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Diagram No. 1115-3

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. ... HE-10-2-92

Registry No. ... H-10423

LOCALITY

State ... Alabama

General Locality ... Gulf of Mexico

Sublocality ... Southeast Approach to

Mobile Bay

19 92

CHIEF OF PARTY

LCDR J.W. Blackwell

LIBRARY & ARCHIVES

DATE ... January 10, 1994

HYDROGRAPHIC TITLE SHEET

H-10423

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 NO.

HE-10-2-92

State Alabama

General locality Gulf of Mexico

Locality Southeast Approach to Mobile Bay

Scale 1:10,000

Date of survey 13 April - 11 May 1992

Instructions dated 18 February 1992

Project No. OPR-J461-HE

Vessel NOAA SHIP HECK (EDP 9140)

Chief of party John W. Blackwell, LCDR, NOAA

Surveyed by LCDR J.W. Blackwell, LT M.S. Abbott, LTJG K.N. Harbison, ENS J.E. Martin, ST W.R. Morris

Soundings taken by echo sounder, ~~and lead line~~

aphic record scaled by LT M.S. Abbott, LTJG K.N. Harbison, ENS J.E. Martin, ST W.R. Morris

Graphic record checked by LTJG K.N. Harbison

Protracted by N/A

SYNETICS 1201 PLOTTER (FIELD)
Automated plot by HDAPS (FIELD)

Verification by Atlantic Hydrographic Section, N/CG244 PERSONNEL
Meters

Soundings in ~~fathoms~~ feet at ~~MLLW~~ MLLW

REMARKS: Change #1 dated 02 April 1992

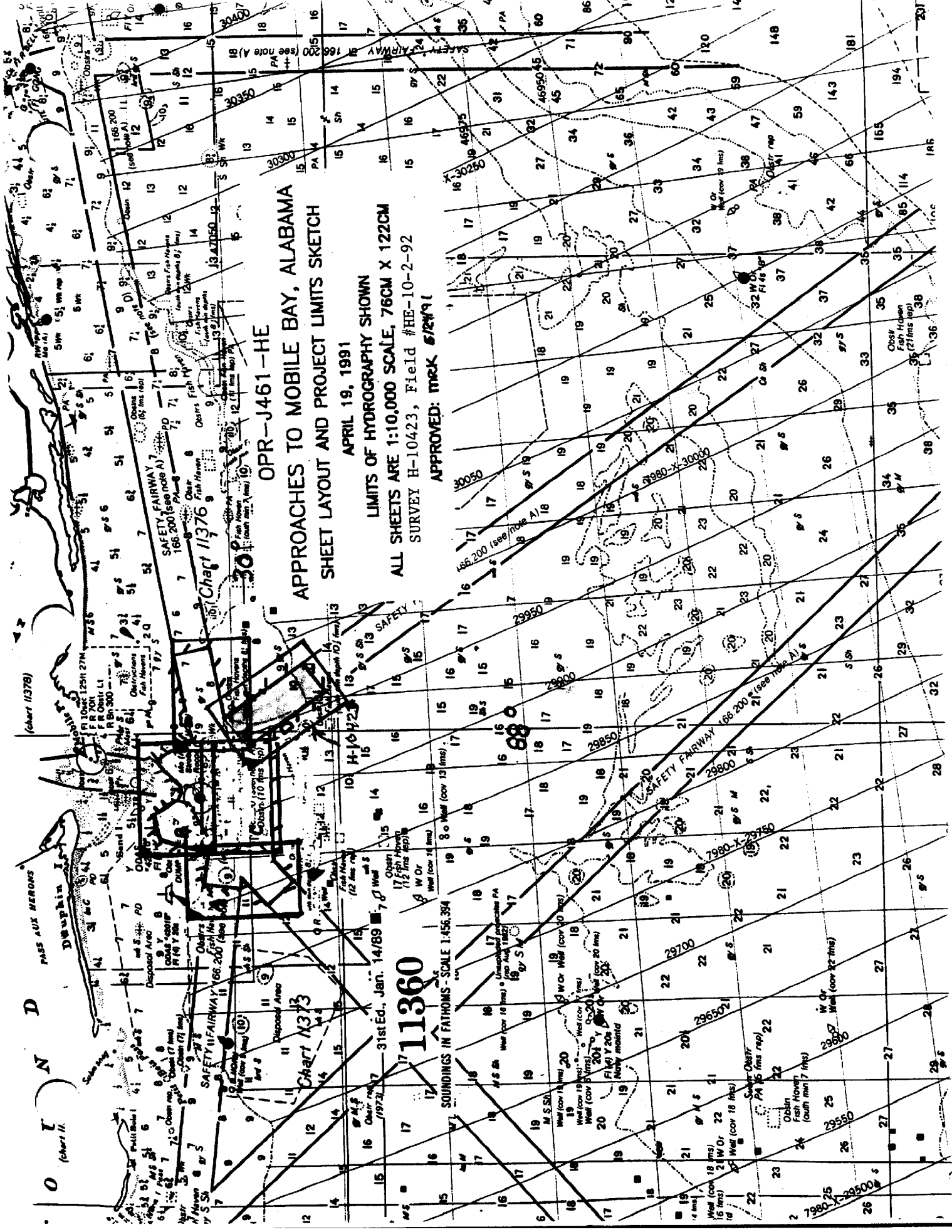
All times UTC

Data submitted to Atlantic Hydrographic Section, N/CG244

NOTES IN THE DESCRIPTIVE REPORT WERE MADE
IN RED DURING OFFICE PROCESSING

ACQUIS/SURF ✓, 1/24/94, SJV

JWW 2/2/94



OPR-J461-HE
APPROACHES TO MOBILE BAY, ALABAMA
SHEET LAYOUT AND PROJECT LIMITS SKETCH

APRIL 19, 1991

LIMITS OF HYDROGRAPHY SHOWN

ALL SHEETS ARE 1:10,000 SCALE, 76CM X 122CM

SURVEY H-10423, Field #HE-10-2-92

APPROVED: MKK 6/21/91

11360

SOUNDINGS IN FATHOMS - SCALE 1:456,384

31st Ed., JAN. 14/89

1973

Chart 11373

Chart 11376

Chart 11378

SAFETY FAIRWAY 166,200 (see note A)

SAFETY FAIRWAY 166,200 (see note A)

SAFETY FAIRWAY 166,200 (see note A)

SAFETY FAIRWAY 166,200 (see note A)

SAFETY FAIRWAY 166,200 (see note A)

SAFETY FAIRWAY 166,200 (see note A)

SAFETY FAIRWAY 166,200 (see note A)

SAFETY FAIRWAY 166,200 (see note A)

SAFETY FAIRWAY 166,200 (see note A)

SAFETY FAIRWAY 166,200 (see note A)

SAFETY FAIRWAY 166,200 (see note A)

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SAFETY FAIRWAY 166,200 (see note A)

SAFETY FAIRWAY 166,200 (see note A)

SAFETY FAIRWAY 166,200 (see note A)

O I N D

Chart 11378

Chart 11376

Chart 11373

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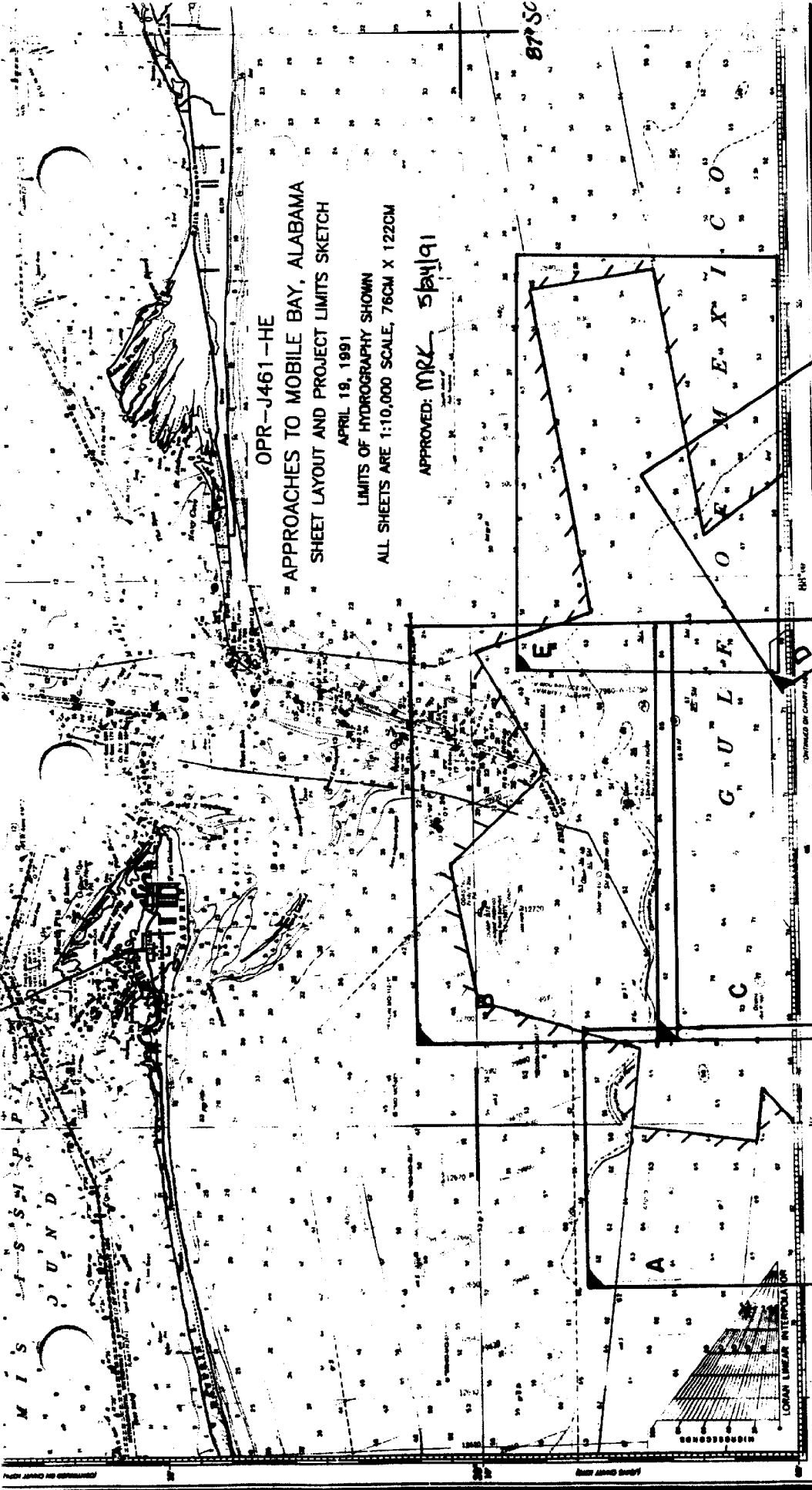
Chart 11373

Chart 11376

Chart 11373

Chart 11376

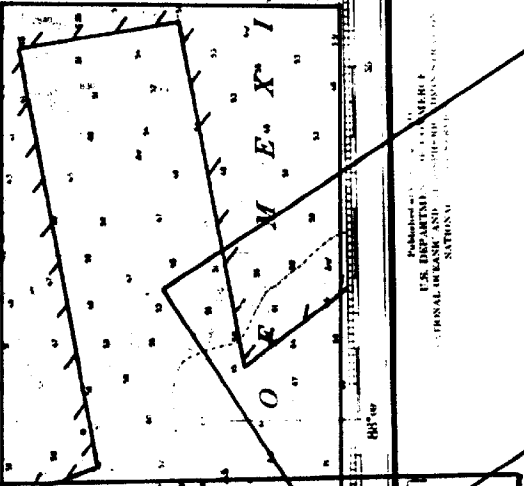
Chart 11373



OPR-J461-HE
 APPROACHES TO MOBILE BAY, ALABAMA
 SHEET LAYOUT AND PROJECT LIMITS SKETCH
 APRIL 19, 1991
 LIMITS OF HYDROGRAPHY SHOWN
 ALL SHEETS ARE 1:10,000 SCALE, 76CM X 122CM

APPROVED: *MRK* 5/24/91

877 SC



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 U.S. DEPARTMENT OF COMMERCE
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
 NATIONAL CENTER FOR HYDROGRAPHY

IN FEET

11376
 LORAN-C OVERPLOT SHEET

H-10423

DESCRIPTIVE REPORT TO ACCOMPANY
SURVEY H-10423
FIELD NUMBER HE-10-2-92
ALABAMA
GULF OF MEXICO
SOUTHEAST APPROACH TO MOBILE BAY
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 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 to be conducted on H-10393.

B. AREA SURVEYED

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

- | | |
|----------------------------------|-------------------------------|
| 1. LAT 30°01' ²⁷ 30"N | LON 087°55' ³ 28"W |
| 2. LAT 30°06'15"N | LON 087°59'12"W 04" |
| 3. LAT 30°05'18"N | LON 088°01'12"W 19" |
| 4. LAT 30°03'35"N | LON 088°01'12"W 17" |
| 5. LAT 30°03'39"N | LON 088°00'03"W 01'04" |
| 6. LAT 30°00' ²² 30"N | LON 087°57'48"W 44" |

Survey operations began on April 13, 1992 (DOY 104), and were completed on May 11, 1992 (DOY 132).

All data was gathered and processed using 1:10,000 specifications and submitted on 1:10,000 smooth plots.

C. SURVEY VESSELS

All hydrographic and side scan data were collected by 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 HDAPS hardware and the latest version of the NAVITRONIC NAVISOFT 300 software provided to the ship by N/CG24. Sound velocity correctors were calculated using VELOCITY version 1.11 dated 3/9/90. A listing of actual programs and versions is appended in Appendix VI.

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:

Towfish	S/N 011901	DOY 104 - 132
Recorder	S/N 012106	DOY 104 - 132

The beam width and down angle are not adjustable on this unit. All SSS data was collected using the 50 and 100 meter range scales and 100 Khz frequency. Line spacing of 170 meters was used on the 100 meter scale to maintain the required 2mm of adjacent line overlap. The side scan 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.

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.

In general, the side scan sonar trace appears very good, however two specific anomalies were observed. The first is noted between positions 180 - 188. In this instance the side scan towfish lost "contact" with the bottom more frequently than is normal. This is due to a combination of sea state, propeller noise and cable length. The trace through these eight fixes was determined to still be acceptable. The second anomaly is noted throughout a large portion of this survey. A bottom type which is highly reflective and produced a mottled (dark patches) side scan trace is observed in the following geographic area: South of 30°02'00" within the entire East to West sheet limits. The dark patches are intermittent but appear frequently within this area.

The sonar contact list (Side Scan Sonar Manual 3.1.1.1.) is provided through the HECK's side scan survey contact abstract table and the automated HDAPS contact printout that is produced during the computation and logging of contacts. Depths on HDAPS contact printout are raw, however, depths on the side scan survey contact list are manually corrected for draft (+2.1 meters). Both are located in the separates.

Ten 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 target number from 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.

Targets which were initially determined to warrant further investigation were developed with side scan sonar on the 50 meter scale. If the result of the 50 meter side scan pass indicated a significant target a diver least depth was obtained. One significant target was developed using side scan sonar (target #938.24). This contact was developed by defining the outer limits and the center (least depth) of the item with side scan sonar on the 50 meter scale.

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

F. SOUNDING EQUIPMENT

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

S/N A107N DOY 104 - 132

Echosounder A107N experienced no significant down time or operations in the manual mode during this survey.

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

A leadline was used to measure all diver least depths. Good diving visibility (>60 ft) allowed scope to be eliminated. The comparison sheet is appended.

Annotations for sea state and weather appear at least once a day on the daily printout. Weather observation sheets for each day of hydrography are also 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

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

VELOCITY TABLE	DATE	LOCATION
2	08/04/92 (DOY 099)	30°05'06"N 088°01'12"W
3	14/04/92 (DOY 105)	30°01'06"N 087°55'18"W
4	29/04/92 (DOY 120)	30°00'30"N 087°57'18"W

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 perform 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. A mean difference of 0.06 meter was obtained resulting in 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.

New requirements for settlement and squat correctors were agreed upon during the 1992 Hydrographic Field Procedures conference in Norfolk, VA. These requirements allow hydrographic units to conduct settlement and squat calibrations once every two years, or after major modifications to the ship. 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. These correctors are on file at N/CG244 and are included in separates section IV.

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

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 the situations where correctors were not automatically applied due to HIPPY malfunction (lock-up) selected depths were scanned and corrected to remove 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. The station was maintained under contract by Chapin and Associates, 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 WERE APPLIED DURING OFFICE PROCESSING.*

H. CONTROL STATIONS *SEE SECTION 2.2. 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:

<u>Number</u>	<u>Station</u>
103	- MOBILE POINT LIGHT
104	- STORMY
105	- ELANA
106	- DAUPHIN ISLAND USAF E DOME

Positions for MOBILE POINT LIGHT, ELANA, STORMY, and DAUPHIN ISLAND USAF E DOME were obtained from N/CG23322 Coastal Surveys Unit. No horizontal control work was necessary by ship's personnel for these stations. The positions supplied by N/CG23322 were deemed sufficient for this survey.

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 2.2. 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). *FILED WITH ORIGINAL FIELD RECORDS.*

Equipment serial numbers appear as part of the header information on each day's data print out. The Mini-Ranger remote units are identified by their position and code numbers. This abstract can be used to verify the application of correctors.

The daily listing of position control equipment can be found on the daily data abstracts in section III of the Separates and the header information found on the HDAPS data sheet printouts. The following is a summary of the changes made to hydrographic positioning equipment during this survey:

-On DOY 112 the original RPU/RT pair (sn E0160/sn E2968) were replaced. The new pair were sn D0018 and sn E2932.

-On DOY 114 RT E2932 was replaced with RT E2968.

-On DOY 120 the remote on station 105 was damaged by weather and replaced. A new remote was put up and the code was changed from code 4 to code 6.

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.

The Motorola Mini-Ranger system is starting to show its age. Baseline calibrations revealed very weak remotes, and several useless receiver/transmitters. The MASS setting for some combinations made long range work all but impossible. Although no ship time was lost due to failures, a large amount of money was spent shipping these units to and from the Marine Center.

J. SHORELINE *SEE ALSO SECTION 2.6. OF THE EVALUATION REPORT*

Not applicable as per project instructions.

K. CROSSLINES *SEE ALSO SECTION 3. OF THE EVALUATION REPORT.*

17.2 miles of crosslines were run on this survey, representing 6.6% of all hydrography. Comparison to mainscheme soundings showed good agreement with random differences of ± 0.1 meters.

L. JUNCTIONS *SEE SECTION 5. OF THE EVALUATION REPORT.*

<u>SURVEY</u>	<u>DATE</u>	<u>SCALE</u>	<u>LOCATION</u>
H-10394	1991	1:10000	Northeast Junction
H-10418	1992*	1:10000	Northern Junction

Comparisons showed excellent agreement with all randomly selected soundings. All soundings compared to within $0.2_{1/2}$ meters.

*H-10418 was submitted on 29 May 1992 to AHS and is not yet a fully processed survey. Preliminary data was used for comparison. *PROCESSED AT TIME OF OFFICE VERIFICATION*

M. COMPARISON WITH PRIOR SURVEYS *SEE SECTION 6. OF THE EVALUATION REPORT.*

Comparisons were made to the following prior surveys:

<u>SURVEY</u>	<u>DATE</u>	<u>SCALE</u>
H-10206	1985	1:40,000
H-9374WD	1973	1:40,000
H-10179	1985	1:20,000

Comparison with MT. MITCHELL's 1985 survey (H-10206) showed exact agreement with all randomly chosen soundings.

Comparison with H-9374WD showed excellent agreement with all point contacts except one. H-9374WD indicated a cleared depth of 61 feet at Latitude 30°04'42", Longitude 087°58'48". The current survey (H-10423) and H-10206 both indicate a depth of 56 feet at this location. *SEE ALSO SECTION 6. OF THE EVALUATION REPORT*

No AWOIS items were identified by prior surveys within this sheet's limits.

No major areas of bottom "shifting" have occurred within the sheet limits since prior surveys were conducted.

N. COMPARISON WITH THE CHART *SEE ALSO SECTION 7. OF THE EVALUATION REPORT.*

Comparison of surveyed soundings were made with current editions of the following NOS charts:

<u>CHART</u>	<u>EDITION</u>	<u>DATE</u>	<u>SCALE</u>
11376	42nd	Jan/92	1:80,000
11360	32nd	Mar/91.	1:456,394

The soundings agreed well with the charted soundings on 11376, comparing consistently within 1 foot. Chart 11360 contained only one sounding in the survey area (within the Safety Fairway) and agreed within 2 feet. Overall, agreement was excellent. *Correct*

No major bottom shifting was noted when compared to the current applicable charts.

HECK has noted, through discussions with the pilots and local fishermen, that the present chart layout for the approaches to Mobile Bay is inadequate. A 1:80,000 scale chart extending from about mid-bay to the southern extreme of this survey area would be of much greater use to shipping interests and fishermen.

No danger to navigation reports were submitted as a result of this survey.

One hundred fifty (150) contacts were identified during this survey. Eleven (11) targets warranted additional investigation based on either height off the bottom (≥ 1 meters in < 20 meters of water or $\geq 10\%$ of the depth in > 20 meters of water), appearance, or relation to an assigned AWOIS item. All such contacts were investigated with additional side scan coverage using the 50 meter range scale and/or divers. The following is a list of targets with associated investigation results and recommendations. Duplicate contacts from adjacent swaths or development work are cross referenced in the "Status/Same as" column of the Side Scan Sonar Abstract located in Separates Section V.

TARGET

NARRATIVE

53.35

Target 53.35 is identified on contact table 2 with a computed height off the bottom of 1.2 meters in 18.9 meters of water. Ship's divers investigated this item on DOY 127 and found a steel cylinder. A least depth of 18.4¹ meters was found using lead line. The cylinder was approximately 5 meters long and 2.2 meters high and had developed a 1'-2' scour around its perimeter. The target is located at the following position:

POSITION # 1638₁
LAT 30°06'07.50"N LON 087°59'19.9⁹W
E: 27497.1 N: 11318.6

Recommendation: This item is significant and should be charted as "Obstruction Least Depth 18.4¹ meters". *Concur (18¹ Obstr)*

56.34

Target 56.34 is identified on contact table 2 with a computed height off the bottom of 1.3 meters in 19.4 meters of water. Ship's divers investigated this item on DOY 126 and found a 1.1 meter diameter steel pipe 3.3 meters long and 1.0 meters off the bottom (partially buried). A least depth of 18.6³ meters was found using lead line. The target is located at the following position:

POSITION # 1639₂
LAT 30°05'28.80"N LON 087°58'55.30⁴W
E: 28157.9 N: 10127.8

Recommendation: This item is significant and should be charted as "Obstruction Least Depth 18.6³ meters". *Concur (18³ Obstr)*

140.79

Target 140.79 is identified on contact table 2 with a computed height off the bottom of 1.2 meters in 19.6 meters of water. This target was further investigated on DOY 126 between positions 1632-1633. This additional pass with the side scan sonar (50 meter range scale) showed the target to be insignificant. Further investigation was unnecessary.

Recommendation: This item is insignificant and should not be charted. *Concur.*

141.54

Target 141.54 is identified on contact table 2 with a computed height off the bottom of 2.3 meters in 19.7 meters of water. Ship's divers investigated this item on DOY 120 and found a 1.4 meter long steel pipe. A least depth of 18.9 meters was found using lead line. The pipe's height was 1.1 meter off the bottom. The target is located at the following position:

POSITION # 821

LAT 30°05'34.84"N LON 087°59'43.81"W

E: 26859.8 N: 10312.5

Loran W:12782.7 X:29955.7 Y:47047.6 Z:64078.9

Recommendation: This item is significant and should be charted as "Obstruction Least Depth 18.9 meters". *Concur (18' Obstr)*

391.71

Target 391.71 is identified on contact table 6 with a computed height off the bottom of 1.6 meters in 19.9 meters of water. This target was further investigated on DOY 120 by ship's divers. The divers found an old coil of mooring line with a height off the bottom of approximately one (1) foot. It is believed that on the original pass the proximity of the object to the towfish path resulted in an exaggerated computed height. Past experience and several instances on this survey show computed heights to be grossly exaggerated for targets passing close to the towfish.

Recommendation: Item is insignificant and should not be charted. *Concur.*

773.15

Target 773.15 is identified on contact table 8 with a computed height off the bottom of 2.1 meters in 15.7 meters of water. This target was further investigated on DOY 126 between positions 1614-1615 and 1616-1617. The additional passes with side scan sonar on the 50 meter scale and the DSF 6000N showed no indication of a significant target, further investigation was unnecessary. It is believed that on the original pass the proximity of the object to the towfish path resulted in an exaggerated computed height.

Recommendation: This item is insignificant and should not be charted. *Concur*

842.15

Target 842.15 is identified on contact table 8 with a computed height off the bottom of 1.4 meters in 17.4 meters of water. This target was further investigated on DOY 126 between positions 1593-1594 and 1595-1596. The additional passes with side scan sonar on the 50 meter scale and the DSF 6000N showed no indication of a significant target, further investigation was unnecessary. It is believed that on the original pass the proximity of the object to the towfish path resulted in an exaggerated computed height.

Recommendation: This item is insignificant and should not be charted. *Concur*

842.28

Target 842.28 is identified on contact table 8 with a computed height off the bottom of 3.9 meters in 17.9 meters of water. This target was further investigated on DOY 126 between positions 1593-1594. The additional pass with side scan sonar on the 50 meter scale and the DSF 6000N showed no indication of a significant target, further investigation was unnecessary. It is believed that on the original pass the proximity of the object to the towfish path resulted in an exaggerated computed height.

Recommendation: This item is insignificant and should not be charted. *Concur*

937.75

Target 937.75 is identified on contact table 9 with a computed height off the bottom of 2.1 meters in 17.4 meters of water. This target was further investigated on DOY 126 between positions 1599-1601. The additional pass with side scan sonar on the 50 meter scale and the DSF 6000N showed no indication of a significant target, further investigation was unnecessary. It is believed that on the original pass the proximity of the object to the towfish path resulted in an exaggerated computed height.

Recommendation: This item is insignificant and should not be charted. *CONCOR*

938.24

Target 938.24 is identified on contact table 9 with a computed height off the bottom of 1.0 meters in 17.6 meters of water. This target was further investigated on DOY 126 between positions 1597-1598, 1599-1601, 1602-1603 and 1604-1605. A DSF 6000N least depth of ~~16.4~~^{16.3} in 17.8⁷ meters of water was obtained at position 159~~7~~³.₃₀

POSITION # 1597.20 / 1599.3
LAT 30°02'38.20"N LON 087°57'21.42"W
E:30677.8 N:4876.5

Recommendation: This item is significant and should be charted as an "Obstruction, Least Depth ~~16.4~~^{15.6} meters." *CONCOR, 15' Obstr* ^{FATHOMETER}

1140.20

Target 1140.20 is identified on contact table 9 with a computed height off the bottom of 1.1 meters in 19.3 meters of water. This target was further investigated on DOY 126 between positions 1606-1607, 1608-1609 and 1610-1611. A DSF 6000N least depth of 19.2⁰ meters in 19.8⁴ meters of water was observed. No significant contact was observed with the side scan sonar on the 50 meter range scale. (*Pos. 1610.1*)

Recommendation: This item is insignificant and should not be charted. *CONCOR. SEE ALSO SECTION 7.2.1) OF THE EVALUATION REPORT.*

O. ADEQUACY OF SURVEY

This survey has met or exceeded 1:10,000 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. C. OF THE EVALUATION REPORT*

No floating aids to navigation were found in the area of this survey.

One well platform was located using the method of ships detached position (DP). The platforms identification number is SFIC-MO-914-A. *CONCUR SEE ALSO SECTION 7. Q. 2) OF THE EVALUATION REPORT.*

POSITION # 1649
LAT 30°04'42.00" LON 088°00'45.7L
E:25201.9 N:8656.5

Note: Due to an HDAPS Hyflex communication error which occurred immediately following the DP this DP was not saved to disk. ✓

Q. STATISTICS

ITEM	AMOUNT
1. Total Number of Positions	1648 Fixes
2. Lineal NM of Soundings	255.3 NM
3. Square NM Hydrography	21.0 NM ²
4. Days of Production	13 Days
5. Detached Positions	3
6. Bottom Samples	8
7. Tide Stations Established	None
8. Current Stations Established	None
9. Velocity Casts Performed	3 Casts
10. Magnetic Stations Established	None

R. MISCELLANEOUS

No anomalies in either tide or current were noted.

No magnetic anomalies were noted.

Eight bottom samples were taken and recorded on Log Sheet M. The log sheet was submitted to the Smithsonian Institution; a copy is included in section II of the Separates. The bottom samples were given to Dr. William W. Schroeder, Oceanographer, Dauphin Island Sea Lab. The area has been extensively sampled in the past. Minimal samples were required since those taken by HECK match those from prior surveys.

S. RECOMMENDATIONS *SEE ALSO SECTIONS 6 AND 7 OF THE EVALUATION REPORT.*

Recommendations concerning significant targets and least depths are located in sections M and N of this report. No additional investigations or field work are recommended. *CONCUR*

T. REFERRAL TO REPORTS

User Evaluation information is found in section M.

Coast Pilot Report is submitted with this Descriptive Report in Appendix VI.

Electronic Control Report - Reference Electronic Control Report submitted with Hydrographic Survey registry number H-10418.

Respectfully Submitted,



Michael S. Abbott, LT, NOAA
Executive Officer
NOAA Ship HECK

Reviewed and forwarded,



James E. Martin, ENS, NOAA
Operations Officer
NOAA Ship HECK

DIVING OPERATIONS
OFFICER: 81-91
GULF OF MEXICO
APPROACHES TO MOBILE BAY

INSIGNIFICANT TARGET

DN: 120

NOAA SHIP HECK S591

DATE: 29 APR 1992

POS # 16 Pos. 391.71

DIVE PLAN: CIRCLE SEARCH/ITEM INVESTIGATION
 SEARCH RADIUS: 40 meters

MAX DEPTH : 65 FT
 MAX TIME : 16 MIN
 LEAST DEPTH: - FT
 L/D TIME : - UTC

DEPTH FROM: PNEUMO/LEAD LINE

EQUIPMENT USED: OPEN CIRCUIT SCUBA

PNEUMOFATHOMETER:
 S/N 8607004N (SHALLOW) GAGE
 S/N 8704986 (DEEP) GAGE

CONDITIONS:

WIND : DIR SSE KTS 6
 SEAS : DIR - FT 1
 CURRENT : KTS -

VISIBILITY: 8
 AIR TEMP : 18.8
 WATER TEMP: 20.5

DIVERS NAME	SURF INT	GP	RNT	TNK PRESURE IN / OUT	PRES. CHANGE	DIVE TIMES DOWN/UP	BOTTOM TIME	DEPTH	GROUP
CO	:			<u>1</u>		<u>GMT</u>			
<u>XO</u>	:			<u>3000 / 1760</u>		<u>D 2003</u>	<u>#</u>	<u>16</u>	<u>65</u>
OPS	:			<u>1</u>					
<u>JO</u>	:			<u>2300 / 700</u>		<u>U 2029</u>	<u>16</u>	<u>65</u>	

DETACHED POSITION NUMBER: _____

LAT: _____ LON: _____

E: _____ N: _____

LORAN RATES W: _____ X: _____ Y: _____ Z: _____

DIVER COMMENTS:

Insignificant - coil of line ^(.3 meters) 1' off the bottom. Line was wire rope approximately 1/2" in diameter.

DIVING OPERATIONS
 OPP-~~10~~-91
 GULF OF MEXICO
 APPROACHES TO MOBILE BAY
 HE-10-2-92

DN: 1276

NOAA SHIP HECK S591

DATE: 5 MAY 1992

POS # 53.35

DIVE PLAN: CIRCLE SEARCH/ITEM INVESTIGATION
 SEARCH RADIUS: 40 meters

MAX DEPTH : 66 FT
 MAX TIME : 20 MIN
 LEAST DEPTH: 60.3 FT
 L/D TIME : _____ UTC

DEPTH FROM: PNEUMO/LEAD LINE

EQUIPMENT USED: OPEN CIRCUIT SCUBA

PNEUMOFATHOMETER:
 S/N 8607004N (SHALLOW) GAGE
 S/N 8704986 (DEEP) GAGE

CONDITIONS:

WIND : DIR SW KTS 5-10
 SEAS : DIR SW FT 1-2
 CURRENT : KTS .1

VISIBILITY: 40'
 AIR TEMP : 80°
 WATER TEMP: 78°

DIVERS NAME	SURF INT	GP	RNT	TNK PRESURE IN / OUT	PRES. CHANGE	DIVE TIMES DOWN/UP	BOTTOM TIME	DEPTH	GROUP
CO	:			<u>3100 / 1400</u>		D <u>1909</u>	<u>20</u>	<u>70</u>	<u>E</u>
JO	:			<u> / </u>					
OPS	:			<u>2800 / 900</u>		U <u>1928</u>	<u>20</u>	<u>70</u>	<u>E</u>
JO	:			<u> / </u>					

DETACHED POSITION NUMBER: 1638

LAT: 30° 06' 07.5" N LON: 087° 59' 19.98" W

E: 23497.1 N: 11318.6

LORAN RATES W: _____ X: _____ Y: _____ Z: _____

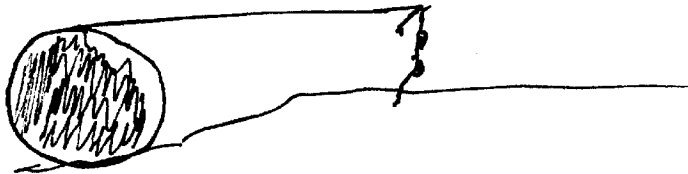
DIVER COMMENTS:

DIVERS FOUND A STEEL CYLINDER APPROXIMATELY 5m LONG AND 2.2m IN
DIAMETER. A LEAST DEPTH OF 18.4m WITH A HEIGHT OF THE BOTTOM OF
2.2 METERS WAS DETERMINED.

53.35

LEAST DEPTH
60.3'
18.4m

HS OPS
CUSTOM
2.2m



DIVING OPERATIONS
 OPR 0001-HE-91
 GULF OF MEXICO
 APPROACHES TO MOBILE BAY
 HE-10-2-92

DN: 127

NOAA SHIP HECK S591

DATE: 5 MAY 1992

POS # 56.39

DIVE PLAN: CIRCLE SEARCH/ITEM INVESTIGATION
 SEARCH RADIUS: 70 meters

MAX DEPTH : 68 FT
 MAX TIME : 20 MIN
 LEAST DEPTH: 61 FT
 L/D TIME : 20:59:00 UTC

DEPTH FROM: PNEUMO/LEAD LINE

EQUIPMENT USED: OPEN CIRCUIT SCUBA

PNEUMOFATHOMETER:
 S/N 8607004N (SHALLOW) GAGE
 S/N 8704986 (DEEP) GAGE

CONDITIONS:

WIND : DIR SW KTS 10
 SEAS : DIR SW FT 1-2
 CURRENT : KTS .24

VISIBILITY: 40'
 AIR TEMP : 80°F
 WATER TEMP: 72°F

DIVERS NAME	SURF INT	GP	RNT	TNK PRESURE IN / OUT	PRES. CHANGE	DIVE TIMES DOWN/UP	BOTTOM TIME	DEPTH	GROUP
CO	:	E		<u>3100 / 1250</u>		D <u>2050</u>	<u>20</u>	<u>70</u>	<u>4</u>
JO	:			<u> / </u>					
OPS	:	E		<u>2650 / 700</u>		U <u>2110</u>	<u>20</u>	<u>70</u>	<u>4</u>
JO	:			<u> / </u>					

DETACHED POSITION NUMBER: 1476

LAT: 30° 05' 28.8" N LON: 087° 58' 55.3" W
 E: 28157.9 N: 10122.4

LORAN RATES W: _____ X: _____ Y: _____ Z: _____

DIVER COMMENTS:

DIVERS FOUND A 3.3 m LONG STEEL PIPE WITH A 1.1 m DIAMETER
(18.6m)
DIVERS DETERMINED A LEAST DEPTH OF 61' AND A HEIGHT OFF THE BOTTOM
OF 1.0 m.

56.34

LEAST DEPTH

61'

18.6m

~~19.0m~~



DIVING OPERATIONS
 OPR-1481-HE-92
 GULF OF MEXICO
 APPROACHES TO MOBILE BAY
 HE-10-2-92

DN: 120

NOAA SHIP HECK S591

DATE: 29 APRIL 1992

POS # 141.54

DIVE PLAN: CIRCLE SEARCH/ITEM INVESTIGATION
 SEARCH RADIUS: 40 meters

MAX DEPTH : 68 FT
 MAX TIME : 24 MIN
 LEAST DEPTH: 62 FT
 L/D TIME : 1913 UTC

DEPTH FROM: PNEUMO/LEAD LINE

EQUIPMENT USED: OPEN CIRCUIT SCUBA

PNEUMOFATHOMETER:
 S/N 8607004N (SHALLOW) GAGE
 S/N 8704986 (DEEP) GAGE

CONDITIONS:

WIND : DIR SSE KTS 8
 SEAS : DIR - FT 3
 CURRENT : KTS 2.3

VISIBILITY: 30m
 AIR TEMP : 19.3°c
 WATER TEMP: 21.4°c

DIVERS NAME	SURF INT	GP	RNT	TNK PRESURE IN / OUT	PRES. CHANGE	DIVE TIMES DOWN/UP	BOTTOM TIME	DEPTH	GROUP
CO	:			<u>3200 / 1500</u>		D <u>1700</u>	<u>24</u>	<u>68</u>	
JO	:			<u>1</u>					
OPS	:			<u>2500 / 600</u>		U <u>1924</u>	<u>24</u>	<u>68</u>	
JO	:			<u>1</u>					

DETACHED POSITION NUMBER: 821

LAT: _____ LON: _____

E: 26859.8 N: 10312.5

LORAN RATES W: 12782.7 X: 29955.7 Y: 42043.6 Z: 64078.9

DIVER COMMENTS:

DIVERS FOUND A 1.9M LONG SECTION OF PIPE WITH A 1.1 M
HOLE OFF THE BOTTOM AND A LEAST DEPTH OF 19m.

TGT 141.54


LEAST DEPTH

62'

18.9m + 9m

HT OFF
BOTTOM
1.1m

1.4m

A hand-drawn diagram showing a cross-section of a submerged object. A vertical line from the top surface to the object is labeled 'LEAST DEPTH' and '62'' (18.9m + 9m). The object is a cylinder with a circular end face on the left, shaded with horizontal lines. A vertical dimension line to the left of the object is labeled 'HT OFF BOTTOM 1.1m'. A horizontal dimension line below the object is labeled '1.4m'. The object is situated between two horizontal lines representing the water surface and the seabed.

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



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Ocean and Earth Sciences
Rockville, Maryland 20852

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: June 26, 1992

MARINE CENTER: Atlantic

OPR: J461

HYDROGRAPHIC SHEET: H-10423

LOCALITY: Gulf of Mexico, Southeast Approach to Mobile Bay,
Alabama

TIME PERIOD: April 13 - May 12, 1992

TIDE STATIONS USED: 873-5180 Dauphin Island, AL
Lat. $30^{\circ} 15.0'N$ Lon. $80^{\circ} 04.5'W$

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 time correction and a X1.23 range ratio to
Dauphin Island, Alabama (873-5180).

NOTE: Hourly heights are tabulated on Central Standard Time.


CHIEF, DATUMS SECTION



01/06/94

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H-10423

NUMBER OF CONTROL STATIONS		5
NUMBER OF POSITIONS		1618
NUMBER OF SOUNDINGS		11368
	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	80	04/06/93
VERIFICATION OF FIELD DATA	116	03/19/93
ELECTRONIC DATA PROCESSING	52	
QUALITY CONTROL CHECKS	33	
EVALUATION AND ANALYSIS	53	03/24/93
FINAL INSPECTION	56	01/03/94
TOTAL TIME	390	
ATLANTIC HYDROGRAPHIC SECTION APPROVAL		01/05/94

**COAST AND GEODETIC SURVEY
ATLANTIC HYDROGRAPHIC SECTION
EVALUATION REPORT**

SURVEY NO.: H-10423

FIELD NO.: HE-10-2-92

Alabama, Gulf of Mexico, Southeast Approach to Mobil Bay

SURVEYED: 13 April through 11 May 1992

SCALE: 1:10,000

PROJECT NO.: OPR-J461-HE-92

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

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

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

Surveyed by.....M. S. Abbott
.....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. No unusual problems were encountered during office processing.

c. 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 this survey on the NAD 27 move the projection lines 0.745 seconds (22.931 meters or 2.29 mm at the scale of the survey) north in latitude, and 0.019 seconds (0.521 meters or 0.05 mm at the scale of the survey) east in longitude.

b. There is no shoreline within the limits of this survey.

3. HYDROGRAPHY

a. Soundings at crossings are in good 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 were drawn in their entirety. Dashed curves have been added to better show 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 conform to the requirements of the HYDROGRAPHIC MANUAL (HM), SIDE SCAN SONAR MANUAL (SSSM), and FIELD PROCEDURES MANUAL (FPM).

5. JUNCTIONS

H-10394 (1991) to the northwest
H-10418 (1992) to the north

Adequate junctions were effected between the present survey and the junctional surveys. Present survey depths are in harmony with the charted hydrography to the east, south and west.

6. COMPARISON WITH PRIOR SURVEYS

a. Hydrographic

H-10206 (1985) 1:40,000
H-10179 (1985-87) 1:20,000

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

Prior survey depths from H-10206 (1985) are generally in good agreement with the present survey depths. Scattered prior depths throughout the common area of the surveys vary plus or minus (\pm) 0² meter (1 ft). A few prior survey depths

in the southern portion of the present survey are 1 to 1⁹ meters (3 to 6 ft) shoaler than the present survey depths. The bottom is irregular in this area.

Prior survey depths from H-10179 (1985-87) are in good agreement with the present survey depths. Some prior survey depths that are 70 feet (23³ m) and deeper, show a trend of being 3 feet (1 m) deeper than present survey depths.

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

b. Wire Drag

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

One hang and six groundings that originate with the prior survey fall within the present survey area. The following should be noted:

An uncharted anchor, in Latitude 30°04'49.74"N Longitude 87°59'28.98"W, hung at 60 feet (18³ m) and subsequently cleared by 60 (18³ m) and 61 feet (18⁶ m) is not considered disproved by the present survey. Present survey depths in the vicinity are 62 to 63 feet (19 to 19³ m). The anchor, also shown on prior survey H-10206 (1985), has been brought forward to supplement the present survey. No change in charting is recommended.

The six uncharted groundings within the limits of the present survey were considered disproved by prior survey H-10206 (1987). No change in charting is recommended.

Scattered conflicts of 1 to 5 feet (0³ to 1⁵ m) were noted between the present survey and the prior wire drag survey effective clearance depths.

<u>CLEARANCE</u> <u>DEPTH ft/m</u>	<u>LATITUDE (N)</u>	<u>LONGITUDE (W)</u>	<u>PRESENT SURVEY</u> <u>DEPTH ft/m</u>
61/18 ⁶	30°04'38"	87°59'06"	56-60/17 ⁰ -18 ³
60/18 ³	30°04'52"	87°58'32"	59-60/18 ⁰ -18 ³
55/16 ⁷	30°03'08"	87°57'17"	54-55/16 ⁴ -16 ⁷
58/17 ⁶	30°02'36"	87°57'20"	57-58/17 ³ -17 ⁶
59/18 ⁰	30°02'37"	87°56'48"	56-59/17 ⁰ -18 ⁰
58/17 ⁶	30°01'53"	87°57'55"	57-58/17 ³ -17 ⁶
58/17 ⁶	30°02'52"	87°58'00"	55-59/16 ⁷ -18 ⁰

These differences may be attributed to subsequent

change in the bottom configuration. It is recommended that these conflicts be disregarded.

7. COMPARISON WITH CHART 11376 (42nd Ed., Jan 16/92)
11360 (32nd Ed., Mar 30/91)

a. Hydrography

The charted hydrography originates with the previously discussed prior surveys and requires no further discussion. An adequate chart comparison is discussed in section N. of the Descriptive Report. The following should be noted:

1) An uncharted obstruction with a depth of 19 meters (62 ft) was located and developed by the hydrographer on the west side of the safety fairway in Latitude 30°02'15.56"N, Longitude 87°58'05.73"W. The obstruction is shown on the present survey. It is recommended that the obstruction not be charted because of shoaler depths of 18² meters (59 ft) in the immediate area and the controlling depth for the Entrance Channel to Mobile Bay is 14³ meters (47 ft).

2) A charted platform in Latitude 30°04'40"N, Longitude 88°00'46"W was located by the present survey in Latitude 30°04'41.09"N, Longitude 88°00'45.76"W. The present position is in good agreement with the charted position that originates with the Listing of Offshore Oil, Gas, Mineral & Related Structures. No change in charting is recommended.

The present survey is adequate to supersede the charted hydrography in the common areas.

b. Dangers to Navigation

There were no dangers to navigation submitted by the field unit. No dangers were noted during office processing.

c. Aids to Navigation

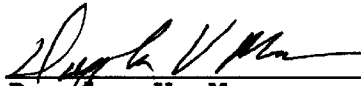
There were no fixed or floating aids to navigation within the limits of this survey.

8. COMPLIANCE WITH INSTRUCTIONS

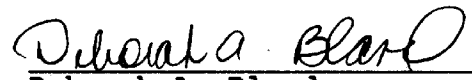
This survey complies with the Project Instructions.

9. ADDITIONAL FIELD WORK

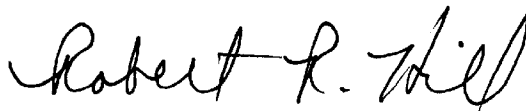
This is an adequate basic survey. No additional work is recommended.



Douglas V. Mason
Cartographic Technician
Verification of Field Data



Deborah A. Bland
Senior Cartographic
Technician
Evaluation and Analysis



Robert R. Hill
Senior Cartographic Technician
Verification Check

APPROVAL SHEET
H-10423

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 disapproval 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 Date: Jan. 5, 1994
Richard H. Whitfield
Cartographer, Atlantic Hydrographic 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: January 5, 1994
Nicholas E. Perugini, LCDR, NOAA
Chief, Atlantic Hydrographic Section

Final Approval:

Approved: J. Austin Yeager Date: 1/28/94
J. Austin Yeager
Rear Admiral, NOAA
Director, Coast and Geodetic Survey

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10423

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
11377	3/10/94	L. Arkin	Full Part Before After Marine Center Approval Signed Via Drawing No.
11376	3/10/94	L. Arkin	Full Part Before After Marine Center Approval Signed Via Drawing No.
11360	5/10/94	Dan Fluck	Full Part Before After Marine Center Approval Signed Via Drawing No. THRU 11376
11006	7-18-95	WJ Fij	Full Part Before After Marine Center Approval Signed Via Drawing No. 39 thru ct 11360 #34
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
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			Full Part Before After Marine Center Approval Signed Via Drawing No.

<u>CHART</u>	<u>compiler</u>	<u>ACTION</u>	<u>DATE</u>
11377	L. Arhman	Fully APP'D DWG #	3/10/94
11376	L. Arhman	Fully APP'D	3/11/94
11360	Don Black	FULLY APP'D THAN 11376	5/10/94