13	33*
c) Detached positions:	0	2	28	0	30
d) Bottom samples	76	0	10	0	86
e) Tide stations:					1
f) Current stations					0
g) Velocity casts:					7
h) Magnetic stations					0
i) XBT drops					0
j) Dives:					0

*sea days used in production

No current stations, magnetic stations or XBT drops were established or performed.

S. MISCELLANEOUS See also the Evaluation Report.

S.1

a) No unusual silting was noted during this survey.

b) All unusual submarine features have been discussed previously.

c) No anomalous tidal conditions were encountered.

d) No anomalous current conditions were encountered.

e) No magnetic anomalies were encountered during this survey.

S.2 No bottom samples were submitted to the Smithsonian Institution.

T. RECOMMENDATIONS

T.1 All inadequacies have been noted in section **P**.

T.2 There is no present or planned construction or dredging that will affect results of this survey. However, this area is densely populated with oil rigs, platforms, and wellheads. It is probable that additional items may appear, or existing items may move, due to the dynamic nature of the oil industry.

T.3 There were no unusual conditions or sea features which require further investigation other than the resolving of the AWOIS item 6989 and significant contacts of this survey.

U. REFERRAL TO REPORTS

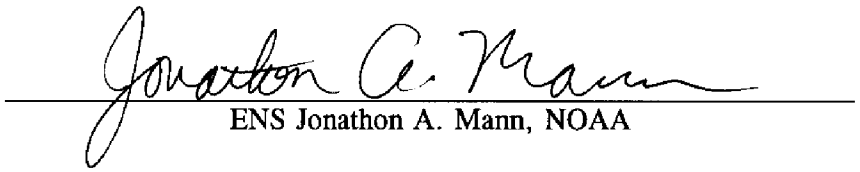
The following reports are not included with the survey records:

Horizontal Control Report

Coast Pilot Report

SUBMITTAL SHEET
Survey H-10572

This descriptive report accurately describes all activities pertaining to the control, collection and processing of data for this survey, and is respectfully submitted by:

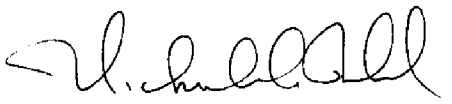


ENS Jonathon A. Mann, NOAA

Letter of Approval

Registry No. H-10572

Field operations of this survey were conducted under my supervision with frequent personal checks of progress and adequacy. This report and field sheets have been closely reviewed for accuracy pertaining to the control, collection and processing of data for this survey. The hydrography and above water line features are adequate for updating the chart.



CAPT Nicholas A. Prahl, NOAA
Commanding Officer, NOAA Ship MT MITCHELL

APPENDIX III
List of Horizontal Control Stations

Station 000 - United States Coast Guard, English Turn, Louisiana Differential Beacon

Lat: 29° 52' 43.878" N
Long: 089° 56' 31.380" W
Source: GPS User's Manual

Transmission Frequency: 293 KHz
Transmission Rate: 200 bps

Station 001 - USCG, Pilot Station, Cameron, Louisiana (NOAA-HF System)

Lat: 29° 46' 40.841" N
Long: 093° 20' 34.650" W
Source: Horizontal Control Report

Transmission Frequency: 277450 KHz
Transmission Rate: 100 bps

Station 002 - United States Coast Guard, Galveston, Texas Differential Beacon

Lat: 29° 19' 45.092" N
Long: 094° 44' 10.484" W
Source: GPS User's Manual

Transmission Frequency: 296 KHz
Transmission Rate: 100 bps

Station 003 - United States Coast Guard, Port Aransas, Texas Differential Beacon

Lat: 27° 50' 18.156" N
Long: 097° 03' 32.646" W
Source: GPS User's Manual

Transmission Frequency: 304 KHz
Transmission Rate: 100 bps

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Ocean and Earth Sciences
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: March 21, 1995

HYDROGRAPHIC SECTION: Atlantic

HYDROGRAPHIC PROJECT: OPR-K171

HYDROGRAPHIC SHEET: H-10572

LOCALITY: Cameron, Louisiana to Sabine, Texas

TIME PERIOD: August 21 - November 9, 1994

TIDE STATION USED: 877-0570 Sabine Pass, North, Tx.
Lat. 29° 43.8'N Lon. 93° 52.2'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 2.78 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.5 ft.

REMARKS: RECOMMENDED ZONING

Apply a -40 minute time correction and a x1.35 range ratio to heights using Sabine Pass, North, Tx. (877-0570).

Notes: 1. Times are tabulated in Greenwich Mean Time.
2. Data for Sabine Pass, North, Tx. (877-0570) are temporarily stored in file #677-0570.

William M. Hulsa

CHIEF, DATUMS SECTION

NOAA FORM 76-155 (11-72)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

GEOGRAPHIC NAMES

SURVEY NUMBER: H-10572

Name on Survey	A ON CHART NO. 11341, 11344, 11345	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K	
CALCASIEU PASS (title)	X		X							1
LOUISIANA (title)	X		X							2
MEXICO, GULF OF	X		X							3
										4
										5
										6
										7
										8
										9
										10
										11
										12
										13
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										15
										16
										17
										18
				Approved						19
										20
				Chief Geographer						21
										22
				JAN 19 1996						23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

NOAA FORM 61-29
(12-71)

U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

LETTER TRANSMITTING DATA

REFERENCE NO.
N/CS33-5-97

DATA AS LISTED BELOW WERE FORWARDED TO YOU BY *(Check)*:

☐ ORDINARY MAIL ☐ AIR MAIL
☐ REGISTERED MAIL ☒ EXPRESS
☐ GBL *(Give number)* _____

TO:

NOAA/National Ocean Service
Chief, Data Control Group, N/CS3x1
SSMC3, Station 6815
1315 East-West Highway
Silver Spring, MD 20910-3282

DATE FORWARDED
February 7, 1997

NUMBER OF PACKAGES
1 Box, 1 Tube

NOTE: A separate transmittal letter is to be used for each type of data, as tidal data, seismology, geomagnetism, etc. State the number of packages and include an executed copy of the transmittal letter in each package. In addition the original and one copy of the letter should be sent under separate cover. The copy will be returned as a receipt. This form should not be used for correspondence or transmitting accounting documents.

H-10572

Louisiana, Gulf of Mexico, 12nm South of Calcasieu Pass

1 Box Containing:

1 Original Descriptive Report for H-10572
1 Envelope with 3 HISTORY OF CARTOGRAPHIC WORK (NOAA form 76-71) for H-10572 for charts 11341, 11344 and 11347,

1 Tube Containing:

1 Original Smooth Sheet for H-10572
2 Paper Composite plots, (1 of 2) & (2 of 2) of Survey H-10572 for NOS chart 11347
1 Mylar H-DRAWING of H-10572 for NOS chart 11347
2 Paper Composite plots, (1 of 2) & (2 of 2) of Survey H-10572 for NOS chart 11344
1 Mylar H-DRAWING of H-10572 for NOS chart 11344
1 Paper Composite plot, of Survey H-10572 for NOS chart 11341
1 Mylar H-DRAWING of H-10572 for NOS chart 11341

FROM: *(Signature)* R. H. Whitfield
Richard H. Whitfield

RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

Atlantic Hydrographic Branch N/CS331
439 W. York Street
Norfolk, VA 23510-1114

NOAA FORM 61-29 SUPERSEDES FORM C&GS 413 WHICH MAY BE USED.

☆U.S.GPO:1983-0-664-006/1192

ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H-10572 (1994)

This Evaluation Report has been written to supplement and/or clarify the original Descriptive Report. Sections in this report refer to the corresponding sections of the Descriptive Report.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

The following software was used to process data at the Atlantic Hydrographic Branch:

Hydrographic Processing System (HPS)
AutoCAD, Release 12
QUICKSURF, version 5.1
MicroStation, version 5.0
NADCON, version 2.10
I/RAS B, version 5.01

The smooth sheet was plotted using an ENCAD NovaJet III plotter.

H. CONTROL

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83). The smooth sheet has been annotated with ticks showing the computed mean shift between the NAD 83 and the North American Datum of 1927 (NAD 27).

To place this survey on the NAD 27, move the projection lines 0.838 seconds (25.79 meters or 1.29 mm at the scale of the survey) north in latitude, and 0.560 seconds (15.08 meters or 0.75 mm at the scale of the survey) west in longitude.

K. CROSSLINES

A constant one to two foot discrepancy was noted in the vicinity of two crosslines and mainscheme hydrography run by launch 2224 on October 23 and October 24, 1994 (DOYs 296 and 297). Major discrepancies occurred along the East-West crosslines at the following latitudes:

29°30'34"N

29°32'45"N

The hydrography in these areas is consistently shoaler than the rest of main survey in these areas. Page 8 of the Descriptive Report for survey H-10560 (1994) notes that heavy rains and flooding occurred in the project area during this time period. Analysis of the tide data collected at the Sabine Pass tide gauge reflects higher than normal water

levels during this period. The discrepancy in agreement is likely due to the inadequacy of tidal zoning correctors applied to the offshore crossline soundings. This inadequacy appears to be an isolated case as crosslines and mainscheme hydrography run at different times and in different areas agreed well (0-1 ft) throughout the survey area.

L. JUNCTIONS

H-10561 (1994) to the north

A standard junction was effected between the present survey and survey H-10561 (1994).

There are no contemporary surveys to the east, west, and south of the present survey. Present survey depths are in harmony with the charted hydrography to the east, west, and south.

M. COMPARISON WITH PRIOR SURVEYS

Hydrographic

H-8796 (1964) 1:40,000

An adequate comparison was made with prior survey H-8796 (1964) in section M., page 14, of the Descriptive Report.

The present survey is adequate to supersede the prior survey in the common area unless stated noted.

Wire Drag

A comparison with wire drag survey H-9627WD (1976) was not done during office processing in accordance with section 4. of the memorandum titled, *Changes to Hydrographic Survey Processing*, dated May 24, 1995.

Side Scan Sonar

FE-346SS (1990) 1:20,000

Six charted features within the survey area were investigated by prior survey FE-346SS (1990).

1. A charted wreck with a wire drag clearance depth of 36 feet, in Latitude 29°34'25"N, Longitude 93°13'09"W, shown on NOS chart 11344 originates with H-9627WD (1976). There was no requirement for investigation by the field unit in 1994. Two

hundred percent side scan coverage conducted during survey operations revealed no indication of a wreck or obstruction in the area. Present survey depths in the area are 37 to 38 feet. This item was disproved by FE-346SS (1990) [AWOIS Item #6990] by a 400% side scan sonar investigation. It is recommended that the wreck with a wire drag clearance depth of 36 feet be deleted from on NOS chart 11344. This feature is not shown on NOS chart 11347 (27th Ed., Dec. 3/94); no change in charting status is recommended.

2. A charted dangerous submerged obstruction rep (1975) with a depth of 35 feet, in Latitude 29°32'01"N, Longitude 93°17'30"W, is shown on NOS chart 11344. There was no requirement for investigation by the field unit in 1994. The item was determined to be a pipe with a depth of 35 feet by prior survey FE-346SS (1990). It is recommended that the note "rep (1975)" be deleted from the chart and the dangerous submerged obstruction (rep 1975) be revised to a dangerous submerged obstruction with a depth of 35 ft [35 *Obstn* (pipe)] on NOS chart 11344. This feature is correctly charted on NOS chart 11347 (27th Ed., Dec 3/94); no change in charting status is recommended.

3. A charted dangerous submerged obstruction rep PA with a depth of 38 feet, in Latitude 29°32'08"N, Longitude 93°17'22"W, is shown on NOS chart 11344. There was no requirement for investigation by the field unit in 1994. The item was determined to be a pipe with a depth of 38 feet by prior survey FE-346SS (1990). It is recommended that the notes "rep" and "PA" be deleted from the chart and the dangerous submerged obstruction be retained as charted on NOS chart 11344. This feature is correctly charted on NOS chart 11347 (27th Ed., Dec 3/94); no change in charting status is recommended.

4. A charted dangerous submerged obstruction, in Latitude 29°33'08"N, Longitude 93°19'30"W, is shown on NOS chart 11344. There was no requirement for investigation by the field unit in 1994. This item was disproved by FE-346SS (1990) [AWOIS Item #6988]. It is recommended that the dangerous submerged obstruction be deleted from NOS chart 11344. This feature is not shown on NOS chart 11347 (27th Ed., Dec 3/94); no change in charting status is recommended.

5. A charted dangerous sunken wreck PA, in Latitude 29°28'26.8"N, Longitude 93°16'52.5"W, is shown on NOS chart 11344. There was no requirement for investigation by the field unit in 1994. This item was disproved by FE-346SS (1990) [AWOIS Item #403]. It is recommended that the

dangerous sunken wreck be deleted from NOS chart 11344. This feature is not shown on NOS chart 11347 (27th Ed., Dec 3/94); no change in charting status is recommended.

6. A charted dangerous sunken wreck with a wire drag clearance of 33 feet, in Latitude 29°32'18.6"N, Longitude 93°14'52.9"W, is shown on NOS chart 11344. There was no requirement for investigation by the field unit in 1994. During office processing, a side scan sonar contact was noted at the location of the charted wreck. This item was previously located by FE-346SS (1990) [AWOIS Item #6987] and found to be an anchor with a least depth of 35 feet. It is recommended that the dangerous sunken wreck with a wire drag clearance of 33 feet be revised to a dangerous submerged obstruction with a depth of 35 feet (35 *Obstn*) on NOS chart 11344. This feature is correctly charted on NOS chart 11347 (27th Ed., Dec 3/94); no change in charting status is recommended.

N. ITEM INVESTIGATIONS

AWOIS Item #6989, a charted submerged pipe, PD, in Latitude 29°33'54.83"N, Longitude 93°17'24.56"W originates with Local Notice to Mariners 18 of 1981 (LNM18/81); revised by LNM2/82. This AWOIS listing required 400% side scan sonar coverage within a 2000 meter search radius for disproval. Two hundred percent side scan sonar coverage was accomplished within the required area. Time constraints prevented completion of 400% side scan sonar coverage. The side scan sonar records are very good quality and reveal no significant obstruction in the search area. The submerged pipe is considered disproved. It is recommended that the submerged pipe, PD be deleted from the chart. See also the memorandum titled, *Compilation for Chart 11347*, dated March 15, 1996, appended to this report.

O. COMPARISON WITH CHARTS 11341 (35th Edition, May 7/94)
11344 (30th Edition, Jan 29/94)
11347 (27th Edition, Dec 3/92)

Hydrography

The charted hydrography originates with the previously discussed prior surveys and needs no further discussion. The following should be noted:

It is recommended that the charted Dumping Ground Discontinued along the western side of the channel be deleted from the chart and soundings from the present survey be

charted in the common area.

O.3. A conflict exists between the charted controlling depths on the eastern side of the channel from Latitude 29°31'00"N to Latitude 29°35'00"N. The present survey depths range from 39 to 41 feet with a controlling depth of 42.5 feet.

O.4. The hydrographer located fifteen platforms within the limits of the present survey. Fourteen of the platforms are in proximity to charted platforms. These platforms should be retained as charted. One platform, "MO-WC-110-J", in Latitude 29°34'03.75"N, Longitude 93°10'08.39"W, is not charted. It is recommended that this platform be charted unless other information indicates otherwise. It is also recommended that the company names of the platforms not be charted to avoid chart clutter.

A charted platform, in Latitude 29°32'58"N, Longitude 93°17'40"W, is not located near any of the platforms located by the present survey and apparently no longer exists at the charted location. It is recommended that the platform be deleted from the chart unless other information indicates otherwise.

The present survey is adequate to supersede the chart in the common area.

P. ADEQUACY OF SURVEY

This is an adequate side scan sonar survey. No additional work is recommended.

S. MISCELLANEOUS

Chart compilation using the present survey was done by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division, Silver Spring, Maryland.

Information pertaining to numerous charted and uncharted items with the present survey area was forwarded to Nautical Chart Division for application to NOS chart 11347 prior to approval of the present survey. A copy of the memorandum titled *Compilation for Chart 11347*, dated March 15, 1996 and the chart history of items to be updated is appended to this report.

MT MITCHELL Processing Team

Reginald L. Keene Sr.
Cartographic Technician
Verification of Field Data

Richard H. Whitfield
Cartographer
Evaluation and Analysis

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Coast and Geodetic Survey
Norfolk, Virginia 23510-1114

March 15, 1996

MEMORANDUM FOR: Captain Andrew A. Armstrong, III, NOAA
Chief, Hydrographic Surveys Division

FROM: Commander Nicholas E. Perugini, NOAA
Chief, Atlantic Hydrographic Branch

SUBJECT: Compilation for Chart 11347

The Atlantic Hydrographic Branch (AHB) has completed initial compilation for the following chart:

Chart 11347, 27th Edition, December 3, 1994
"Calcasieu River and Lake"
1:50,000

The sources for compilation are hydrographic surveys:

H-10560
H-10561
H-10572

Although these surveys have not yet reached smooth sheet stage, AHB cartographers have identified numerous additions, deletions, and revisions that should be applied to the new chart. In order to meet the immediate chart printing schedule, AHB has compiled a "Q-Drawing" that portrays compilation results. A "Drawing History" (Form 76-71) is included with the Q-Drawing.

The following MICROSTATION "DGN" files are being transmitted by BANYAN to accompany this compilation.

11347Q10.560
11347Q10.561
11347Q10.572

In order to ensure continuity, AHB plans on performing a complete compilation using the new chart as reference, once the surveys have been approved.

NOAA FORM 76-71 (4-93) USCOMM-DC 5168-P72

DRAWING HISTORY

U.S. DEPARTMENT OF COMMERCE
NOAA NATIONAL OCEAN SERVICE
COAST & GEODETIC SURVEY

PRINT DATE | NC | RC | NE | NP | RP | TO REPRODUCTION DATE | PROOF REC'D ____ . ____ | PROOF VER ____ ____

DRAWING HISTORY | SHEET | OF | EDITION NO: | DRAWING: | CHART:

APPLIED PART	APPLIED FULL	ITEM NO	SOURCE OF INFORMATION FILE NO.	SOURCE OF INFORMATION DATE	SOURCE OF INFORMATION AUTH.	TYPE OF INFORMATION	LOCALITY (Lat./Long. and Name)
✓		1	H-10572	8-94 11-94	AWOIS 6989	PIPE	29-~~28~~-33-55.14N, 93-17-51.69W
✓		2	H-10561	8/94 10/94	AWOIS 8967	WRECK	29-39-54.00N, 93-17-12.00W
						OBSTN	29-37-21.48N, 93-17-48.39W
						OBSTN	29-36-12.17N, 93-17-54.01W
						OBSTN	29-40-26.022N, 93-19-28.00W
						OBSTN	29-37-30.86N, 93-18-47.04W
						OBSTN	29-35-08.53N, 93-22-04.16W
					AWOIS 8967	WRECK	29-39-54.596N, 93-18-07.857W
						OBSTN	29-39-19.75N, 93-20-11.80W
~~✓~~		~~3~~	H-10560	~~8/94 11/94~~		OBSTN	29-38-38.08N, 93-19-34.26W
✓		3	H-10560	8/94 11/94	AWOIS 1327	OBSTN	29-44-35.42N, 93-20-22.24W
					AWOIS 1327	OBSTN	29-44-24.60N, 93-20-19.50W
					AWOIS 1327	OBSTN	29-44-05.31N, 93-20-~~09~~-16-09.70W
					AWOIS 1327	NOTE	29-43-25.72N, 93-20-09.71W
					AWOIS 1327	PILE	29-44-16.11N, 93-20-18.25W
					AWOIS 1327	PILE	29-41-20.3N, 93-19-47.8W
					AWOIS 8934	WRECK	29-45-00.80N, 93-18-00.55W
					AWOIS 8931	WRECK	29-43-00.60N, 93-19-~~00~~-30-00.55W
					AWOIS 8932	WRECK	29-44-42.80N, 93-20-18.55W
					AWOIS 8935	WRECK	29-44-30.80N, 93-21-42.55W
					AWOIS 8968	OBSTN	29-45-05.80N, 93-20-37.55W
					AWOIS 8930	WRECK	29-45-38.80N, 93-19-03.54W
					AWOIS 8933	WRECK	29-45-00.80N, 93-21-00.55W
					AWOIS 8964	WRECK	29-45-01.80N, 93-21-04.55W
						WRECK	29-45-00.75N, 93-17-40.99W
						OBSTN	29-40-52.314N, 93-20-07.463W
						OBSTN	29-43-06.414N, 93-21-58.133W
						OBSTN	29-44-38.644N, 93-20-34.196W
						OBSTN	29-44-~~44~~.64N, 93-20-37.88W

NOTICE TO MARINERS (FWD) | SOURCE DATA (FWD) | REMARKS

CHART 11347

(PROOF) | (PROOF)

INFORMATION APPLIED	START DATE	COMPILER (Signature)	REVIEWER (Signature)	COMP DATE
DELETE SUBM PIPE PD 0	3/13/96	[illegible]	R. Koe	3/14/96
DELETE (4): PA	3/13/96	[illegible]	R. Koe	3/14/96
DELETE (33): Obstn REP (1990)	3/13/96	[illegible]	R. Koe	3/14/96
DELETE (33): Obstn REP (1990)	3/13/96	[illegible]	R. Koe	3/14/96
REVISE (): OBSTN PA (24.6 FT REP) TO (28) Obstn	3/13/96	[illegible]	R. Koe	3/14/96
REVISE (): OBSTN PA (31 FT REP) TO (31): OBSTN	3/13/96	[illegible]	R. Koe	3/14/96
REVISE (4): PA (32 FT REP) TO (31): Obstn	3/13/96	[illegible]	R. Koe	3/14/96
REVISE (4): PA (13½ FT REP) TO (12): WK	3/13/96	[illegible]	R. Koe	3/14/96
ADD (26): OBSTN	3/13/96	[illegible]	R. Koe	3/14/96
ADD (25): OBSTN	3/13/96	[illegible]	R. Koe	3/14/96
DELETE (25): OBSTN'S REP 1990	3/13/96	[illegible]	R. Koe	3/14/96
DELETE (22): Obs	3/13/96	[illegible]	R. Koe	3/14/96
DELETE (21): OBSTN REP 1990	3/13/96	[illegible]	R. Koe	3/14/96
DELETE REP 1990	3/13/96	[illegible]	R. Koe	3/14/96
DELETE 0 SUBM PIPE	3/13/96	[illegible]	R. Koe	3/14/96
DELETE 0 SUBM PILE	3/13/96	[illegible]	R. Koe	3/14/96
DELETE (4): PA	3/13/96	[illegible]	R. Koe	3/14/96
DELETE (4): PD	3/13/96	[illegible]	R. Koe	3/14/96
DELETE (4): (REP 1993)	3/13/96	[illegible]	R. Koe	3/14/96
DELETE (): Obstn PA	3/13/96	[illegible]	R. Koe	3/14/96
DELETE / OBSTN REP	3/13/96	[illegible]	R. Koe	3/14/96
REVISE ~~DELETE~~ PA TO (4): PA	3/13/96	[illegible]	R. Koe	3/14/96
REVISE PA TO (4): PA	3/13/96	[illegible]	R. Koe	3/14/96
REVISE PA TO (4): PA	3/13/96	[illegible]	R. Koe	3/14/96
REVISE (4): PA (9 FT REP) TO (8): WK	3/13/96	[illegible]	R. Koe	3/14/96
REVISE (): Obstn PA TO (9): Obstn	3/13/96	[illegible]	R. Koe	3-14-96
REVISE (): OBSTN PA (10-½ FT REP) TO (8): OBSTN	3/13/96	[illegible]	R. Koe	3-14-96
ADD (15): Obstn	3/13/96	[illegible]	R. Koe	3-14-96
ADD (): Obstn	3/13/96	[illegible]	R. Koe	3-14-96

DRAWING HISTORY

APPLIED PART	APPLIED FULL	ITEM NO.	SOURCE OF INFORMATION FILE NO.	SOURCE OF INFORMATION DATE	SOURCE OF INFORMATION AUTH.	TYPE OF INFORMATION	LOCALITY (Lat./Long. and Name)
						Obstn	29-44-37.190 N, 93-20-32.295
						Obstn	29-44-11.10 N, 93-20-29.11 W

INFORMATION APPLIED	START DATE	COMPILER (Signature)	REVIEWER (Signature)	CONF DATE
ADD (21) Obstn	3/13/96	[illegible]	R. [illegible]	3-14-96
ADD (8) Obstn	3/13/96	[illegible]	R. [illegible]	3-14-96

APPROVAL SHEET
H-10572

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disproval of charted data. The digital data have been completed and all revisions and additions made to the smooth sheet during survey processing have been entered in the digital data for this survey. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Robert G. Roberson Date: APRIL 16, 1996
Robert G. Roberson
Cartographer
Chief, Cartographic Section

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Nicholas E. Perugini Date: April 16, 1996
Nicholas E. Perugini, CDR, NOAA
Chief, Atlantic Hydrographic Branch

****

Final Approval:

Approved: Andrew A. Armstrong III Date: Mar 7, 1997
Andrew A. Armstrong, III
Captain, NOAA
Chief, Hydrographic Surveys Division

NOAA FORM 75-96
(10-83)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10572

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
11347	12/29/96	[signature]	Full ~~Part~~ ~~Before~~ After Marine Center Approval Signed Via
			Drawing No.
11344	1/14/97	[signature]	Full ~~Part~~ ~~Before~~ After Marine Center Approval Signed Via FULL APPLICATION
			Drawing No. THROUGH 11347
11341	1/14/97	[signature]	Full ~~Part~~ ~~Before~~ After Marine Center Approval Signed Via FULL APPLICATION
			Drawing No. THROUGH 11347
11340	3/29/97	JEFF TAYLOR	~~Full~~ Part ~~Before~~ After Marine Center Approval Signed Via EXAMINED FOR CRITICAL
			Drawing No. ~~CRITICAL~~ APPL. ONLY
11345	6/30/97	[signature]	Full Part Before After Marine Center Approval Signed Via
			Drawing No. Full application thru 11341 & 11344
11330	7/10/97	Travis Ahn	Full ~~Part~~ ~~Before~~ After Marine Center Approval Signed Via
			Drawing No. thru charts 11341, 11344 and 11345
11340	7/10/97	Travis Ahn	Full ~~Part~~ ~~Before~~ After Marine Center Approval Signed Via
			Drawing No. thru 11330
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.