# H-10393

Diagram No. 1266-3

NOAA Form 78-35A

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service

## Descriptive Report

<table>
<thead>
<tr>
<th>Type of Survey</th>
<th>Side Scan Sonar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field No.</td>
<td>HE-10-1-91</td>
</tr>
<tr>
<td>Registry No.</td>
<td>H-10393</td>
</tr>
</tbody>
</table>

## Locality

<table>
<thead>
<tr>
<th>State</th>
<th>Alabama</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Locality</td>
<td>Gulf of Mexico</td>
</tr>
<tr>
<td>Sublocality</td>
<td>Entrance to Main</td>
</tr>
<tr>
<td></td>
<td>Ship Channel</td>
</tr>
<tr>
<td></td>
<td>1991</td>
</tr>
</tbody>
</table>

### Chief of Party

LCDR J.W. Blackwell

## Library & Archives

| Date            | April 14, 1993                |

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*U.S. Gov. Printing Office: 1985-566-054*
State: ALABAMA

General locality: GULF OF MEXICO

Locality: ENTRANCE TO MAIN SHIP CHANNEL

Scale: 1:10,000

Date of survey: Aug. 13 – Sep. 9, 1991

Instructions dated: June 11, 1991

Project No.: OPR-J461-HE

Vessel: NOAA Ship HECK (EDP 9140)

Chief of party: JOHN W. BLACKWELL, LCDR, NOAA

Surveyed by: LCDR Blackwell, LT Moeller, LTJG Harbison, ENS Martin, ST Morris

Soundings taken by echo sounder: [signature]

Graphic record scaled by LT Moeller, LTJG Harbison, ENS Martin, ST Morris

Graphic record checked by LT Moeller

Protracted by: N/A

Automated plot by: HDAPS (FIELD)

Verification by: Atlantic Hydrographic Section, N/C/CG244

Soundings in: METERS

Sound at: MLLW

REMARKS: Change 1 dated July 12, 1991

All times UTC

Notes in the Descriptive Report were made in red during office processing.

AQWSIS: SURF 6/1/93 SD
DESCRIPTIVE REPORT APPENDICES

I. DANGER TO NAVIGATION REPORTS

II. NON-FLOATING AIDS AND LANDMARKS FOR CHARTS

III. LIST OF HORIZONTAL CONTROL STATIONS

IV. GEOGRAPHIC NAMES (FIELD)

V. TIDES AND WATER LEVELS

VI. SUPPLEMENTAL CORRESPONDENCE

VII. APPROVAL SHEET

SEPARATES TO BE INCLUDED WITH SURVEY DATA

I. HYDROGRAPHIC SHEETS AND PARAMETERS

II. BOTTOM SAMPLES

III. HORIZONTAL POSITION CONTROL AND CORRECTIONS TO POSITION DATA

IV. SOUNDING EQUIPMENT CALIBRATIONS AND CORRECTIONS

V. SIDE SCAN SONAR DATA

IV. ITEM INVESTIGATION DATA

*Filed with original survey records.
A. PROJECT

This survey was conducted in accordance with Hydrographic Project Instructions OPR-J461-HE, Approaches to Mobile Bay, Alabama, dated June 11, 1991, and Change 1 dated 12 July 91.

The purpose of this project is to provide updated information in response to requests by the Mobile Bar Pilots Association to investigate submerged obstructions in the area.

B. AREA SURVEYED

The survey area, designated Sheet B in the Project Instructions, lies in the Gulf of Mexico south of the entrance to Mobile Bay. The actual survey area is an irregular polygon formed by connecting, in order, the following points:

1. LAT 30°06'36"N  LON 088°08'27"W
2. LAT 30°08'30"N  LON 088°08'27"W
3. LAT 30°10'01"N  LON 088°07'43"W
4. LAT 30°10'31"N  LON 088°05'12"W
5. LAT 30°08'48"N  LON 088°03'30"W
6. LAT 30°09'48"N  LON 088°01'19"W
7. LAT 30°09'19"N  LON 088°01'08"W
8. LAT 30°06'36"N  LON 088°01'08"W

Survey operations began on August 13, 1991 (DOY 225), and were completed on September 8, 1991 (DOY 250).

The size of the survey area exceeded the width constraint of the HECK's plotter and required that the area be split into a north (sheet 03) and south (sheet 02) sheet. The contours and vessel traffic required that the survey be run using north-south lines. In order to prevent HECK from needing to constantly switch sheets a single 1:15,000 scale boat sheet (sheet 01) was used for on-line surveying. All data was gathered and processed using 1:10,000 scale specifications and submitted on 1:10,000 scale smooth plots.
C. SURVEY VESSELS

All hydrographic data were collected by the NOAA Ship HECK (EDP 9140). No unusual vessel configurations were used.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Survey data acquisition and processing were accomplished utilizing the HDAPS system hardware and the latest version of the NAVITRONIC NAVISOFT 300 software provided to the ship by N/CG24. A listing of actual programs and versions is appended in Section VI.

E. SONAR EQUIPMENT

HECK is equipped with an EG&G model 260 slant range corrected Side Scan Sonar (SSS) recorder and model 272 dual frequency towfish. Serial numbers and dates of usage are as follows:

<table>
<thead>
<tr>
<th>Towfish</th>
<th>S/N 10823</th>
<th>DOY 225 - 252</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recorder</td>
<td>S/N 012104</td>
<td>DOY 225 - 252</td>
</tr>
</tbody>
</table>

The beam width and down angle are not adjustable on this unit. All mainscheme SSS data was collected using the 100 meter range scale and 100 KHz frequency. 75 and 50 meter range scale 100 KHz was used for contact investigation. Mainscheme line spacing of 170 meters was used to assure the required 2mm of adjacent line overlap. 200% coverage was attained over the entire survey area. Do not concur. See Section 4.C. of the Evaluation Report.

Confidence checks were obtained, and annotated on the sonograms, by towing the side scan unit either past known items or linear bottom features. A minimum of two confidence checks were obtained on a daily basis as required.

Required proof of sonar coverage is demonstrated through the included sonar coverage plots. The hydrographer chose this method in lieu of the sonar coverage abstract. The choice of method is left to the hydrographer per Side Scan Sonar Manual section 3.1.3.

The sonar contact list (Side Scan Sonar Manual 3.1.1.1.) is provided through the HECK's modified contact abstract table and the HDAPS contact table printouts. Both are located in the separates.

Three contact tables were used during this survey. In order to prevent confusion all items were identified using their position number. Some contacts have more than one number due to successive hits during 200% coverage, developments, and detached positions. In this case the targets plotted on top of each other, however, the recommended charting positions were derived from their DP's.
F. SOUNDING EQUIPMENT

The following Raytheon DSF-6000N echosounders were used during this survey:

S/N A110N    DOY 225 - 232, 238 - 252
S/N A107      DOY 232 - 234

Both low and high frequency depths were digitized, but only high frequency depths were plotted.

G. CORRECTIONS TO ECHOSOUNDINGS

The following table shows dates and locations of velocity casts conducted using the ODOM Digibar sound velocimeter (S/N 168):

<table>
<thead>
<tr>
<th>VELOCITY TABLE</th>
<th>DATE</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>08/13/91 (DOY 225)</td>
<td>30°05'36&quot;N 088°02'00&quot;W</td>
</tr>
</tbody>
</table>

The velocity cast data were reduced and velocity corrections calculated using program VELOCITY. The computed velocity correctors were then applied on line to echosounder depths (both high and low frequency) by entering the correction data into the HDAPS sound velocity table. A second velocity cast was performed on DOY 253. There was minimal change in velocity correctors between these two casts, therefore, the 27 day period between cast 1 and the last days data created no problem.

The Digibar used was checked on March 5, 1991 by ODOM and found to be functioning correctly. Field checks using the prescribed fresh water method were accomplished prior to each cast and recorded on the velocity cast form.

On DOY 108 a dual leadline comparison was conducted and resulted in a mean difference of 0.040 meter or a corrector of 0.0 meter.

The static draft of 2.10 meters was applied on line to all echosoundings via the HDAPS offset table.

Settlement and squat correctors for the HECK were determined on March 13, 1991 (DOY 72), in the vicinity of Craney Island fuel pier in Norfolk, Virginia using the level rod method. Settlement and squat values were applied on line to hydrographic soundings via the HDAPS offset table.

Heave is measured by a Datawell B.V. (S/N 19110-C) heave, roll, and pitch sensor (HIPPY) located midships near the transducer. The sensor gathers on line data which is applied to the soundings in near real time. All data have been corrected by applying HIPPY correctors.
The tidal datum for this survey was mean lower low water (MLLW). The tide station at Dauphin Island, Alabama was the reference station for this survey. The station was maintained under contract by Chapin and Assoc. and observed by Mike Dardue. Contact with the observer was made and the station inspected and opening levels run by HECK's crew members. No tide stations were established by the HECK in support of this survey.

All hydrographic depths have been corrected for predicted tides using the zone correctors specified in the project instructions. Tidal correctors were applied on line via the HDAPS predicted tide table. Approved tides and zoning were applied during office processing.

H. CONTROL STATIONS See also Section 2.a. of the Evaluation Report.

The horizontal datum for this project is the North American Datum of 1983 (NAD 83). Four existing stations were recovered by HECK personnel. Those stations were:

<table>
<thead>
<tr>
<th>Number</th>
<th>Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>DAUPHIN ISLAND WEST BASE, 1987</td>
</tr>
<tr>
<td>102</td>
<td>PIRATE, 1986</td>
</tr>
<tr>
<td>103</td>
<td>MOBILE POINT LIGHT, 1987</td>
</tr>
<tr>
<td>104</td>
<td>STORMY, 1986</td>
</tr>
</tbody>
</table>

Positions for PIRATE, STORMY, and MOBILE POINT LIGHT were obtained from N/CG23322.

A list of the horizontal control stations appears in appendix III, LIST OF HORIZONTAL CONTROL STATIONS submitted with this survey. appended to this report.

I. HYDROGRAPHIC POSITION CONTROL See also Section 2.a. of the Evaluation Report.

Position control was multiple LOP, utilizing Motorola Mini-Ranger shore stations. Control station positions were entered into the HDAPS Control Station Tables. (See APPENDIX III, LIST OF HORIZONTAL CONTROL STATIONS). The appropriate Mini-Ranger codes were attached to the station number on this table. Each time the survey navigation configuration was altered, the control station and C-O tables were modified to reflect the correct Mini-Ranger code placement and DOY 220 Baseline Corrector values.

Equipment serial numbers appear as part of the header information on each day's data printout. The Falcon remote units are identified by their position and code numbers. System checks were conducted in accordance with the Field Procedures Manual and appear as HDAPS screen dumps on the data printouts.

All survey offsets (ie. Antenna-to-Towpoint) were applied on-line using the HDAPS Offset Table number 1 (copy in Section III & IV).
This survey was required to meet 1:10,000 scale accuracy requirements, at no time did the maximum residual consistently exceed 5 meters nor did the 95% confidence ECR consistently exceeded 15 meters. Data not meeting these requirements were examined and high residuals either accepted or smoothed and high ECR's smoothed or rejected.

J. SHORELINE See also section 2.b. of the Evaluation Report

Not applicable as per project instructions.

K. CROSSLINES See also section 3.a. of the Evaluation Report

33.0 miles of crosslines were run on this survey and they represent 7.1% of all hydrography. Comparison to mainscheme soundings showed good agreement with random differences of ± 0.2 meters. One small area of poor agreement is from fix 1864 to 1868 were an irregular bottom caused differences of one meter.

L. JUNCTIONS See also section 5. of the Evaluation Report.

Not applicable.

M. COMPARISON WITH PRIOR SURVEYS See also sections 6.a. and 6.b. of the Evaluation Report.

Comparisons were made to prior survey H-10226, 1986-88, 1:20,000; surveyed by HFP-1, LTJG David W. Moeller, Officer-in-Charge.

Except for the two following areas comparisons showed excellent agreement with the majority of survey soundings agreeing within two feet of the prior survey. The first area is in the dump site where present depths of 18 feet lie in what once was depths of 42 feet (Notice to Mariners submitted). This pile of dredge spoil has caused the shoaling of the area surrounding it and may eventually cause some shoaling of the adjacent fairway area as it spreads. The second area of differences is in the vicinity of the channel were dredging activity has deepened the channel to 48 feet versus the prior surveys 44 feet.

Seven AWOIS items originate with this survey; 7330, 7338, 7339, 7340, 7341, 7342, and 7343. Only Awois items 7330, 7338, 7340, and 7341 are presently charted. All of these items are echosounder depths labeled as obstructions by AMC verification. 200% side scan coverage of the area around these items showed no indication of these obstructions. It is recommended that all seven items be considered disproved and the four charted items be deleted from the chart. Concor
Comparison of surveyed soundings were made to NOS chart 11376, 41st edition, Mar. 16/91. The soundings, with the exception of the dump site area, agreed well with the charted soundings consistently 0 to 2 feet shoaler than the survey.

One danger to navigation report was submitted as a result of this survey. Copies were forwarded to DMAHTC and N/CG221.

Seventy five (75) contacts were identified during this survey. Fifteen (15) targets were identified as warranting additional investigation based on either their height off the bottom or their appearance. All such contacts were investigated with additional side scan coverage and/or divers. The following is the list of targets with associated investigation results and recommendations:

**POSITION**

**8.52**
Additional SSS development Pos. 2588-95, Nothing found.

**61.21**
Additional SSS development Pos. 2596-2600, Nothing found. Do not Concur. A 14.7 Obstr (A) and 14.3 Obstr (A) found by present survey. Ad. Wel. was done. See section 7.a.1) of the Evaluation Report.

**210.07**
Additional SSS development Pos. 2571-6, Nothing found.

**228.51**
Additional SSS development Pos. 2605-8, Nothing found.

**469.45**
Additional SSS development Pos. 2611-6, Insignificant contact.

**Recommendation:** This item is non-dangerous and should not be charted. Concur. Located near gas well "Exxon-114-868-1"

**471.75**
Additional SSS development Pos. 2550-3, Nothing found.

**512.53**
Additional SSS development Pos. 2609-10, Nothing found.

**554.66**
Additional SSS development Pos. 2546-9, Nothing found.

**556.13**
Additional SSS development Pos. 2542-5, Nothing found. Phot side scan Survey Records. 10.8 Obstr on sheet. See also Section 7.a.2) of the Evaluation Report.

**958.22**
Additional SSS development Pos. 2580-3, Nothing found.

**1041.51**
Additional SSS development Pos. 2584-7, 2615-7, Dive investigation. Divers found several 12" diameter metal pipes lying flat on the bottom. This item is most likely a load of drilling pipe lost by one of the many supply boats that transit the area. No least depth obtained.

**Recommendation:** This item does not present a hazard to navigation and should not be charted. Do not Concur. Chart 17 Obstr (pipe) as shown on the present survey. See also Section 7.a.2) of the Evaluation Report.
Additional SSS development Pos. 2554-9, Nothing found.

Additional SSS development Pos. 2601-4, Nothing found. Do not concur. See Section 7.4 of the Evaluation Report.

Additional SSS development Pos. 2689-92, Nothing found.

Additional SSS development Pos. 2685-88, Nothing found.

Several AWOIS items lie within the boundaries of this survey. All items appear only on NOS chart 11376, 41st edition, Mar. 16/91. The results of their investigation are as follows:

3642 - Anchor fluke extending 2 feet off of the bottom cleared by 34 feet. 100% side scan coverage was accomplished with no indication of its existence found. The original survey, H-9374/73WD considered this item to be non-hazardous and according to the present criteria it would be considered insignificant. The item is considered disproved. Delete Obstruction charted at 30°08'16.93"N 088°05'10.19"W. Concur

3644 - 28 foot shoal reported LNM10/73, wire dragged to 35FT (0.5 mile radius) 1973, wire dragged to 41 FT 1974, echosounder development (50 m line spacing, 1000 meter radius) 1986-88, presently charted as an obstruction cleared to 41 feet. 200% side scan coverage, reduced from S4 to S2 by N/C G241, was attained over the entire search area, no indications of either a shoal or obstruction that would have caused the originally reported sounding were found. The item is considered disproved. Delete Obstruction charted at 30°08'00.73"N 088°05'23.99"W. Concur

3647 - Obstruction cleared 50FT, 400% SSS coverage was accomplished with no indication of the obstruction. This item is considered disproved. Delete Obstruction charted at 30°07'36.73"N 088°04'06.99"W. Concur

3648 - 58 ft shoal/grounding on wire drag H-9374, 55ft cleared. Survey depths for this items search area range from 59 to 61 feet, therefore, the original 58 foot wire grounding is highly probable. No obstruction was found within this items search area. The item is considered disproved. Delete Sounding charted at 30°07'25.74"N 088°03'10.99"W. Concur.

3627 - Obstruction, Fish Haven. This item lies along the 60ft contour westward from 088°03'30"W to 088°12'00"W. No AWOIS listing of this item was provided by N/C G241, however, it is believed to have been originally reported as a string of car bodies. No indication of the items associated with this fish haven were found. Discussions with local residents and further research by N/C G241 indicates the planned deployment of this fish haven was never accomplished.
and that it was charted in error. The item is considered disproved within the boundaries of this survey and should be deleted from this portion of the chart. Concur. See also section 7.4 of the Evaluation Report.

O. ADEQUACY OF SURVEY

This survey has met or exceeded 1:10000 specifications, and is adequate to supersede all prior surveys for the purposes of charting the depths and hazards to navigation within the survey area.

P. AIDS TO NAVIGATION

See also section 7.4.1 of the Evaluation Report.

Five floating aids to navigation are located in the area of this survey. They are buoys R W "M", G "1", R "2", G "3", and R "4" of the Main Ship Channel. The surveyed positions (positions determined by side scan and logged on contact table 4) of these aids matched their charted location. They accurately mark the ship channel and no modifications are recommended.

Three unlighted mooring were located within the survey area. Two of these buoys were associated with drilling activity on the sheet and were removed prior to the end of operations and should not be charted. The mooring buoy located at Pos. 1596.20, 30°09'51.4"N 088°06'45.8"W was not associated with a drill platform and it is recommended for charting. Concur.

A W Or Privately Maintained buoy is presently charted at 30°06'18"N 088°08'00"W. No indication of this buoy was observed. It is recommended it be deleted from the chart. Concur.

Q. STATISTICS

<table>
<thead>
<tr>
<th>ITEM</th>
<th>for...</th>
<th>NOAA Ship HECK</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Total No. of Positions</td>
<td></td>
<td>2692</td>
<td>Fixes</td>
</tr>
<tr>
<td>2. Lineal NM of Soundings</td>
<td></td>
<td>498.8</td>
<td>NMi</td>
</tr>
<tr>
<td>3. Square NM Hydrography</td>
<td></td>
<td>17.9</td>
<td>NMi²</td>
</tr>
<tr>
<td>4. Days of Production</td>
<td></td>
<td>11</td>
<td>Days</td>
</tr>
<tr>
<td>5. Bottom Samples</td>
<td></td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>6. Tide Stations Established</td>
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<td>None</td>
<td></td>
</tr>
<tr>
<td>7. Current Stations Established</td>
<td></td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>8. Velocity Casts Performed</td>
<td></td>
<td>1</td>
<td>Casts</td>
</tr>
<tr>
<td>9. Magnetic Stations Established</td>
<td></td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>10. Detached Positions</td>
<td></td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
R. MISCELLANEOUS

No anomalies in either tide or current were noted. The survey area had been fully bottom sampled on the prior survey, therefore, only fourteen bottom samples were taken and a Log Sheet M (copy appended) submitted to the Smithsonian Institution. The bottom sample characteristics found agreed well with those of the prior survey.

The confusion concerning the geographic names Sand Island and Pelican Island referred to in section 4.3. of the project instructions is due to the changeable nature of the area. According to Mr. Clinton Collier, longtime resident of Dauphin Island, two islands once existed south of Dauphin Island. Sand Island was the eastern most and had Sand Island Lighthouse and a Coast Guard station built on it. Old photographs of the Coast Guard station at the base of the light are displayed in the Sea Galley, a local Restaurant. Pelican Island lay to the west-northwest of Sand Island in approximately the same position as the single island that is presently charted. Over time both islands migrated to the northwest. Pelican Island eventually merged with Dauphin Island. Sand Island's movement forced the Coast Guard to abandon its station and lighthouse. The ruins of the lighthouse and its rock foundation remain. Sand Island continued to migrate to the northwest and now occupies the former location of Pelican Island. A review of the various prior surveys of the entrance to Mobile Bay will verify this information. It is referred to locally as Sand Island and it is recommended that the charted geographic name "Sand Island" be retained.

S. RECOMMENDATIONS

The amount of dredge material that has been recently dumped due to the deepening of the channel could cause shoaling to occur within the fairways adjacent to the dump site. The Corps of Engineers should be contacted and informed that a periodic monitoring of the fairways for shoaling is warranted.

The complete insonification of the survey area via echosounder and side scan sonar (200% coverage) is such that the data from this survey should supersede all charted depths and features presently charted within the survey area.

Recommendations concerning specific items, depths, geographic names, and aids are located in sections M, N, P and R of this report.
T. REFERRAL TO REPORTS

Electronic Corrector Report, OPR-J461-HE, Included with this survey.

Respectfully Submitted,

David W. Moeller, LT, NOAA
Executive Officer
NOAA Ship HECK

Approved and Forwarded,

Kevin N. Harbison, LTJG, NOAA
Field Operations Officer
NOAA Ship HECK
DESCRIPTIVE REPORT TO ACCOMPANY
SURVEY H-10393
ADDITIONAL WORK
FIELD NUMBER HE-10-3-91
ALABAMA
GULF OF MEXICO
ENTRANCE TO MAIN SHIP CHANNEL
Scale 1:10,000
NOAA SHIP HECK S-591
LCDR John W. Blackwell, NOAA, CMDG

A. PROJECT

This survey was conducted in accordance with Hydrographic Project Instructions OPR-J461-HE, Approaches to Mobile Bay, Alabama, dated February 18, 1992, and Change 1 dated April 2, 1992.

The purpose of this project is to accomplish complete 200-percent side scan sonar coverage of the safety fairway and the fairway anchorages at the approaches to Mobile Bay, Alabama, and to investigate a number of wrecks and obstructions in or near the safety fairway. This project responds to requests by the Mobile Bar Pilots Association concerning the presence of submerged obstructions in the area. Change 1 requires additional work on unresolved items found during the preprocessing examination of H-10393.

B. AREA SURVEYED

The survey area consisted of four item investigations in the H-10393 survey area. The items were at the following positions:

<table>
<thead>
<tr>
<th>Item</th>
<th>Latitude</th>
<th>Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>9000</td>
<td>30°08'04.76&quot;N</td>
<td>088°03'53.06&quot;W</td>
</tr>
<tr>
<td>9001</td>
<td>30°08'06.67&quot;N</td>
<td>088°03'50.61&quot;W</td>
</tr>
<tr>
<td>9002</td>
<td>30°08'25.29&quot;N</td>
<td>088°04'50.33&quot;W</td>
</tr>
<tr>
<td>9003</td>
<td>30°09'53.80&quot;N</td>
<td>088°07'31.28&quot;W</td>
</tr>
</tbody>
</table>

Survey operations began on May 1, 1992 (DOY 122), and were completed on May 11, 1992 (DOY 132).

The HECK collected data for these items on page size boat sheets. Three boat sheets were used. Items 9000 and 9001 are on sheet 05. Item 9002 is on sheet 06. Item 9003 is on sheet 07. All data was gathered and processed using 1:10,000 specifications and submitted on 1:10,000 scale page plots.
C. SURVEY VESSELS

All hydrographic and side scan data were collected by the NOAA Ship HECK (EDP 9140). All offset and layback information is contained in the offset table located in section IV* of the separates. No unusual vessel configurations were used.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Survey data acquisition and processing were accomplished utilizing the HDAPS system hardware and the latest version of the NAVITRONIC NAVISOFT 300 software provided to the ship by N/CG24. A listing of actual programs and versions can be found in appendix VI.*

The velocity cast data were reduced and velocity corrections calculated using program VELOCITY Version 1.11.

No unusual automated acquisition or processing methods were used.

E. SONAR EQUIPMENT

HECK is equipped with an EG&G model 260 slant range corrected Side Scan Sonar (SSS) recorder and model 272 single frequency towfish. Serial numbers and dates of usage are as follows:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Towfish</td>
<td>S/N 011901</td>
<td>DOY 122 - 132</td>
</tr>
<tr>
<td>Recorder</td>
<td>S/N 012106</td>
<td>DOY 122 - 132</td>
</tr>
</tbody>
</table>

The beam width and down angle are not adjustable on this unit. All SSS data was collected using the 50 and 75 meter range scales and 100 Khz frequency. The sidescan towfish was deployed off the stern. All offset and layback information is provided in the offset table located in section IV of the separates.*

Confidence checks were obtained, and annotated on the sonargrams, by towing the side scan unit either past known items or linear bottom features. A minimum of two confidence checks were obtained on a daily basis as required.

In general the quality of sonargrams on these investigations was good. There were some instances where sea return or low reflectivity bottom degraded the sonar trace. These degraded traces were reviewed and either deemed to be adequate or rejected.

The side scan sonar contact list (Side Scan Sonar Manual 3.1.1.1.) is provided through the HECK's side scan sonar abstract and the automated HDAPS contact printout that is produced during the computation and logging of contacts. Both are located in the separates.*

* Filed with the original survey records.
One contact table was used during this survey. In order to prevent confusion all items were identified using their position number. Some contacts have more than one target number from successive hits during developments, and detached positions. In this case the targets plotted on top of each other, however, the recommended charting positions were derived from their DP's.

Annotations required by section 2.6 of the Side Scan Sonar manual; ship's speed, ship's head, weather/sea state (heave) are not placed on the sonargrams. This information is all located in the digital records and can be examined using the "List Data" sub-routine located in post-survey of HDAPS. This information is also displayed in the "Depth/Position Edit" sub-routine of post-survey.

F. SOUNDING EQUIPMENT

The following Raytheon DSF-6000N echosounder was used during this survey:

S/N A107N       DOY 122 - 132

Both low and high frequency depths were digitized, but only high frequency depths were plotted.

All data was collected using the automatic gain setting on the DSF-6000. There were no unusual problems with the echosounder.

Weather logs for all periods of hydrography are included in Appendix VI.

Heave information is recorded digitally from the Hippy and the heave corrector is applied on line. Ship's head and speed are recorded digitally.

G. CORRECTIONS TO ECHOSOUNDINGS

One velocity cast was conducted using the ODOM Digibar sound velocimeter (S/N 168):

<table>
<thead>
<tr>
<th>DATE</th>
<th>DOY</th>
<th>POSITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 14, 1992</td>
<td>120</td>
<td>30°00'30&quot;N 087°57'18&quot;W</td>
</tr>
</tbody>
</table>

The velocity cast data were reduced and velocity corrections calculated using program VELOCITY Version 1.11. The computed velocity correctors were then applied on line to echosounder depths (both high and low frequency) by entering the correction data into the HDAPS sound velocity table.

The digibar was checked on November 1, 1991 by ODOM and found to be performing within specifications. Field checks using the
prescribed fresh water method were accomplished prior to each cast and recorded on the velocity cast form.

On DOY 115 a dual leadline comparison was conducted and resulted in a mean difference of 0.060 meter or a corrector of 0.0 meter.

The static draft of 2.10 meters was applied on line to all echosoundings via the HDAPS offset table.

Settlement and squat correctors for the HECK were determined on March 13, 1991 (DOY 72), in the vicinity of Craney Island fuel pier in Norfolk, Virginia using the level rod method.

Settlement and squat values were applied on line to hydrographic soundings via the HDAPS offset table located in section IV of the separates. Filed with the original survey records.

Heave is measured by a Datawell B.V. (S/N 19110-C) heave, roll, and pitch sensor (HIPPY) located midships near the transducer. The sensor gathers on line data which is applied to the soundings in near real time. All data have been corrected by applying HIPPY correctors.

In situations where the HIPPY locked up, selected soundings were scanned and depths edited to remove the heave error.

The tidal datum for this survey was mean lower low water (MLLW). The tide station at Dauphin Island, Alabama (873-5180) was the reference station for this survey. The station was maintained under contract by Chapin and Assoc, and observed by Mike Dardeau. Contact with the observer was made, the station was inspected, and opening levels were run by HECK's crew. No tide stations were established by HECK in support of this survey.

All hydrographic depths have been corrected for predicted tides using the zone correctors specified in the project instructions. Tidal correctors were applied on line via the HDAPS predicted tide table. Approved tides and zoning were applied during office processing.

H. CONTROL STATIONS

The horizontal datum for this project is the North American Datum of 1983 (NAD 83). Four existing stations were recovered by HECK personnel. Those stations were:

<table>
<thead>
<tr>
<th>Number</th>
<th>Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>103</td>
<td>MOBILE POINT LIGHT, 1987</td>
</tr>
<tr>
<td>104</td>
<td>STORMY, 1986</td>
</tr>
<tr>
<td>105</td>
<td>ELANA, 1984</td>
</tr>
<tr>
<td>106</td>
<td>DAUPHIN ISLAND USAF E DOME</td>
</tr>
</tbody>
</table>
Positions for MOBILE POINT LIGHT, STORMY, ELANA and DAUPHIN ISLAND USAF E DOME were obtained from N/CG23322 Coastal Surveys Unit.

A list of the horizontal control stations appears in appendix III, LIST OF HORIZONTAL CONTROL STATIONS submitted with this survey.

I. HYDROGRAPHIC POSITION CONTROL See also section 2.a. of the Evaluation Report.

Position control was multiple LOP, utilizing Motorola Mini-Ranger Falcon 484 shore stations. Control station positions were entered into the HDAPS Control Station Tables. (See appendix III, LIST OF HORIZONTAL CONTROL STATIONS).

Equipment serial numbers appear as part of the header information on each day's data print out. The Falcon remote units are identified by their position and code numbers.

Baseline calibration information can be found in the Electronic Control Report submitted with H-10418. One C-0 table was used for these investigations survey.

System checks were conducted in accordance with the Field Procedures Manual and appear as HDAPS screen dumps on the data printouts.

All survey offsets were applied on-line using the HDAPS Offset Table number 1.

At no time during this project did the maximum residual consistently exceed 0.5 mm at the survey scale (5 meters) nor did the 95% confidence ECR consistently exceeded 1.5 mm at the survey scale (15 meters). Data not meeting these requirements were examined and high residuals either accepted or smoothed and high ECR's rejected.

J. SHORELINE

Not applicable as per project instructions. Concur

K. CROSSLINES

Not applicable as per project instructions. Concur

L. JUNCTIONS

Not applicable as per project instructions. Concur
M. COMPARISON WITH PRIOR SURVEYS

The following items were identified as requiring additional work during the preprocessing review of H-10393.

9000
This target was identified during survey H-10383 as contact number 61.07. It was determined to be significant during the preprocessing review of the survey. On DOY 122 and 126 an echosounder development found a least depth of 15.1 meters in surrounding depths of 16.3 meters.

N: 14943.8 E: 20170.5
LAT 30°08'05.314" LON 088°03'53.630"

Recommendation: This item is insignificant and should not be charted. Do not Concur. Chart as 15° Obst as shown on the present survey.

9001
This target was identified during survey H-10383 as contact number 61.21. It was determined to be significant during the preprocessing review of the survey. On DOY 122 and 126 an echosounder development found a least depth of 15.5 meters in surrounding depths of 16.3 meters.

N: 14990.3 E: 20247.9
LAT 30°08'06.829" LON 088°03'50.738"

Recommendation: This item is insignificant and should not be charted. Do not Concur. Chart as 15° Obst as shown on the present survey. Should the scale of the chart allow.

9002
This target was identified during survey H-10383 as contact number 1390.25. It was determined to be significant during the preprocessing review of the survey. On DOY 132 an echosounder development found a least depth of 13.36 meters in surrounding depths of 14.23 meters.

N: 15562.9 E: 18654.7
LAT 30°08'25.417" LON 088°03'50.266"

Recommendation: This item is insignificant and should not be charted. The least depth position is approximately 100 meters from a lighted gas well. Do not Concur. Chart as 15° Obst as shown on the present survey.

9003
This target was identified and determined to be significant during the preprocessing review of survey H-10393. On DOY 132 an echosounder development found a least depth of 12.34 meters in surrounding depths of 12.9 meters.

13.0
N. COMPARISON WITH THE CHART

See descriptive report for project H-10393.

O. ADEQUACY OF SURVEY

This survey meets or exceeds 1:10,000 specifications, and is adequate to supersede all prior surveys for the purpose of charting the depths and hazards to navigation within the survey area.

This additional work (to reinvestigate targets identified during the preprocessing review of H-10393) required three additional days of ship time and resulted in no change to HECK's original determination of insignificance for all targets. Two of these contacts are insignificant due to proximity to much more hazardous features. This additional data supports the adequacy of the original survey.

P. AIDS TO NAVIGATION

See also section 2.6 of the Evaluation Report

See descriptive report for H-10393.

Q. STATISTICS

<table>
<thead>
<tr>
<th>ITEM</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Total Number of Positions</td>
<td>124 Fixes</td>
</tr>
<tr>
<td>2. Lineal NM of Soundings</td>
<td>N/A</td>
</tr>
<tr>
<td>3. Square NM Hydrography</td>
<td>N/A</td>
</tr>
<tr>
<td>4. Days of Production</td>
<td>3 Days</td>
</tr>
<tr>
<td>5. Bottom Samples</td>
<td>None</td>
</tr>
<tr>
<td>6. Tide Stations Established</td>
<td>None</td>
</tr>
<tr>
<td>7. Current Stations Established</td>
<td>None</td>
</tr>
<tr>
<td>8. Velocity Casts Performed</td>
<td>1 Casts</td>
</tr>
<tr>
<td>9. Magnetic Stations Established</td>
<td>None</td>
</tr>
<tr>
<td>10. Detached Positions</td>
<td>None</td>
</tr>
</tbody>
</table>
R. MISCELLANEOUS

No anomalies in tide, current or magnetics were noted.

S. RECOMMENDATIONS

Recommendations concerning specific additional work items and depths are located in section M of this report. No additional investigations or field work are recommended.

T. REFERRAL TO REPORTS

Electronic control report included with H-10418.

This report should be evaluated together with the Descriptive Report for sheet H-10393.

Respectfully Submitted,

James E. Martin, ENS, NOAA
Field Operations Officer
NOAA Ship HECK
CONTROL STATIONS as of 26 Sep 1991

<table>
<thead>
<tr>
<th>No.</th>
<th>Type</th>
<th>Latitude</th>
<th>Longitude</th>
<th>H Cart</th>
<th>Freq</th>
<th>Vel Code MM/DD/YY</th>
<th>Station Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>F</td>
<td>000:14:22.002</td>
<td>000:14:51.512</td>
<td>11</td>
<td>250</td>
<td>0.0</td>
<td>1 08/01/91 DAUPHIN ISLAND WEST BASE</td>
</tr>
<tr>
<td>102</td>
<td>F</td>
<td>000:15:00.500</td>
<td>000:08:22.626</td>
<td>7</td>
<td>250</td>
<td>0.0</td>
<td>2 08/01/91 PIRATE 1987</td>
</tr>
<tr>
<td>103</td>
<td>F</td>
<td>000:13:41.550</td>
<td>000:01:28.458</td>
<td>20</td>
<td>250</td>
<td>0.0</td>
<td>6 08/01/91 MOBILE POINT LIGHT 1987</td>
</tr>
<tr>
<td>104</td>
<td>F</td>
<td>000:13:40.424</td>
<td>007:57:49.846</td>
<td>11</td>
<td>250</td>
<td>0.0</td>
<td>5 08/25/91 STORMY 1996</td>
</tr>
</tbody>
</table>
**Diving Operations**

**Date:** 29 Aug 1991

**Location:** Gulf of Mexico

**Dive Master:** Lt. Moeller

**Tenders:**

---

**Dive Plan:** Hem invert/CD

**Depth:** 55.0' Pneumo Lead Line

**Equipment Used:** Open Circuit Scuba

**Conditions:**
- **Wind:** Dir SE Kts 10
- **Seas:** Dir SE Ft 1-2
- **Current:** Kts N 0.2 Kts

---

**Max Depth:** 60 ft
**Max Time:** 2.7 min
**Average Least Depth:** 55.0' ft
**Least Depth Time:** 18:31

**Pneumofathometer:**
- S/N 8607004N (Shallow) Gage
- S/N 8704986 (Deep) Gage

**Dive Visibility:** 430
**Air Temp:** 88
**Water Temp:** 83

---

**Divers Table:**

<table>
<thead>
<tr>
<th>Divers Name</th>
<th>Si</th>
<th>Group</th>
<th>Rnt</th>
<th>Tk Pressure</th>
<th>Pres. Change</th>
<th>Dive Times</th>
<th>Bottom Time</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2900/800</td>
<td></td>
<td></td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>10</td>
<td></td>
<td></td>
<td>3000/500</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Post Dive Comments:**
- Layer of suspended sediment rises rose 1 meter above bottom thru-out area. 40 M circle search revealed several metal pipes ~ 2" dia, 10-20 ft long, calcined material. No Hanus noted rising more than 1 ft off bottom.

---

**Dive Master Signature**
Commander, Eighth Coast Guard District  
Aids to Navigation Branch  
Hale Boggs Federal Building, Room 1209  
501 Magazine Street  
New Orleans, LA 70130-3396

Dear Sir,

During operations by the NOAA Ship HECK on survey project OPR-J461-HE, He-10-2-91, H-10393, Approaches to Mobile Bay significant shoaling was discovered in the Dump Site located west of the channel. The specific information is as follows:

<table>
<thead>
<tr>
<th>Sounding@MLLW</th>
<th>Position (NAD 83)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 foot (5.5m)</td>
<td>30°09'30.0&quot;N</td>
</tr>
<tr>
<td></td>
<td>088°06'21.0&quot;W</td>
</tr>
<tr>
<td>19 foot (5.9m)</td>
<td>30°09'37.0&quot;N</td>
</tr>
<tr>
<td></td>
<td>088°06'43.0&quot;W</td>
</tr>
<tr>
<td>20 foot (6.3m)</td>
<td>30°09'48.0&quot;N</td>
</tr>
<tr>
<td></td>
<td>088°07'07.0&quot;W</td>
</tr>
</tbody>
</table>

These soundings have been corrected for predicted tides.

A chartlet is attached for your information. These soundings affect NOS chart 11376. For additional information please contact me at (904) 572-5052.

Sincerely,

John W. Blackwell, LCDR, NOAA  
Commanding Officer  
NOAA Ship HECK
VII. LETTER OF APPROVAL

Field operations contributing to the accomplishment of this survey were conducted under my direct supervision with frequent personal checks of progress and data quality. This report, field sheets, and data records have been closely reviewed and are complete and adequate for charting.

John W. Blackwell, LCDR, NOAA
Commanding Officer
NOAA Ship HECK
VII. LETTER OF APPROVAL

Field operations contributing to the accomplishment of this survey were conducted under my direct supervision with frequent personal checks of progress and data quality. This report, field sheets, and data records have been closely reviewed and are complete and adequate for charting.

[Signature]

John W. Blackwell, LCDR, NOAA
Commanding Officer
NOAA Ship HECK
DATE: October 25, 1991

MARINE CENTER: Atlantic

OPR: J461

HYDROGRAPHIC SHEET: H-10393

LOCALITY: Entrance to Main Ship Channel, Gulf of Mexico, AL

TIME PERIOD: August 13 - September 10, 1991

TIDE STATIONS USED: 873 5180 Dauphin Island, AL
Lat. 30° 15.0'N  Lon. 86° 04.5'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 2.68 feet

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.2 feet

REMARKS: RECOMMENDED ZONING
Apply a -01 hr 40 min correction to all times, and a X1.23 range ratio to all heights.

NOTE: Hourly heights are tabulated on Central Standard Time.

CHIEF, DATUMS SECTION
<table>
<thead>
<tr>
<th>Name on Survey</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALABAMA (title)</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>GULF OF MEXICO</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>MAIN SHIP CHANNEL</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

**Approved**

*Chief Geographer*

**AUG - 5 1992**
<table>
<thead>
<tr>
<th>Activity</th>
<th>Time-Hours</th>
<th>Date Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREPROCESSING EXAMINATION</td>
<td>108</td>
<td>11/26/91</td>
</tr>
<tr>
<td>VERIFICATION OF FIELD DATA</td>
<td>181</td>
<td>04/20/92</td>
</tr>
<tr>
<td>ELECTRONIC DATA PROCESSING</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>QUALITY CONTROL CHECKS</td>
<td>104</td>
<td></td>
</tr>
<tr>
<td>EVALUATION AND ANALYSIS</td>
<td>77</td>
<td>08/21/92</td>
</tr>
<tr>
<td>FINAL INSPECTION</td>
<td>33</td>
<td>03/30/93</td>
</tr>
<tr>
<td>TOTAL TIME</td>
<td>581</td>
<td></td>
</tr>
</tbody>
</table>

ATLANTIC HYDROGRAPHIC SECTION APPROVAL 03/31/92
**LETTER TRANSMITTING DATA**

**TO:**

Chief, Data Control Section, N/C243
NOAA/National Ocean Service
Room 151, WSC-1
Rockville, MD 20852

**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-10393 and Additional Work**
Alabama, Gulf of Mexico, Entrance to Main Ship Channel

<table>
<thead>
<tr>
<th>1 Tube containing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Original Descriptive Report for H-10393 and 10393 Ad. Wk.</td>
</tr>
<tr>
<td>1 Original Smooth Sheet for H-10393</td>
</tr>
<tr>
<td>1 Original Position Overlay</td>
</tr>
<tr>
<td>3 Original Excess sounding Overlays</td>
</tr>
<tr>
<td>8 Smooth Field Sheets for H-10393</td>
</tr>
<tr>
<td>3 Smooth Field Sheets for H-10393 Ad. Wk.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1 Box containing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Folder containing Tides</td>
</tr>
<tr>
<td>1 Folder containing Original Descriptive Report Separates</td>
</tr>
<tr>
<td>1 Envelope containing Appendices removed from the original Descriptive Report</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1 Box containing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Cahier with final sounding printout and Line File Listing</td>
</tr>
<tr>
<td>1 Cahier with final position printout and control file listing</td>
</tr>
<tr>
<td>1 Envelope with sonargrams for day 132</td>
</tr>
<tr>
<td>1 Envelope with position overlays for H-10393 Ad. Wk.</td>
</tr>
<tr>
<td>1 Accordian file with fathograms &amp; field printouts for 1992 JDs 122, 126 and 132</td>
</tr>
</tbody>
</table>

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

**RECEIVED THE ABOVE**
(Name, Division, Date)
D.S. Clark
4/14/93

Return receipted copy to:

Atlantic Hydrographic Section, N/C243
439 W. York Street
Norfolk, VA 23510-1114
COAST AND GEODETIC SURVEY
ATLANTIC HYDROGRAPHIC SECTION
EVALUATION REPORT

SURVEY NO.: H-10393 and
Additional Work

FIELD NO.: HE-10-2-91

Alabama, Gulf of Mexico, Entrance to Main Ship Channel

SURVEYED: 13 August to 10 September 1991 and 1 May to 11 May 1992

SCALE: 1:10,000

PROJECT NO.: OPR-J461-HE

SOUNDINGS: RAYTHEON DSF-6000N Fathometer, EG&G Model 260 Side
Scan Sonar

CONTROL: MOTOROLA Falcon 484 Mini-Ranger (Range/Range)

Chief of Party.....................J. W. Blackwell

Surveyed by.......................D. W. Moeller

..................................K. N. Harbison

..................................J. E. Martin

..................................W. R. Morris

Automated Plot by..................XYNETICS 1201 Plotter (AHS)

1. INTRODUCTION

a. This is a combined basic hydrographic/side scan sonar
survey. Side scan sonar was operated simultaneously with the
fathometer during survey operations.

b. This survey was conducted during two field seasons, 1991
and 1992. The 1992 season was additional work to further develop
side scan sonar items found during office processing on the
present survey. The two Descriptive Reports have been combined
under a single cover. See also section 7.a.1) of this report.

c. No unusual problems were encountered during office
processing.

d. Notes in the Descriptive Report were made in red during
office processing.

2. CONTROL AND SHORELINE

a. Control is adequately discussed in sections H., I., and
T. of the Descriptive Report.

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

To place the smooth sheet on the NAD 27 move the projection lines 0.739 seconds (22.76 meters or 2.28 mm at the scale of the survey) north in latitude, and 0.007 seconds (0.19 meters or 0.02 mm at the scale of the survey) east in longitude.

b. There is no shoreline within the area surveyed.

3. HYDROGRAPHY

a. Soundings at crossings are in excellent agreement and comply with the criteria found in sections 4.6.1 and 6.3.4.3. of the HYDROGRAPHIC MANUAL.

b. The standard depth curves are drawn in their entirety. Additionally, some brown and dashed curves were also drawn to delineate bottom relief.

c. The development of the bottom configuration and determination of least depths is considered adequate.

4. CONDITION OF SURVEY

The smooth sheet and accompanying overlays, hydrographic records and reports are adequate and conform to the requirements of the HYDROGRAPHIC MANUAL with the following exceptions:

a. There are four (4) U. S. Coast Guard floating aids to navigation, three privately maintained mooring buoys, two lighted gas wells, and a lighted oil platform in the survey area. The field unit did not acquire positional data, other than a computed side scan sonar position, on any of these features. It is imperative that the field unit provide the most accurate position possible for features located in the survey area.

b. The sonargrams submitted by the field unit lacked the required annotations at the beginning of each day, the beginning and end of each line, and some of the special annotations described in section 2.6, pages 2-15 through 2-17, of the SIDE SCAN SONAR MANUAL.

c. The required 200% side scan sonar coverage was not achieved throughout the entire survey area. Steering errors, line spacing, and positional errors are all considered contributing factors to the failure to accomplish the required 200% coverage.
d. The Danger to Navigation Report submitted by the field unit to the Eighth Coast Guard District is not the required format described in Hydrographic Survey Guideline (HSG) 66, dated 30 September 1988. A copy of the report is appended to the Descriptive Report.

5. JUNCTIONS

H-10394 (1991) to the south
H-10403 (1991) to the west
H-10418 (1992) to the east

Adequate junctions were effected between the present survey and the surveys listed above. Present survey depths are in harmony with the charted depths to the north.

6. COMPARISON WITH PRIOR SURVEYS

a. Hydrographic

H-10226 (1986-88) 1:20,000

The prior survey listed above covers the present survey area in its entirety.

Present survey depths are generally 0' to 0'5 meters (0.3 to 1.6 feet) shoaler than prior survey depths. The following should be noted:

1) A radical change between prior survey depths and present survey depths exists along a line running from Latitude 30°09'15"N, Longitude 88°05'45"W to Latitude 30°10'00"N, Longitude 88°07'15"W. This area is inside the charted Dump Site. Present survey depths range from 2 to 5 meters (6 to 16 feet) shoaler than prior survey depths. This difference is attributed to the dumping of dredged material. Three soundings that are located within the Dump Site were identified by the field unit for inclusion in a letter to the Eighth Coast Guard District, Office of Aids to Navigation (oan). These soundings are listed as follows:

<table>
<thead>
<tr>
<th>DEPTH (m/ft)</th>
<th>Latitude (N)</th>
<th>Longitude (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5'/18</td>
<td>30°09'30.36&quot;</td>
<td>88°06'21.13&quot;</td>
</tr>
<tr>
<td>5'/19</td>
<td>30°09'37.27&quot;</td>
<td>88°06'43.17&quot;</td>
</tr>
<tr>
<td>6'/20</td>
<td>30°09'48.70&quot;</td>
<td>88°07'07.19&quot;</td>
</tr>
</tbody>
</table>

It is recommended that these soundings be charted as shown on the present survey.
2) Seven (7) AWOIS items originate with the prior survey and are listed as follows:

<table>
<thead>
<tr>
<th>AWOIS Item #</th>
<th>Latitude (N)</th>
<th>Longitude (W)</th>
<th>Comment</th>
<th>Depth FT/M</th>
</tr>
</thead>
<tbody>
<tr>
<td>#7330</td>
<td>30°09'31.99&quot;</td>
<td>88°07'15.38&quot;</td>
<td>Charted</td>
<td>41/12&quot;</td>
</tr>
<tr>
<td>#7338</td>
<td>30°09'32.39&quot;</td>
<td>88°05'57.85&quot;</td>
<td>Charted</td>
<td>28/8&quot;</td>
</tr>
<tr>
<td>#7339</td>
<td>30°09'43.73&quot;</td>
<td>88°05'58.99&quot;</td>
<td>Not Charted</td>
<td>31/9&quot;</td>
</tr>
<tr>
<td>#7340</td>
<td>30°09'41.73&quot;</td>
<td>88°05'58.99&quot;</td>
<td>Charted</td>
<td>30/9&quot;</td>
</tr>
<tr>
<td>#7341</td>
<td>30°09'34.73&quot;</td>
<td>88°05'53.99&quot;</td>
<td>Not Charted</td>
<td>33/10&quot;</td>
</tr>
<tr>
<td>#7342</td>
<td>30°09'33.73&quot;</td>
<td>88°05'57.99&quot;</td>
<td>Not Charted</td>
<td>34/10&quot;</td>
</tr>
<tr>
<td>#7443</td>
<td>30°09'18.73&quot;</td>
<td>88°05'53.99&quot;</td>
<td>Charted</td>
<td>33/10&quot;</td>
</tr>
</tbody>
</table>

All of these items are shown as obstructions on the prior survey, and four of these items are presently charted as obstructions. These items were searched for by the field unit with negative results. These items are considered disapproved by the present survey. Additionally, these items are located within the limits of the charted Dump Site and are most likely dredged material that has been dumped. It is recommended that the charted items be removed from the chart and the area be charted as shown on the present survey.

The present survey is adequate to supersede the above prior survey within the common area.

b. Wire Drag

H-9374WD (1973) 1:40,000

Nine (9) hangs or groundings originating with the prior survey fall within the present survey area. Two additional hangs or groundings are located near the edges of the present survey. Four of the hangs or groundings that are within the limits of the present survey are charted AWOIS items. The following should be noted:

1) AWOIS Item #3641, a charted Shl with a wire drag clearance depth of 35 feet, in Latitude 30°08'30.73"N, Longitude 88°05'32.99"W, originates with H-9374WD (1973). The AWOIS history states that this item will be deleted from the chart. The AWOIS history also states that this item was disapproved by H-10226 (1986-88) with depths of 41 to 45 feet (12 to 13 meters). Present survey depths range from 12 to 13 meters (41 to 44 feet). The shoal is shown on the 4th edition of chart 11376. The present survey depths coupled with the absence of side scan sonar contacts in the vicinity reinforce the conclusion that the charted shoal does not exist. It is recommended that the feature be deleted from the chart and the area be charted as
shown on the present survey.

2) A copy of the A&D sheet for survey H-9374WD (1973) was not available for an effective depth comparison with present survey soundings.


a. **Hydrography**

The charted hydrography originates with the previously discussed prior surveys. The following should be noted:

1) The following four (4) uncharted obstructions with reported depths were noted during office processing of the present survey for the 1991 field season and recommended for additional work:

<table>
<thead>
<tr>
<th>Depth (m/ft)</th>
<th>Latitude (N)</th>
<th>Longitude (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14'/A/48(A)</td>
<td>30°08'04.76&quot;</td>
<td>88°03'53.06&quot;</td>
</tr>
<tr>
<td>14'/A/47(A)</td>
<td>30°08'06.67&quot;</td>
<td>88°03'50.61&quot;</td>
</tr>
<tr>
<td>12'/A/41(A)</td>
<td>30°08'25.29&quot;</td>
<td>88°04'50.33&quot;</td>
</tr>
<tr>
<td>11'/A/38(A)</td>
<td>30°09'53.80&quot;</td>
<td>88°07'31.28&quot;</td>
</tr>
</tbody>
</table>

The above items were developed and resolved by the hydrographer during the 1992 field season with the following results respectively:

<table>
<thead>
<tr>
<th>Depth (m/ft)</th>
<th>Latitude (N)</th>
<th>Longitude (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15'/49</td>
<td>30°08'05.32&quot;</td>
<td>88°03'53.63&quot;</td>
</tr>
<tr>
<td>15'/51</td>
<td>30°08'06.87&quot;</td>
<td>88°03'50.49&quot;</td>
</tr>
<tr>
<td>13'/44</td>
<td>30°08'25.42&quot;</td>
<td>88°04'50.27&quot;</td>
</tr>
<tr>
<td>12'/40</td>
<td>30°09'54.12&quot;</td>
<td>88°07'31.01&quot;</td>
</tr>
</tbody>
</table>

These obstructions are shown on the present survey and are considered adequate to supersede the above obstructions with reported depths. Charting recommendations are found in section M. of the report for additional work appended to the Descriptive Report.

2) During office processing five uncharted obstructions were noted in the field survey records and inserted into the present survey records. These obstructions are listed as follows:

<table>
<thead>
<tr>
<th>Depth (m/ft)</th>
<th>Latitude (N)</th>
<th>Longitude (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10'/35</td>
<td>30°10'12.56&quot;</td>
<td>88°06'35.19&quot;</td>
</tr>
<tr>
<td>14'/46</td>
<td>30°08'12.07&quot;</td>
<td>88°02'30.76&quot;</td>
</tr>
<tr>
<td>15'/49</td>
<td>30°08'11.91&quot;</td>
<td>88°02'37.38&quot;</td>
</tr>
</tbody>
</table>
Depth (m/ft) | Latitude (N) | Longitude (W)
---|---|---
14'1/46 | 30°08'10.32" | 88°02'37.35"
17'3/57 | 30°08'03.55" | 88°02'30.84"

It is recommended that these obstructions be charted as shown on the present survey. It is also recommended that additional work be conducted on these obstructions at an opportune time.

3) Two charted gas wells and a charted oil platform were located by the field unit in following locations:

<table>
<thead>
<tr>
<th>Description</th>
<th>Latitude (N)</th>
<th>Longitude (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas Well &quot;TI-MO-869-1&quot;</td>
<td>30°08'22.51&quot;</td>
<td>88°04'43.71&quot;</td>
</tr>
<tr>
<td>Gas Well &quot;EXXON-MO-868-1&quot;</td>
<td>30°09'01.06&quot;</td>
<td>88°06'14.34&quot;</td>
</tr>
<tr>
<td>Oil Platform &quot;SH-MO-132-JB&quot;</td>
<td>30°09'38.72&quot;</td>
<td>88°04'50.10&quot;</td>
</tr>
</tbody>
</table>

These positions compare favorably with the charted positions and the positions listed in the Eighth Coast Guard District's 1991 LISTING OF OFFSHORE OIL, GAS, AND MINERAL RELATED STRUCTURES. It is recommended that the structures be charted as shown on the present survey.

4) AWOIS Item #3627, a charted note Outer limit obstructions Fish Haven, in Latitude 30°06'40"N, Longitude 88°08'04"W, originates with Chart Letter 921 of 1959 (CL921/59) and was revised by CL577/61 and CL638/62. No indication of the fish haven was noted on H-10226 (1986-88). Field unit personnel discussed the item with local residents and determined that the fish haven was never established. The charted notation should be deleted from the chart.

5) A small piece of what appears to be centerline of the "Main Ship Channel" is charted in the vicinity of Latitude 30°08'35.78"N, Longitude 88°03'39.17"W. This line, which is oriented in a southwest to northeast direction, seems to serve no useful purpose. It is recommended that the chart compiler research the origin of this line and determine its appropriateness on future chart editions. The present survey is adequate to supersede the charted hydrography in the common area.

[Handwritten note: The present survey is adequate to supersede the charted hydrography in the common area.

Dept. NC-223 (Quality Assurance) notified by NC-241. 6/18/93, 5:50]
b. Controlling Depths

Three soundings near the edge of the Entrance Channel are shoaler than the 47 foot (14\text{3} meter) depth shown in the tabulation. These depths are as follows:

<table>
<thead>
<tr>
<th>Depth (m/ft)</th>
<th>Latitude (N)</th>
<th>Longitude (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14\text{2}/46</td>
<td>30°08'49.91&quot;</td>
<td>88°03'37.76&quot;</td>
</tr>
<tr>
<td>14\text{1}/46</td>
<td>30°08'51.66&quot;</td>
<td>88°03'27.99&quot;</td>
</tr>
<tr>
<td>14\text{1}/46</td>
<td>30°08'57.62&quot;</td>
<td>88°03'34.22&quot;</td>
</tr>
</tbody>
</table>

8. COMPLIANCE WITH INSTRUCTIONS

This survey complies with the Project Instructions except as noted in section 4. of this report.

9. ADDITIONAL FIELD WORK

This is an adequate basic survey; additional field work recommendations are in section 7.a.2) of this report.

Franklin L. Saunders
Cartographic Technician
Verification of Field Data

Robert G. Roberson
Supervisory Cartographer
Evaluation and Analysis

Leroy G. Cram
Supervisory Cartographic Technician
Verification Check
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 magnetic tape record for this survey. Final control, position, and sounding printouts of the survey have been made. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Richard H. Whitfield
Cartographer, Evaluation and Analysis Team
Atlantic Hydrographic Section
Date: 31 March 1993

Christopher B. Lawrence, CDR, NOAA
Chief, Atlantic Hydrographic Section
Date: 31 March 1993

Final Approval:

Approved:  J. Austin Yeager
Rear Admiral, NOAA
Director, Coast and Geodetic Survey
Date: 3-13-95
### 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.

<table>
<thead>
<tr>
<th>CHART</th>
<th>DATE</th>
<th>CARTOGRAPHER</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>11006</td>
<td>7/17/93</td>
<td>John Banks</td>
<td>Full Part Before After Marine Center Approval Signed Via</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Drawing No. 78 Exam. no corr.'s due to scale</td>
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<tr>
<td>411</td>
<td>7/17/93</td>
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<td></td>
<td></td>
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<td>11376</td>
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<td>Drawing No. 55 APP'd critical corr.'s</td>
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<td>7/26/93</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Drawing No. 38 APP'd critical corr.'s</td>
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<td>11377</td>
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<td>Full Part Before After Marine Center Approval Signed Via</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Drawing No. 2 APP'd critical corr.'s</td>
</tr>
<tr>
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<td>7/26/93</td>
<td>John Banks</td>
<td>Full Part Before After Marine Center Approval Signed Via</td>
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<td></td>
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<td>Drawing No. 65 APP'd critical corr.'s</td>
</tr>
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<td>11360</td>
<td>7/26/93</td>
<td>John Banks</td>
<td>Full Part Before After Marine Center Approval Signed Via</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Drawing No. 47 APP'd critical corr.'s</td>
</tr>
<tr>
<td>11360</td>
<td>5/10/94</td>
<td>Doug Hoffs</td>
<td>Full Part Before After Marine Center Approval Signed Via</td>
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<td></td>
<td>Drawing No. 48</td>
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<td>11006</td>
<td>9/15/95</td>
<td>Jerry Shade</td>
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<td>Drawing No.</td>
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