

10537

NOAA FORM 78-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic/Side Scan Sonar..

Field No. WH-10-4-94.....

Registry No. H-10537.....

LOCALITY

State Delaware.....

General Locality Delaware Bay.....

Sublocality 2 NM South of the.....

Lower Middle.....

19 94

CHIEF OF PARTY

..... CDR J.D. Wilder.....

LIBRARY & ARCHIVES

DATE August 8, 1995.....

NOAA FORM 77-28
(11-72)

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

REGISTER NOS.

HYDROGRAPHIC TITLE SHEET

H-10537

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

FIELD NO.

WH-10-4-94

State Delaware

General locality Approaches to Delaware Bay

Locality 2 NM South of The Lower Middle, Delaware Bay

Scale 1:10000 Date of Survey May 6 - 18, 1994

Instructions dated February 3, 1993 Project No. OPR-D368-WH-94

Vessel NOAA Ship WHITING

Chief of Party Commander John D. Wilder, NOAA
J.D. Wilder, S.R. Bamum, J.S. Verlaque, W.G. Kilt, J.L. Riley, E.W. Berkowitz, K.A. Pavelle,
 F.R. Cruz, J.S. Gaskin, M.M. Cisternelli, B.C. Detrich

Surveyed by F.R. Cruz, J.S. Gaskin, M.M. Cisternelli, B.C. Detrich

Soundings taken by echo sounder DSF-6000N

Graphic record scaled by WHITING Survey Personnel

Graphic record checked by WHITING Survey Personnel

Protracted by N/A Automated plot by HP 7959B, Bruning

Verification by ATLANTIC HYDROGRAPHIC BRANCH PERSONNEL

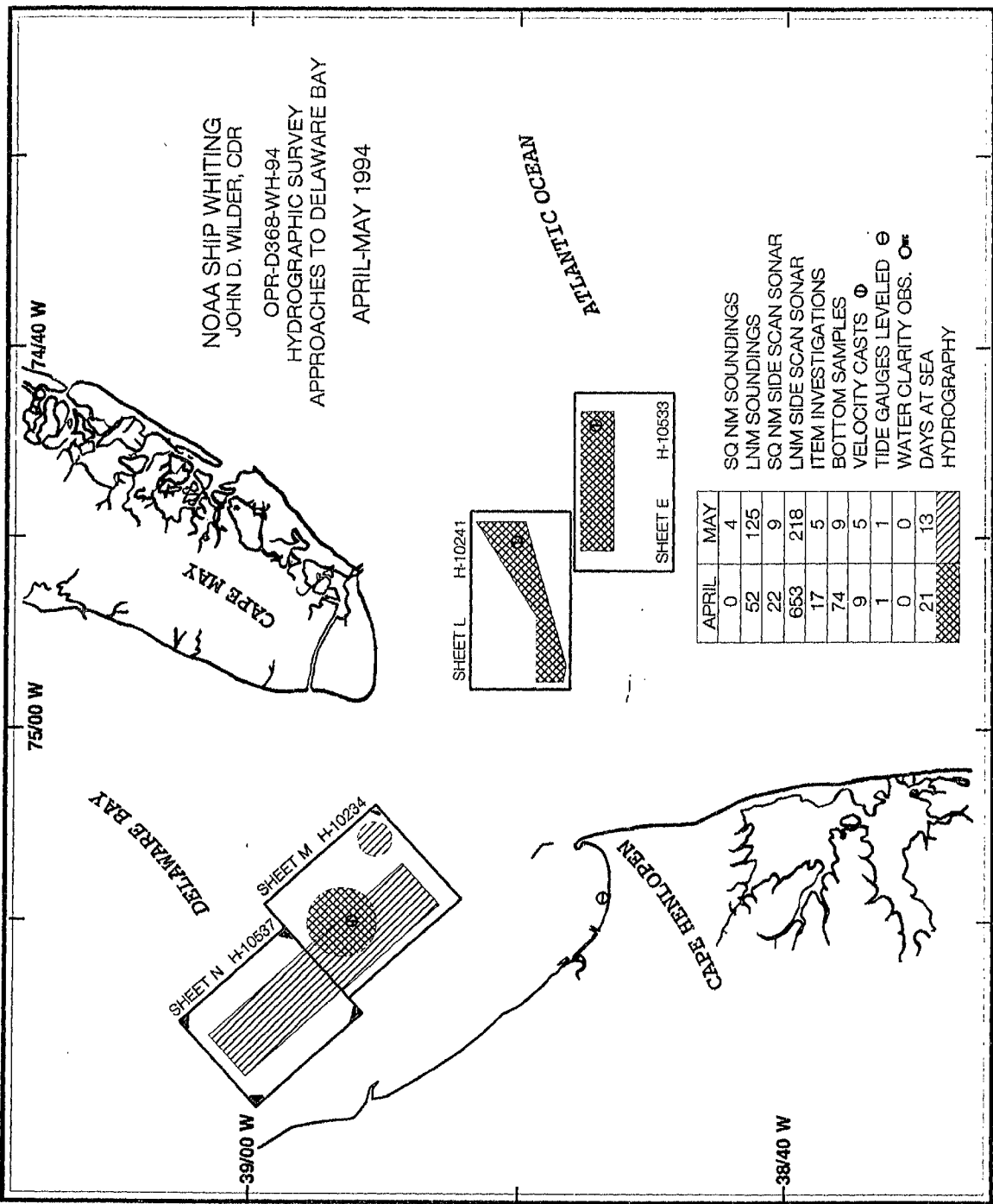
Soundings in MLLW Meters

REMARKS: Time Zone used, 0 (UTC)
100% Side Scan Sonar coverage

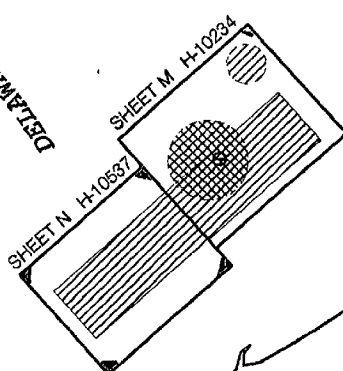
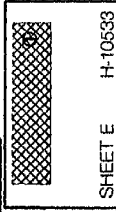
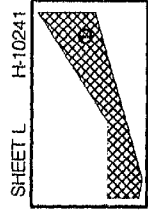
NOTES IN THE DESCRIPTIVE REPORT WERE MADE IN RED
DURING OFFICE PROCESSING.

NOV 013 / SURF ✓ 8/29/95 SJV

SC 12-19-96
AUG 8 1995



NOAA SHIP WHITING
 JOHN D. WILDER, CDR
 OPR-D368-WH-94
 HYDROGRAPHIC SURVEY
 APPROACHES TO DELAWARE BAY
 APRIL-MAY 1994



	APRIL	MAY
SQ NM SOUNDINGS	0	4
LNM SOUNDINGS	52	125
SQ NM SIDE SCAN SONAR	22	9
LNM SIDE SCAN SONAR	653	218
ITEM INVESTIGATIONS	17	5
BOTTOM SAMPLES	74	9
VELOCITY CASTS	9	5
TIDE GAUGES LEVELED	1	1
WATER CLARITY OBS.	0	0
DAYS AT SEA	21	13
HYDROGRAPHY		

SQ NM SOUNDINGS
 LNM SOUNDINGS
 SQ NM SIDE SCAN SONAR
 LNM SIDE SCAN SONAR
 ITEM INVESTIGATIONS
 BOTTOM SAMPLES
 VELOCITY CASTS
 TIDE GAUGES LEVELED
 WATER CLARITY OBS.
 DAYS AT SEA
 HYDROGRAPHY

**DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY
OPR-D368-WH
WH-10-4-94
H-10537**

**NOAA SHIP WHITING
CDR John D. Wilder, NOAA
Commanding Officer**

A. PROJECT

Project OPR-D368-WH is a basic hydrographic survey with side scan sonar (SSS) bottom coverage. The purpose of the project is to update the existing nautical charts and to locate any wrecks and obstructions in or near the approaches to Delaware Bay.

Project OPR-D368-WH consists of ten survey sheets. The survey described in this report was designated as sheet 'N'. This survey was assigned field sheet number WH-10-4-94 and registry number H-10537.

Hydrographic survey H-10537 was conducted in response to a request by the Delaware Bay and River Pilots Association to survey the anchorage area located 2 nm south of The Lower Middle, Delaware Bay, DE. The anchorage is known locally as Big Stone Anchorage. Survey operations were conducted in accordance with Hydrographic Project Instructions OPR-D368-WH dated February 23, 1993. Changes to the original project instructions are as follows:

Change No. 1	May 19, 1993
Change No. 2	July 23, 1993
Change No. 3	July 30, 1993
Change No. 4	March 8, 1994

Changes to the Automated Wreck and Obstruction Information System (AWOIS) listing were issued on May 18, 1993 (Change No. 2) and on February 14, 1994 (Change No. 4). Survey H-10537 did not contain any AWOIS items.

B. AREA SURVEYED

Hydrographic survey H-10537 is located 2 nm south of The Lower Middle, Delaware Bay, DE. The survey area encompasses the northern half of the Big Stone Anchorage area and is bounded by the four corners: 38°57'05.7" N and 075°12'08.9" W, 38°57'44.1" N and

075°10'43.8" W, 39°01'28.5" N and 075°13'29.8" W, 39°00'49.8" N and 075°14'54.6" W.

Survey operations began on May 6, 1994 (DN 126) and ended on May 18, 1994 (DN 138).

C. SURVEY VESSELS

WHITING (VESNO 2930) was used for main-scheme side scan sonar, sounding data acquisition, and velocity casts. Launch 1014 (VESNO 2932) was used for crosslines, sounding data development, SSS contact investigations, aids-to-navigation detached positions, bottom samples, and as a platform for diver and echosounder least depth determination on significant contacts. Launch 1015 (VESNO 2931) was used for SSS main-scheme and contact investigations.

No unusual vessel configurations were used nor were any problems encountered.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Survey data acquisition and processing were accomplished using the HDAPS system with the following software:

<u>PROGRAM NAME</u>	<u>VERSION</u>	<u>DATE INSTALLED</u>
BACKUP	2.00	March 28, 1994
BASELINE	1.14	March 28, 1994
BIGABST	2.07	March 28, 1994
BIGAUTOST	3.01	March 28, 1994
BLKEDIT	2.02	March 28, 1994
CARTO	2.12	March 31, 1994
CLASSIFY	1.01	March 28, 1994
CONTACT	2.34	March 31, 1994
CONVERT	3.62	March 28, 1994
DAS_SURV	6.67	March 31, 1994
DIAGNOSE	3.03	March 28, 1994
DISC_UTIL	1.00	March 28, 1994
DP	2.14	March 28, 1994
EXCESS	4.21	March 28, 1994
FILESYS	3.21	March 28, 1994
GRAFEDIT	1.06	March 28, 1994
HIPSTICK	1.01	March 28, 1994
HPRAZ	1.26	March 28, 1994
INVERSE	2.01	March 28, 1994
LISTDATA	1.02	March 28, 1994
LOADNEW	2.10	March 28, 1994

<i>LSTAWOIS</i>	3.07	<i>March 31, 1994</i>
<i>MAINMENU</i>	1.20	<i>March 28, 1994</i>
<i>MAN_DATA</i>	2.01	<i>March 28, 1994</i>
<i>NEWPOST</i>	6.01	<i>March 28, 1994</i>
<i>PLOTALL</i>	2.27	<i>March 31, 1994</i>
<i>POINT</i>	2.10	<i>March 28, 1994</i>
<i>PREDICT</i>	2.01	<i>March 28, 1994</i>
<i>PRESURV</i>	7.08	<i>March 31, 1994</i>
<i>PRINTOUT</i>	4.03	<i>March 28, 1994</i>
<i>QUICK</i>	2.04	<i>March 28, 1994</i>
<i>RAMSAVER</i>	1.02	<i>March 28, 1994</i>
<i>REAPPLY</i>	2.10	<i>March 28, 1994</i>
<i>RECOMP</i>	1.02	<i>March 28, 1994</i>
<i>SCANNER</i>	1.00	<i>March 28, 1994</i>
<i>SELPRINT</i>	2.04	<i>March 28, 1994</i>
<i>SYMBOLS</i>	2.00	<i>March 28, 1994</i>
<i>VERSIONS</i>	1.00	<i>March 28, 1994</i>
<i>ZOOMEDIT</i>	2.24	<i>March 31, 1994</i>

Program *SHIPDIM* (version 1.2) was used for DGPS performance checks. Sound velocity corrections were determined using programs *CAT* (version 2.00) and *VELOCITY* (version 2.10).

There were no nonstandard automated acquisition or processing methods used.

E. SIDE SCAN SONAR EQUIPMENT

Side scan sonar (SSS) operations were conducted using an EG&G model 260 slant-range corrected SSS recorder and an EG&G 272-TH dual-channel, single frequency towfish. The towfish was operated on the 100 kHz frequency and configured with a 20° beam depression. The following sonar equipment was used throughout the survey:

<u>VESNO</u>	<u>Type</u>	<u>S/N</u>	<u>DN</u>	<u>Fix Numbers</u>
2930	Towfish	16699	126-138	6000-6940
2930	Recorder	16670	126-138	6000-6940
2931	Towfish	11908	130	0001-0021
2931	Towfish	16835	130	0001-0021
2932	Towfish	16699	128-131	3000-3501
2932	Recorder	16671	128-131	3000-3501

The towfish was deployed from a Reuland winch (model number 8377-XF5461A, S/N 814861A-1) on the stern of *WHITING*. The SSS towfish was maintained at a height off the bottom of 8 to 20 percent of the range scale and operations were limited to a speed of 6 knots

or slower.

In order to achieve 100% SSS coverage, main-scheme lines were run at a spacing of 150 meters on the 100-meter range scale. Adequate SSS coverage was determined by producing a single swath plot and ensuring overlap between adjacent lines.

Confidence checks were performed on a routine basis by noting changes in bottom texture across the sonagram, extending out to the outer edges of the range. Confidence checks were also taken on buoys or contacts when convenient.

All significant contacts were measured off the sonagram and entered into an HDAPS contact table. WHITING hydrographers determined contact heights, positions, and cross-reference correlations using the HDAPS Contact Utility Program. The items were then further examined by diver or echosounder investigation. Refer to Section N and Separate V for more information.

F. SOUNDING EQUIPMENT

A Raytheon Digital Survey Fathometer (DSF 6000N) echo sounder was used to measure bottom depths during the survey. The DSF 6000N produced a graphic record of the high frequency (100 kHz) and low frequency (24 kHz) bottom depth. The high and low frequency digital depths were recorded by the HDAPS acquisition system. High frequency depths were selected as the primary depths and are shown on the sounding plots. Echograms were carefully reviewed for significant features along the track line. Any features on the graphic record that were not selected as primary soundings were manually selected. Some areas in the survey were dominated by many large sand waves. In these areas of uniformly periodic large sand waves, only the peaks were manually added to the primary soundings per direction of N/CG244 (see section O). The low frequency analog trace was 0.1 to 0.2 meters shoaler than the high frequency trace in some of the sand wave areas located near the southern half of the survey area. This difference appeared to be the result of unconsolidated sediment or "fluff". WHITING hydrographers did not insert these low frequency soundings into the primary data record.

Electronic technicians performed accuracy checks and preventive maintenance on all of the DSF-6000N echosounders used. As a result, the echosounder on WHITING (S/N A106N), launch 1014 (S/N C076) and launch 1015 (S/N A105N) operated throughout the survey period without any major problems. On DN 138 the echosounder on WHITING (S/N A106N) was replaced with A112N (fixes 6891-6940).

Diver-determined least depths were measured with a pneumatic depth gauge (S/N 138921-30). The annual calibration for pneumatic gauge 138921-30 was performed on November 29, 1993. The pneumatic gauge was used in accordance with Hydrographic Guideline No. 55 and a system check was performed on DN 131 to ensure the pneumogauge was working properly.

G. CORRECTIONS TO SOUNDINGS

Sound-velocity profiles of the water column were determined using a Seacat Conductivity, Temperature and Depth (CTD) profiler (model SBE 19, S/N 286). The CTD's annual calibration was performed on December 17, 1993.

After each CTD cast, programs *CAT* (version 2.00) and *VELOCITY* (version 2.10) were used to process the data, select significant data points, and create a corrector table for each vessel. The velocity correctors were manually entered into each HDAPS velocity table. The correctors were applied to both high and low frequency DSF-6000N beams during acquisition. Velocity profile data are in the Separates submitted with this survey.

Data Quality Assurance (DQA) for the Seacat CTD profiler was performed by using a hydrometer and a thermometer to measure the density and temperature of a surface water sample taken during each CTD cast; program *CAT* compared these values to the CTD surface values, and confirmed that the velocity probe was working properly. There were no variations in instrument initials. Two velocity casts were conducted for H-10537:

<u>DN</u>	<u>Vel.Table#</u>	<u>Latitude</u>	<u>Longitude</u>
126	21, 22	38° 56.15' N	075° 09.69' W
138	23	39° 00.20' N	075° 13.70' W

All sounding corrections were applied to both the narrow (100 kHz) and wide (24 kHz) DSF-6000N beams. DSF-6000N echosounders on WHITING (S/N A106N), launch 1014 (S/N C076) and launch 1015 (S/N A105N) operated throughout the survey period without any major problems. On DN 138 the echosounder on WHITING (S/N A106N) was replaced with A112N (fixes 6891-6940).

Bar checks were performed on launch 1014 and launch 1015 (DSF-6000N S/N C076 and A105N, respectively) in accordance with the requirements stated in the Field Procedures Manual. No corrections to soundings were applied based on bar check data.

New leadlines were made on April 10, 1993. Calibrations were performed on March 17, 1994 and the leadline error was found to be negligible. A leadline comparison was performed on WHITING (DSF-6000N S/N A106N) on May 11, 1994 (DN 131). On average, the leadline reading was less than 0.1 meters deeper than the high frequency digitized reading and less than 0.2 meters shoaler than the low frequency digitized reading. No corrections for the differences were applied to the survey data.

The correction for the static draft for launches 1014 and 1015 is 0.55 meters, measured on July 28, 1993. The correction for WHITING's static draft is 3.2 meters, a historical value that WHITING divers confirmed by pneumatic depth gauge on May 20, 1993.

Settlement and squat measurements for launches 1014 (Offset Table 2) and 1015 (Offset

Table 1) were conducted and correctors determined on April 4, 1994. The correctors were applied in real time throughout the survey. Settlement and squat measurements for WHITING were conducted and correctors determined on November 10, 1993. The correctors were entered in Offset Table 9 and applied in real time throughout the survey. Settlement and squat corrector tables are in Separate IV. *DATA FILED WITH ORIGINAL FIELD RECORDS.*

For data acquired by WHITING, the HDAPS data acquisition computer logged heave data from a heave, roll, and pitch sensor (HIPPI, S/N 19109-C). Heave correctors were applied in post-processing. Heave correctors were applied during post processing for launches 1014 and 1015 by manually scanning the echograms.

The tidal datum for this project was Mean Lower Low Water. The operating tide station at Breakwater Harbor in Lewes, Delaware (855-7380) served as direct control for datum determination. Mr. Larry Nieson, Atlantic Operations Group, N/OES213, confirmed the proper operation of the tide station during the survey. This station also served as the reference station for predicted tides. Time and height correctors for the project were as follows:

	<u>Time Correction</u>	<u>Height Ratio</u>
High Water:	-0 hr 18 min	x1.15
Low Water:	-0 hr 18 min	x1.15

Tidal data used during data acquisition were taken from Table 2 of the East Coast of North and South America Tide Tables and were applied on-line to the digital data using HDAPS software. The tidal data, in digital form, were received on floppy disk from N/CG24, Hydrographic Surveys Branch. A request for smooth tides was submitted to Product and Services Branch, Datum Section, N/OES231 on May 27, 1994. *APPROVED TIDES WERE APPLIED DURING OFFICE PROCESSING.*

Opening and closing levels were conducted at the Breakwater Harbor tide station on March 30, 1994, and May 7, 1994, respectively. The levels confirmed that the tide staff and marks were undisturbed.

H. CONTROL STATIONS *SEE ALSO EVALUATION REPORT.*

The horizontal datum for this project is the North American Datum of 1983 (NAD-83). Two B-order horizontal control stations were used as DGPS reference stations for this survey: one at Cape Henlopen, Delaware and one at Cape Henry, Virginia. The adjusted NAD-83 positions, computed by GPS methods, were provided by LT Jeffrey Ferguson of the Hydrographic Surveys Branch, N/CG24, on April 3, 1992. The positions are as follows:

	<u>Latitude</u>	<u>Longitude</u>	<u>Frequency</u>
Cape Henry	36° 55' 37.580" N	076° 00' 23.884" W	289 kHz
Cape Henlopen	38° 46' 36.421" N	075° 05' 15.667" W	298 kHz

The Cape Henlopen beacon was used for control while on-line; the Cape Henry served as a check station for performance checks.

I. HYDROGRAPHIC POSITION CONTROL

A Differential Global Positioning System (DGPS) was used as the navigation system for this survey. WHITING used two Ashtech Sensor GPS receivers with two Communications Systems International, Inc. (CSI) model MBX1 differential radio receivers supplying correctors for DGPS navigation. Launches 1014 and 1015 used a similar system, but with only one Ashtech/CSI set each. Ashtech receivers were initialized by HDAPS and CSI receivers were initialized with CSI firmware via controls on the front of each unit. On board WHITING, only one DGPS receiver drawer sent navigational output to HDAPS; the secondary drawer was used in conjunction with the primary drawer for DGPS performance checks.

DGPS positioning was accomplished in accordance with the Field Procedures Manual (FPM), section 3.4. Horizontal Dilution of Precision (HDOP) limits were computed as required in section 3.4.2 of the FPM. An HDOP limit of 3.6 for project OPR-D368 was calculated for the Cape Henlopen differential beacon, based on a maximum distance of 50 miles from the beacon and a survey scale of 1:10000. Occasionally, changes in the number of satellites in view would cause DGPS position jumps. These sporadic, high-HDOP position flyers were smoothed in post-processing using HDAPS Graphic Edit.

The serial numbers of the Ashtech Sensor and MBX1 receivers used are as follows:

<u>Item</u>	<u>Serial Number</u>
Primary System:	
Ashtech Sensor	700417B1193
CSI MBX 1	1081
Secondary System:	
Ashtech Sensor	700417B1194
CSI MBX1	1079
Launch 1014 System:	
Ashtech Sensor	700417B1203
CSI MBX1	1078
Launch 1015 System:	
Ashtech Sensor	700417B1191
CSI MBX1	1080

DGPS performance checks for WHITING were conducted using the program *SHIPDIM*. *SHIPDIM* uses the two reference station method as described in the FPM, section 3.4.5. All DGPS performance checks confirmed that WHITING's DGPS positioning systems were operating properly and accurately. A summary of the DGPS performance checks are in

Separate III. *

Performance checks for each launch's DGPS positioning system were conducted with each launch securely housed in WHITING's davits. Simultaneous HDAPS positions were compared between WHITING and each launch; an offset in distance and azimuth was then calculated between the ship and each launch system. No more than 4 meters of error was observed.

DGPS antenna offsets and laybacks were measured on March 19, 1993, for WHITING and on July 28, 1993, for launches 1014 and 1015. Offsets and laybacks were measured using the 100 kHz (high frequency) echo-sounder transducer as the reference. Antenna heights were also measured on the same respective dates shown above, using the waterline as the reference. Offsets and laybacks were applied by HDAPS on-line. A minimum of four satellites were used during survey H-10537 (1:10000), providing altitude unconstrained positioning. All offset, layback and height data are included in the Separates. ✕

Offsets and laybacks for WHITING's SSS towfish A-frame were measured on July 27, 1992, using the forward 100 kHz (high frequency) transducer as the reference. The A-frame height was measured from the water line on the same date. All offset, layback and height data were applied by HDAPS on-line. These data are included in the Separates. ✕

The SSS towing boom offset and layback corrections for each launch were measured on July 28, 1993, and verified on April 5, 1994.

J. SHORELINE

There is no shoreline within the boundaries of this survey.

K. CROSSLINES

A total of 12 nautical miles of crosslines were run during survey H-10537, or approximately 8% of the total linear nautical miles of main-scheme lines. Crossline and main-scheme agreement was adequate (predicted tides). No errors greater than 0.5 meters were observed.

L. JUNCTIONS

Survey H-10537 is bordered on the south by a concurrent OPR-D368-WH survey, H-10234 (1:10000). Agreement between the two surveys is excellent, with corresponding soundings differing by no more than 0.2 meters. *CONCUR AN ADEQUATE JUNCTION WAS EFFECTED BETWEEN THE TWO SURVEYS DURING OFFICE PROCESSING.*
✕ FILED WITH ORIGINAL FIELD RECORDS.

M. COMPARISONS WITH PRIOR SURVEYS SEE ALSO THE EVALUATION REPORT.

Soundings from prior survey H-9202 (WH-20-2-71, 1:20000, NAD27) were compared to soundings from survey H-10537. All of the sounding data from H-10537 were 'excessed' via the HDAPS Excess Sounding Data utility. For prior survey comparison, the shoalest (excess level 0) soundings were then plotted in feet at a scale of 1:20000. An NAD27 origin shift was drawn on the excess plot utilizing program *NADCON* (version 1.01); the magnitude of the total shift was approximately 34 meters.

The majority of the corresponding soundings from survey H-9202 and H-10537 differed by no more than 2 feet. ^(0.6m) Some sporadic deeps were found during survey H-10537 that were much as as 14 feet deeper than the H-9202 soundings immediately surrounding the deep. These observed differences are to be expected, given the increased sounding resolution inherent in a larger scale survey. CONCUR

DID NOT FIND THE 14 FT DEEP DEPTH COMPARISON DURING OFFICE PROCESSING.
PRESENT SURVEY IS ADEQUATE TO SUPERSEDE PRIOR SURVEY IN THE COMMON AREA.

N. ITEM INVESTIGATIONS

Summary of items investigated:

<u>SECTION</u>	<u>NAME</u>	<u>STATUS</u>
N.1	6885.40S	Diver least depth acquired
N.2	18.42S	Diver least depth acquired
N.3	15.53P	Echosounder least depth acquired
N.4	13.58P	Echosounder least depth acquired
N.5	R N 'LMW' PA Wreckage	Detached position of superstructure

N.1 Contact #6885.40S

Latitude: 38° 57' 39.316" N
Longitude: 075° 10' 52.909" W
Cross Reference: 6724.00P

Item 6885.40S was found during 100% main scheme SSS coverage and was further investigated using the 50-meter range scale. The contact height measured from side scan sonar was significant, warranting a diver investigation. Echosounding was used to pinpoint a drop position for WHITING divers.

Divers descended on the contact and discovered a concrete block measuring approximately 4 feet long, 3 feet wide, and 3 feet high. A 19.5-meter least depth (DP #3480, DN 131), adjusted for ~~predicted~~ tides, was taken on the block with a pneumatic depth gauge (S/N 138921-30). The average water depth immediately surrounding the area was 20.2 meters. ~~(predicted tides):~~

WHITING recommends that an obstruction with a least depth known by diver of 19.5 meters (64FT) ✓
be charted at 38° 57' 39.316" N, 075° 10' 52.909" W, AND A DANGER CURVE. CONCUR

N.2 Contact #18.42S

Latitude: 38° 57' 47.679" N
Longitude: 075° 11' 22.911" W
Cross References: 20.25S, 6822.56S

Item 18.42S was found during 100% main scheme SSS coverage and was further investigated using the 50-meter range scale. The contact height measured from side scan sonar was significant, warranting a diver investigation. Echosounding was used to pinpoint a drop position for WHITING divers.

Divers descended on the contact and discovered a concrete block cracked in the middle, measuring approximately 8 feet long, 4 feet wide, and 3 feet high. A 17.6-meter least depth (DP #3481, DN 131), adjusted for predicted tides, was taken on the block with a pneumatic depth gauge (S/N 138921-30). The average water depth immediately surrounding the area was 18.5 meters. (predicted tides). A smaller concrete block measuring 4 feet long, 3 feet wide and 1 feet high was discovered approximately 35 feet, bearing 300° magnetic from the least depth block.

WHITING recommends that an obstruction with a least depth known by diver of 17.6⁴ meters (57F) ✓
be charted at 38° 57' 47.679" N, 075° 11' 22.911" W, AND A DANGER CURVE. CONCUR

N.3 Contact #15.53P

Latitude: 38° 58' 42.177" N
Longitude: 075° 12' 00.342" W
Cross Reference: 6817.32P

Item 15.53P was found during 100% main scheme SSS coverage and was further investigated using the 50-meter range scale. The contact height measured from side scan sonar was significant and an echosounder investigation was conducted.

Launch 1014 (VESNO 2932) was used to run 1-meter spaced echosounder lines centered over the average SSS position for the contact. A least depth of 17.3 meters (predicted tides) was obtained by a DSF-6000N fathometer (DP #3484, DN 131). The low-frequency echo return and the high frequency echo return coincide at the point of least depth on the echogram; this depth can confidently be considered the least depth because the object is small. Additionally, deeper low-frequency echo returns were recorded on lines run adjacent to the least depth position. The average water depth immediately surrounding the area was 18.0 meters. (predicted tides). A 17.2 meter bottom sounding (predicted tides) was found less than 50 meters to the east and a 16.9 meter bottom sounding (predicted tides) was found

approximately 70 meters to the north-northeast of the object. Due to the close proximity of shoaler depths, WHITING recommends that contact #15.53P not be charted. CONCUR

N.4 Contact #13.58P

Latitude: 38° 58' 51.129" N
Longitude: 075° 12' 11.985" W
Cross Reference: 6873.28P

Item 13.58P was found during 100% main scheme SSS coverage and was further investigated using the 50-meter range scale. The contact height measured from side scan sonar was significant and an echosounder investigation was conducted.

Launch 1014 (VESNO 2932) was used to run 1-meter spaced echosounder lines centered over the average SSS position for the contact. A least depth of 17.3 meters (~~predicted tides~~^{APPROVED}) was obtained by a DSF-6000N fathometer (DP #3500, DN 131). The low-frequency echo return and the high frequency echo return coincide at the point of least depth on the echogram; this depth can confidently be considered the least depth because the object is small. Additionally, several deeper low and high-frequency echo returns were recorded on lines run adjacent to the least depth position. The average water depth immediately surrounding the area was 17.5 meters. (~~predicted tides~~). A 17.1 meter bottom sounding (~~predicted tides~~) was found approximately 60 meters to the NNW and a 17.3 meter bottom sounding (~~predicted tides~~) was found approximately 5 meters to the NW of the object. Due to the close proximity of a shoaler depth, WHITING recommends that contact #13.58P not be charted. CONCUR

N.5 Charted Wreck near R N 'LMW' buoy (Chart 12304, 1:80000)

Charted Latitude: 39° 00' 08.4" N
Charted Longitude: 075° 12' 17.1" W
Charted Feature: PA Wreckage

WHITING hydrographers approached the visible wreck in launch 1014 at approximately 1800 UTC on DN 129. A pipe-like object attached to the wreck extended approximately 4 feet above the sea surface at the time of observation. Approaching the visible portion of the wreck from the west, a detached position (DP #3475, DN 129) was taken at the limit of safe navigation for launch 1014. Similarly, the wreck was approached from the east and a position was obtained at the limit of safe navigation (DP #3477, DN 129). The two detached positions taken on either side of the wreck are spaced approximately 80 meters apart. The average of the two positions is 39° 00' 08.50³" N, 075° 12' 16.10⁰" W, or approximately 30 meters east of the charted position. The R N 'LMW' buoy marking the wreck is currently charted on top of the wreckage symbol. A detached position was taken on the buoy, positioning it at 39°00' 05.949"N, 075°12' 14.951"W, nearly 85 meters to the south-southwest of the average wreck DP (see section Q for recommendations).

Light List Vol. II, 1994, lists buoy R N 'LMW' as item #2215, Lower Middle Wreck Buoy, marking steamer MOHAWK. The wreck is not contained in the AWOIS listings issued on May 18, 1993 (Change No. 2) and on February 14, 1994 (Change No. 4).

WHITING recommends that the PA Wreckage charted at 39° 00' 08.4" N, 075° 12' 17.1" W be deleted. A visible wreck should be charted at 39° 00' 08.503" N, 075° 12' 16.100" W, AS SHOWN ON PRESENT SURVEY. CONCUR

O. COMPARISON WITH THE CHART SEE ALSO THE EVALUATION REPORT

Chart 12304 (1:80,000), 35th edition, January 1, 1994, is the largest scale chart that covers the survey area. No Notices to Mariners have been published for areas within the survey limits since the 28 May 1994 release.

Reports listing the uncharted submerged features discovered were submitted to the Coast Guard on June 3, 1994.

Charted depths were compared to soundings acquired during the survey. In general, sounding agreement was excellent. The majority of the charted depths agreed to within ± 0.1 meters of the acquired depths. However, on the extreme western edge of the survey sheet, charted depths differed by 0.6 meters on average, and by 1.4 meters in one instance. The differences between acquired and charted depths can be explained by the 2-percent sloping grade characterizing this area of the bottom. Crossline data confirms the sloping bathymetry; no further development is needed (see section M). CONCUR

Large sand waves exist in the southern end of the survey sheet, in an area centered on approximately 38°58.5'N, 075°12.3'W. The large sand waves cover a swath of area a few hundred meters wide to the east and west, and extend for approximately 1300 meters at 330°T and another 1300 meters at 180°T from the given geographical center. Smaller sand waves cover much of the western third of the survey area. On long stretches of bottom dominated by sand waves, only the peaks were manually inserted to the primary echosounding data per direction by N/CG244. WHITING recommends that the shoal soundings within the area of large sand waves be accompanied on the chart with a note stating "sand waves". CONCUR

In the extreme northern corner of the anchorage area, at position 39° 01' 14.4" N, 075° 13' 39.7" W, a shoal is charted as "Shoal rep 1983". The motor vessel (M/V) Ypatianna grounded on 12/30/83 in the northern end of Big Stone Anchorage in approximate position 38° 01' 14" N, 075° 13' 41" W (NAD 27). Lightering operations were conducted two days later reducing M/V Ypatianna's draft to 34 feet, and she floated free on January 1, 1984, two hours away from high tide. The USCGC Point Franklin sounded around the Ypatianna finding depths of 34-35 feet (10.4 - 10.7 meters), after applying tides. A least depth of 9.3 meters (30.5 feet), adjusted for predicted tides, was located during survey H-10537 at 39° 01' 16.801" N, 075° 13' 45.402" W, or approximately 150 meters northwest of the reported grounding. Echosounder development lines were split to a line spacing of 12 meters

around the 9.3 meter sounding, inside the anchorage area, on DN 138; no shoaler soundings were located. A small area of soundings (80 x 150 meters) ranging from 9.4 meters (31 feet) to 10.0 meters (33 feet), corrected to ^{APPROVED} predicted tides, was located less than 100 meters to the ^{SOUTH} west of the grounding position. IT IS RECOMMENDED THAT THE CHARTED NOTATION "SHOAL SEP 1983" AND THE DANGER CURVE BE DELETED AND THE AREA CHARTED AS SHOWN ON PRESENT SURVEY. A detached position was obtained on a wreck charted at the same position as buoy R N 'LMW'. Information and recommendations regarding the wreck and the buoy can be found in section N5 and section Q, respectively.

No changes to the scale, coverage, or format of Chart 12304 are recommended at this time. CONCUR

P. ADEQUACY OF SURVEY

All items found during this survey have been resolved. This survey is complete and of adequate quality to supersede all prior surveys of the area.

Q. AIDS TO NAVIGATION

Seven floating aids are located in or near the northern half of Big Stone Anchorage: yellow buoy 'B', yellow buoy 'C', yellow buoy 'D', yellow buoy 'E', yellow buoy 'F', yellow buoy 'G'. The Light List Vol. II, 1994, lists these aids to navigation as follows:

<u>Light List #</u>	<u>Aid to Navigation</u>	<u>Position</u>
2185	Lighted Buoy B, Fl Y 6s	No position listed
2190	Buoy C, Yellow can	No position listed
2195	Lighted Buoy D, Fl Y 4s	38°00.8'N 075°14.9'W
2200	Buoy E, Yellow can	No position listed
2205	Buoy F, Yellow can	No position listed
2210	Buoy G, Yellow can	No position listed
2215	Lower Middle Wreck, Buoy LMW Marks steamer MOHAWK	39°00.1'N 075°12.3'W

Chart 12304 portrays the aids to navigation as follows:

<u>Aid to Navigation</u>	<u>Position</u>
Y 'B' Fl Y 6s	38°57' 05.4"N 075°12' 10.2"W
Y C 'C'	38°58' 34.8"N 075°13' 12.6"W
Y 'D' Fl Y 4s	39°00' 49.8"N 075°14' 54.0"W
Y C 'E'	39°01' 22.9"N 075°13' 22.0"W
Y C 'F'	38°59' 17.4"N 075°11' 53.4"W
Y C 'G'	38°57' 38.2"N 075°10' 42.1"W
R N 'LMW'	39°00' 08.4"N 075°12' 17.1"W

The following table summarizes the observed characteristics of each aid to navigation, positioned in or near the northern half of Big Stone Anchorage during survey H-10537:

<u>DP/DN#</u>	<u>Aid to Navigation</u>	<u>Position</u>
3008/128	Y 'B' Fl Y 6s	38°57' 04.944"N 075°12' 11.391"W
3005/128	Y C 'C'	38°58' 34.877"N 075°13' 18.211"W
3006/128	Y 'D' Fl Y 4s	39°00' 50.681"N 075°14' 55.876"W
3007/128	Y C 'E'	39°01' 22.078"N 075°13' 21.183"W
3004/128	Y C 'F'	38°59' 22.378"N 075°11' 56.287"W
3009/128	Y C 'G'	38°57' 39.838"N 075°10' 41.819"W
3474/129	R N 'LMW'	39°00' 05.949"N 075°12' 14.951"W

The light characteristics for each aid to navigation are correct. Light List #2195 has an incorrect position listed for the Y 'D' Fl Y 4s buoy; the latitude should be 39°00.8'N, instead of 38°00.8'N. All aids to navigation adequately serve the purpose for which they were established. Chart 12304 positions a mooring buoy at approximately 38°58' 59.4"N 075°13' 56.4"W. WHITING did not observe any buoys near this position and a disapproval position was taken (DP #3472, DN 129).

R. STATISTICS

Number of Positions	1100
Main-scheme Sounding Lines (Nautical Miles)	154
Crosslines (Nautical Miles)	12
Square Nautical Miles Surveyed	5.7
Days of Production	7
Detached Positions	13
Bottom Samples	6
Tide Stations Installed	None
Current Stations	None
Number of CTD Casts	2
Magnetic Stations	None

S. MISCELLANEOUS SEE ALSO THE EVALUATION REPORT.

The majority of the bottom contours in the area surveyed are oriented 150°T/330°T. Main-scheme sounding lines on survey H-10537 were run parallel to these depth curves at a line spacing of 75-meters. Lines were run parallel to the depth contours due to the narrow width of the anchorage area; running main-scheme sounding lines across the anchorage was not efficient. On the extreme western edge of the survey sheet, adjacent sounding lines differed by an average of 1.5 meters, getting deeper with each line progressing east-northeastward, towards the centerline of the sheet. Crossline data confirms this 2-percent sloping grade; no further development was needed. CONCUR

A total of six bottom samples were taken during survey H-10537. The samples sites were scattered evenly about the area of the sheet. Bottom samples were not submitted to the Smithsonian Institution.

No anomalies in either tide or current and/or unusual magnetic variations were encountered in the survey area. No unusual submarine features were discovered.

On average, WHITING suspended side scan operations twice daily to run the engines under full load.

T. RECOMMENDATIONS SEE ALSO THE EVALUATION REPORT.

Survey H-10537 is complete and without inadequacies. See Section N for specific charting recommendations regarding obstructions. No additional fieldwork is required. There are no current plans for construction or dredging in the survey area.

U. REFERRAL TO OTHER REPORTS

There are no other relevant reports submitted as a part of OPR-D368-WH-94.

Submitted By:

Jack L. Riley
LTJG Jack L. Riley, NOAA
Junior Officer, NOAA Ship WHITING

SURVEY 4-10537
Item Number N/A
Charted (Y/N) N
Chart No. (largest scale) 12304

Danger to Nav. Letter Issued (Y/N) N
Edition 34th Date oct 29, 92

DESCRIPTION/SOURCE:

HISTORICAL POSITION: Latitude _____ SSS POSITION: Lat _____
Longitude _____ 6885.405 Long _____
Datum _____ Easting 8345
Northing 4920

SURVEY REQUIREMENTS:

METHOD OF INVESTIGATION:
Echosounder _____ Side Scan _____ Diver ✓ Other (specify) _____

DIVE DATA: Divers Pavelle / Riley
Time of Dive: Commenced 1418 , 1454 Completed 1436 1503
Current 0 Visibility 2-3 Bottom Type SILT, Shell

RESULTS OF INVESTIGATION: DIVERS DESCENDED BUOY DROPPED AT
SSS POSITION AND FOUND A ^{CONCRETE BLOCK} ~~ROCK~~ WITH 1/2' TO 1' OF
SCOUR ON THE SOUTH SIDE. THE ~~ROCK~~ ^{ROCK} STOOD
3 FT OFF THE BOTTOM. DIVER GAUGE LEAST
DEPTH WAS 68 FT.

POSITION: Date (M/D/Y) 11 MAY 94 (131) Time (UTC) 134616 Position No. 3480
Latitude 38° 57' 39.316 Longitude 75° 10' 52.909
LORAN-C: GRI (9960) W: 15846.4 X: 27208.4 Y: 42744.5 Z: 59248.0

LEAST DEPTH: Date (M/D/Y) 11 MAY 94 Time (UTC) 1459
Method of Least Depth: PNEUMO
Measured Least Depth: 1.68.1 2.67.9 3.68.0 Avg. 68.0 Units FT
Uncorrected Depth 20.7 (meters) 19.5 fm
Tide Corrector -1.3 Corrected Least Depth 19.4 (meters) (64 FT)
-1.2 fm

Recorder EWB Checked By JWR
SEE SECTION N.1., PAGE 9-10 OF DESCRIPTIVE REPORT
FOR CHARTING RECOMMENDATION.

SURVEY H-10537

Item Number N/A

Danger to Nav. Letter Issued (Y/N) N

Charted (Y/N) N

Chart No. (largest scale) 12304

Edition 34th

Date OCT 24, 92

DESCRIPTION/SOURCE:

HISTORICAL POSITION: Latitude _____ SSS POSITION: Lat _____

Longitude _____ (18.42 S) Long _____

Datum _____ 20.25 S Easting 7631

Northing 5168

SURVEY REQUIREMENTS:

METHOD OF INVESTIGATION:

Echosounder _____ Side Scan _____ Diver Other (specify) _____

DIVE DATA: Divers RILEY / Pavelle

Time of Dive: Commenced 1522 Completed 1535

Current SLACK Visibility 2-5 4-5' Bottom Type 31LT, shell

RESULTS OF INVESTIGATION: Divers DESCEND BUOY
DROPPED AT ABOVE POSITION AND LOCATED A ^{CONCRETE BLOCK} ~~ROCK~~ 2' WIDE
8' LONG BROKEN INTO TWO PIECES AT THE MIDDLE
35' AT 300M DIVERS LOCATED A SMALLER BLOCK
3' WIDE 4' LONG LEAST DEPTH ITEM STOOD
3' OFF THE BOTTOM THE SMALLER BLOCK
STOOD 1' OFF THE BOTTOM DIVER GAUGE LEAST
DEPTH WAS 61' ITEM WAS HAD HEAD GROWTH ATTACHED 3481

POSITION: Date (M/D/Y) MAY 11, 94 Time (UTC) 14017 Position No. 7626
Latitude 38° 57' 47.68" (3') Longitude 75° 11' 22.91" W
LORAN-C: GRI (9960) W: 15850.6 X: 27211.4 Y: 42745.9 Z: 5247.1

LEAST DEPTH: Date (M/D/Y) MAY 11, 94 Time (UTC) 1526
Method of Least Depth: PNEUMO
Measured Least Depth: 1.61.1 2.61.2 3.61.2 Avg. 61.2 Units FT
Uncorrected Depth 18.6 (meters) 17.6^{TLR}
Tide Corrector -1.0 Corrected Least Depth 17.3 (meters) (57 FT)
Recorder EWB Checked By JLR

SEE ALSO SECTION N.2, PAGE 10 OF DESCRIPTIVE REPORT FOR CHARTING RECOMMENDATIONS.

SURVEY H-10537

Item Number N/A

Danger to Nav. Letter Issued (Y/N) N

Charted (Y/N) N

Chart No. (largest scale) 17304 Edition 34th Date OCT 24, 92

DESCRIPTION/SOURCE: H-10537

HISTORICAL POSITION: Latitude _____ SSS POSITION: Lat _____
 Longitude _____ 15.53P Long _____
 Datum _____ Easting 6727
 Northing 6851

SURVEY REQUIREMENTS:

METHOD OF INVESTIGATION: _____ DRIFF
 Echosounder Side Scan _____ Diver Other (specify) D.P.

DIVE DATA: Divers Parvett/Riley N/A
 Time of Dive: Commenced _____ Completed _____
 Current _____ Visibility _____ Bottom Type _____

RESULTS OF INVESTIGATION:

RAN 1-M SPACED ECHOSOUNDER LINES CENTERED OVER SSS POSITION
 RLs: 1767, 1766, 1765, 1764 (SEE ECHOSOUNDER)
 LOW FREQ. HITS ON RL 1767 AND 1766 AND 1764
 LOW & HIGHT FREQ HITS ON RL 1765 - OBJECT \approx 1M HIGH (DP 3484).

POSITION: Date (M/D/Y) 11 MAY 94 Time (UTC) 164248 Position No. 3484
 Latitude 38°58'42.177"N Longitude 75°12'00.342"W
 LORAN-C: GRI () W: _____ X: _____ Y: _____ Z: _____

LEAST DEPTH: Date (M/D/Y) 11 MAY 94 Time (UTC) 164248
 Method of Least Depth: DSF-6000N ECHOSOUNDAL
 Measured Least Depth: 1. 17.5 2. 17.5 3. _____ Avg. 17.5 Units M
~~Uncorrected Depth~~ 17.5 (meters)
 Tide Corrector -0.6 Corrected Least Depth 17.3 (meters)
DRAFT: +0.6, SOUNDING: -0.2 (56. FT)

Recorder JWC Checked By MC
 SEE ALSO SECTION N.3., PAGES 10-11 OF THE DESCRIPTIVE
 REPORT FOR CHARTING RECOMMENDATION.

SURVEY H-10537 Sheet N (14)
 Item Number N/A Danger to Nav. Letter Issued (Y/N) N
 Charted (Y/N) N
 Chart No. (largest scale) 12304 Edition 34th Date OCT 24, 92

DESCRIPTION/SOURCE: H-10537

HISTORICAL POSITION: Latitude _____ Longitude _____ Datum _____
SSS POSITION: Lat _____ Long _____ Easting 6445 Northing 7128

SURVEY REQUIREMENTS:

METHOD OF INVESTIGATION:
 Echosounder Side Scan _____ Diver _____ Other (specify) DRIFT DP

DIVE DATA: Divers N/A
 Time of Dive: Commenced _____ Completed _____
 Current _____ Visibility _____ Bottom Type _____

RESULTS OF INVESTIGATION:

RAN 1-m SPACED ECHOSOUNDER LINES CENTERED OVER SSS POSITION
 RLs: 1662, 1661, 1660, 1659
 LOW & HIGH FREQ HITS ON RLs 1662, 1661, AND 1660 (SEE ECHOSOUNDER)
 LOW FREQ. HIT ON RL 1659
 LD TAKEN AS RL 1660, DP 3500: \approx 0.8 m HIGH

POSITION: Date (M/D/Y) 1994 MAY 11 (131) Time (UTC) 173441 Position No. 3500
 Latitude 38° 58' 51.129" N Longitude 75° 12' 11.985" W
 LORAN-C: GRI () W: _____ X: _____ Y: _____ Z: _____

LEAST DEPTH: Date (M/D/Y) 1994 MAY 11 (131) Time (UTC) 173441
 Method of Least Depth: DSF-6000N ECHOSOUNDER
 Measured Least Depth: 1. 17.2 2. _____ 3. _____ Avg. 17.2 Units M
~~Uncorrected~~ Depth 17.2 (meters)
 Tide Corrector -0.46 Corrected Least Depth 17.3' (meters)
 DRAFT: +0.6, SOUND VEL: -0.1 (56 FT)
 Recorder JWR Checked By MC

SEE ALSO SECTION N.4., PAGE 11 OF THE DESCRIPTIVE REPORT FOR CHARTING RECOMMENDATION.

C/K = 277



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of NOAA Corps Operations
NOAA Ship WHITING S-329
439 W. York Street
Norfolk, VA 23510-1114

June 13, 1994

Commander, Fifth Coast Guard District
Attention: OAN
431 Crawford Street
Portsmouth, VA 23704

Dear Sir:

While conducting hydrographic survey operations in the Big Stone Anchorage Area in Delaware Bay, four uncharted obstructions were discovered and one charted 'PA Wreckage' was positioned. Additionally, one "Shoal rep 1983" was investigated. Attached are reports on these features and a chartlet indicating their locations. The following table is a summary of our findings:

Feature	Latitude	Longitude	Depth (ft)
Obstruction	38°58'42.177"N	075°12'00.342"W	56 ¹
Obstruction	38°58'51.129"N	075°12'11.985"W	56 ¹
Obstruction	38°57'47.679"N	075°11'22.911"W	57 ³
Obstruction	38°57'39.316"N	075°10'52.909"W	63 ⁴
Visible Wreck	39°00'08.503"N	075°12'16.100"W	Visible ⁵
Shoal	39°01'16.801"N	075°13'45.402"W	30 ⁶

Differential GPS was used to determine the items' positions. Positions are referenced to NAD-83. All depths are referenced to MLLW using predicted tides. Chart 12304 (35th Ed. Jan 1, 1994) is the largest scale chart affected.

A copy of this letter and attachments have been forwarded to the following offices:

Chief, Nautical Charting Division, NOAA
Director, Operations Division, NOAA
Director, Defense Mapping Agency
Hydrographic/Topographic Center

Sincerely,

John D. Wilder
Commander, NOAA
Commanding Officer

Attachments
cc: AMC1
N/CG2
N/CG244
DMAHTC



REPORT OF UNCHARTED SUBMERGED FEATURE

Hydrographic Survey Registry Number: H-10537

State: Delaware

General Locality: Approaches to Delaware Bay, DE

Sublocality: 2 NM South of The Lower Middle, Delaware Bay, DE

Project Number: OPR-D368-WH-94

The following item was found during hydrographic survey operations by the NOAA Ship WHITING:

Object Discovered:

A small obstruction was found with side scan sonar (SSS). One-meter spaced echosounder lines were run centered over the SSS position.

Covers:

An echosounder least depth of 17.3 meters (56 feet), corrected to MLLW with predicted tide correctors, was discovered. The average water depth immediately surrounding the area was 18.0 meters.

Affected Nautical Charts:

<u>Chart Number</u>	<u>Edition No.</u>	<u>Date</u>	<u>Reported Depth</u>	<u>Chart Datum</u>	<u>Geographic Location</u>	
					<u>Latitude</u>	<u>Longitude</u>
12304	35	1/1/94	56 ft	NAD83	38°58'42.177"N	075°12'00.342"W

Questions concerning this report should be directed to the Atlantic Hydrographic Section in Norfolk, Virginia, at telephone number (804) 441-6746.

REPORT OF UNCHARTED SUBMERGED FEATURE

Hydrographic Survey Registry Number: H-10537

State: Delaware

General Locality: Approaches to Delaware Bay, DE

Sublocality: 2 NM South of The Lower Middle, Delaware Bay, DE

Project Number: OPR-D368-WH-94

The following item was found during hydrographic survey operations by the NOAA Ship WHITING:

Object Discovered:

A small obstruction was found with side scan sonar (SSS). One-meter spaced echosounder lines were run centered over the SSS position.

Covers:

An echosounder least depth of 17.3 meters (56 feet), corrected to MLLW with predicted tide correctors, was discovered. The average water depth immediately surrounding the area was 17.5 meters.

Affected Nautical Charts:

<u>Chart Number</u>	<u>Edition No.</u>	<u>Date</u>	<u>Reported Depth</u>	<u>Chart Datum</u>	<u>Geographic Location</u>	
					<u>Latitude</u>	<u>Longitude</u>
12304	35	1/1/94	56 ft	NAD83	38°58'51.129"N	075°12'11.985"W

Questions concerning this report should be directed to the Atlantic Hydrographic Section in Norfolk, Virginia, at telephone number (804) 441-6746.

REPORT OF UNCHARTED SUBMERGED FEATURE

Hydrographic Survey Registry Number: H-10537

State: Delaware

General Locality: Approaches to Delaware Bay, DE

Sublocality: 2 NM South of The Lower Middle, Delaware Bay, DE

Project Number: OPR-D368-WH-94

The following item was found during hydrographic survey operations by the NOAA Ship WHITING:

Object Discovered:

An uncharted concrete block measuring approximately 8 feet long, 4 feet wide and 3 feet high was found using side scan sonar.

Covers:

Divers used a pneumatic depth gauge to determine the least depth. Their findings indicate a least depth of 17.6 meters (57 feet) corrected to MLLW with predicted tide correctors. The average water depth immediately surrounding the area was 18.5 meters.

Affected Nautical Charts:

<u>Chart Number</u>	<u>Edition No.</u>	<u>Date</u>	<u>Reported Depth</u>	<u>Chart Datum</u>	<u>Geographic Location</u>	
					<u>Latitude</u>	<u>Longitude</u>
12304	35	1/1/94	57 ft	NAD83	38°57'47.679"N	075°11'22.911"W

Questions concerning this report should be directed to the Atlantic Hydrographic Section in Norfolk, Virginia, at telephone number (804) 441-6746.

REPORT OF UNCHARTED SUBMERGED FEATURE

Hydrographic Survey Registry Number: H-10537

State: Delaware

General Locality: Approaches to Delaware Bay, DE

Sublocality: 2 NM South of The Lower Middle, Delaware Bay, DE

Project Number: OPR-D368-WH-94

The following item was found during hydrographic survey operations by the NOAA Ship WHITING:

Object Discovered:

An uncharted concrete block measuring approximately 4 feet long, 3 feet wide and 3 feet high was found using side scan sonar.

Covers:

Divers used a pneumatic depth gauge to determine the least depth. Their findings indicate a least depth of 19.5 meters (63 feet) corrected to MLLW with predicted tide correctors. The average water depth immediately surrounding the area was 20.2 meters.

Affected Nautical Charts:

<u>Chart Number</u>	<u>Edition No.</u>	<u>Date</u>	<u>Reported Depth</u>	<u>Chart Datum</u>	<u>Geographic Location</u>	
					<u>Latitude</u>	<u>Longitude</u>
12304	35	1/1/94	63 ft	NAD83	38°57'39.316"N	075°10'52.909"W

Questions concerning this report should be directed to the Atlantic Hydrographic Section in Norfolk, Virginia, at telephone number (804) 441-6746.

REPORT OF UNCHARTED SUBMERGED FEATURE

Hydrographic Survey Registry Number: H-10537

State: Delaware

General Locality: Approaches to Delaware Bay, DE

Sublocality: 2 NM South of The Lower Middle, Delaware Bay, DE

Project Number: OPR-D368-WH-94

The following item was found during hydrographic survey operations by the NOAA Ship WHITING:

Object Discovered:

A wreck with a pipe-like portion of its superstructure extending approximately 4 feet above the level of the predicted chart datum.

Covers:

WHITING hydrographers estimated the height of the superstructure to be 4 feet, corrected to MLLW with predicted tide correctors.

Affected Nautical Charts:

<u>Chart Number</u>	<u>Edition No.</u>	<u>Date</u>	<u>Reported Depth</u>	<u>Chart Datum</u>	<u>Geographic Location</u>	
					<u>Latitude</u>	<u>Longitude</u>
12304	35	1/1/94	Visible	NAD83	39°00'08.503"N	075°12'16.100"W

Questions concerning this report should be directed to the Atlantic Hydrographic Section in Norfolk, Virginia, at telephone number (804) 441-6746.

REPORT OF UNCHARTED SUBMERGED FEATURE

Hydrographic Survey Registry Number: H-10537

State: Delaware

General Locality: Approaches to Delaware Bay, DE

Sublocality: 2 NM South of The Lower Middle, Delaware Bay, DE

Project Number: OPR-D368-WH-94

The following item was found during hydrographic survey operations by the NOAA Ship WHITING:

Object Discovered:

A shoal was located in the extreme northern corner of the Big Stone Anchorage Area, in the vicinity of the charted "Shoal rep 1983".

Covers:

A least depth of 9.3 meters (30.5 feet), adjusted for predicted tides, was located during survey H-10537 at 39°01'16.801"N, 075°13'45.402"W.

Affected Nautical Charts:

<u>Chart Number</u>	<u>Edition No.</u>	<u>Date</u>	<u>Reported Depth</u>	<u>Chart Datum</u>	<u>Geographic Location</u>	
					<u>Latitude</u>	<u>Longitude</u>
12304	35	1/1/94	30 ft	NAD83	39°01'16.801"N	075°13'45.402"W

Questions concerning this report should be directed to the Atlantic Hydrographic Section in Norfolk, Virginia, at telephone number (804) 441-6746.

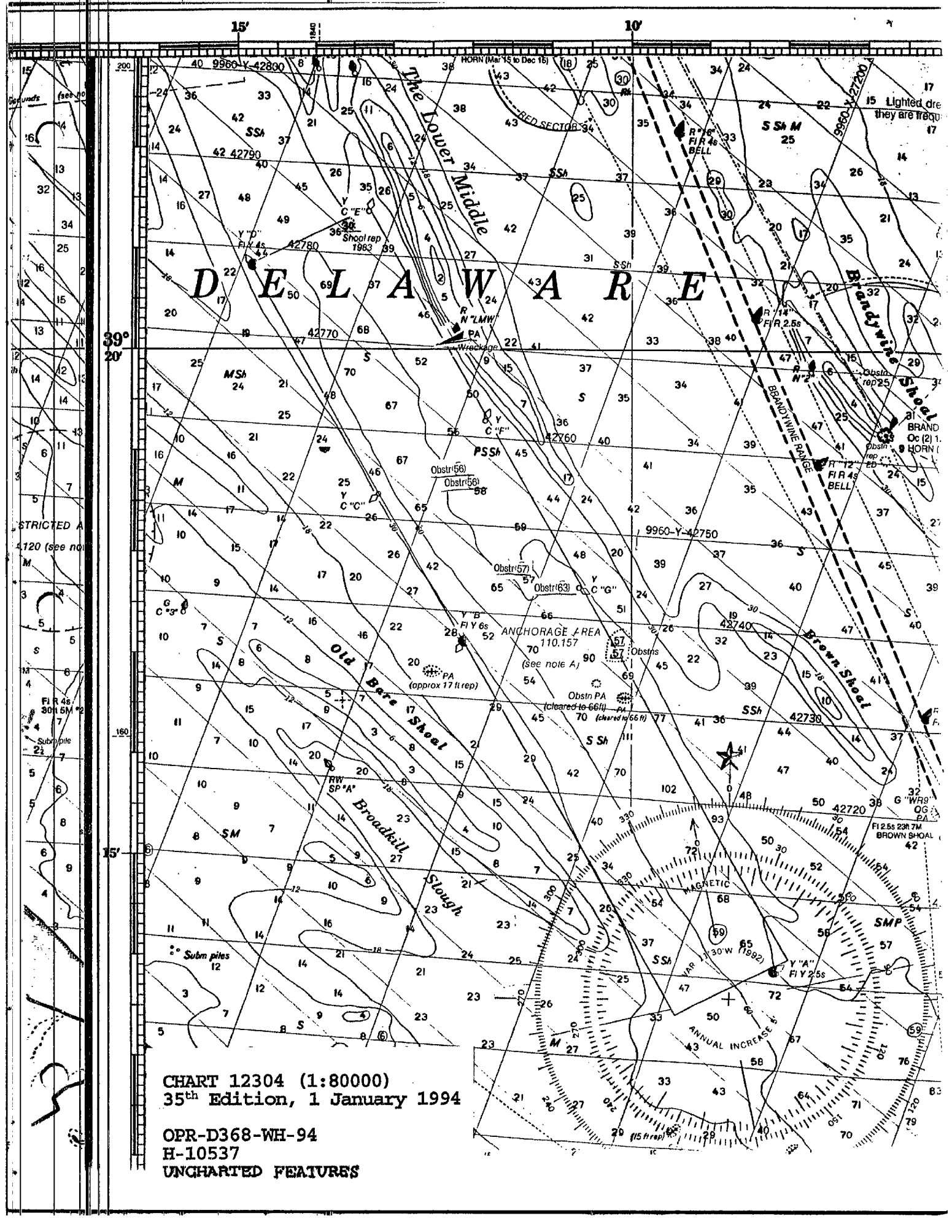


CHART 12304 (1:80000)
35th Edition, 1 January 1994

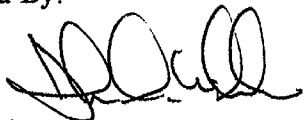
OPR-D368-WH-94
H-10537

UNCHARTED FEATURES

**APPROVAL SHEET
HYDROGRAPHIC SURVEY
OPR-D368-WH-94
1994
WH-10-4-94
H-10537**

The data for this survey were acquired and checked under my daily supervision. Position and sounding accuracy meet the requirements specified in the Field Project Instructions, Hydrographic Manual, Hydrographic Survey Guidelines and the Field Procedures Manual for Hydrographic Surveying. This survey is complete and adequate for the intended purpose of delineating bottom topography, determining depths and identifying all potential dangers to navigation. No final field sheets were prepared for this survey. The survey data and accompanying records are complete for the preparation of the smooth sheet.

Approved By:



Commander John D. Wilder, NOAA
Commanding Officer, NOAA Ship WHITING



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: November 21, 1994

MARINE CENTER: Atlantic

HYDROGRAPHIC PROJECT: OPR-D368-WH

HYDROGRAPHIC SHEET: H-10533

LOCALITY: Approaches to Delaware Bay

TIME PERIOD: April 6 - 25, 1994

TIDE STATION USED: 855-7380 Lewes (Ft. Miles), Breakwater Harbor,
Delaware Lat. $38^{\circ} 46.9'N$ Lon. $75^{\circ} 07.2'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 2.51 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.3 ft.

REMARKS: RECOMMENDED ZONING

Apply a -1 hr 00 min time correction and a x0.94 range ratio
to heights using Lewes Breakwater Harbor, Delaware (855-7380).

Note: Times are tabulated in Eastern Standard Time.

William M. Fisher

CHIEF, DATUMS SECTION



GEOGRAPHIC NAMES

H-10537

Name on Survey	A ON CHART NO. 12304 B ON PREVIOUS SURVEY NO. C ON U.S. QUADRANGLE MAPS D FROM LOCAL INFORMATION E ON LOCAL MAPS F P.O. GUIDE OR MAP G RAND McNALLY ATLAS H U.S. LIGHT LIST K											
	DELAWARE (title)	X										
DELAWARE BAY	X											2
LOWER MIDDLE, THE	X											3
												4
												5
												6
												7
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Approved:

Charles E. Harrington
Chief Geographer - N/CG2x5

OCT 14 1994

07/19/95

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H-10537

NUMBER OF CONTROL STATIONS	2
NUMBER OF POSITIONS	1100
NUMBER OF SOUNDINGS	6544

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	45	08/26/94
VERIFICATION OF FIELD DATA	64	10/26/94
QUALITY CONTROL CHECKS	22	
EVALUATION AND ANALYSIS	38	
FINAL INSPECTION	4	12/09/94
COMPILATION	11	06/16/95
TOTAL TIME	184	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		07/06/95

ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H-10537 (1994)

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

H. CONTROL

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 NAD 83 and the North American Datum of 1927 (NAD 27).

To place this survey on the NAD 27, move the projection lines 0.405 seconds (12.49 meters or 1.25 mm at the scale of the survey) north in latitude, and 1.327 seconds (31.95 meters or 3.20 mm at the scale of the survey) east in longitude.

M. COMPARISON WITH PRIOR SURVEYS

Wire Drag

H-9172WD (1970) 1:20,000

Comparison between the present survey and H-9172WD (1970) reveals three hangs and twenty-two groundings within the common area. All hangs and groundings are considered verified or disproved by the present survey. No change in charting status is recommended.

There are no conflicts between the prior survey effective clearance depths and the present survey depths.

O. COMPARISON WITH CHART 12304 (35th Edition, Jan 1/94)

The charted hydrography originates with the previously discussed prior survey and requires no further consideration. The hydrographer makes adequate chart comparisons in sections N. and O. of the Descriptive Report.

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

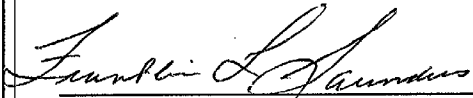
P. ADEQUACY OF SURVEY

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

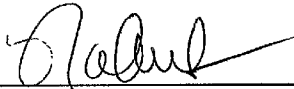
S. MISCELLANEOUS

S.3. Chart compilation has been done by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compiled data will be forwarded to Marine Chart Division upon completion of survey.

WHITING Processing Team



Franklin L. Saunders
Cartographic Technician

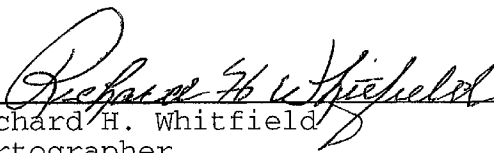


Norris A. Wike
Cartographer

APPROVAL SHEET
H-10537


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. A final sounding printout of the survey has been made. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.


Richard H. Whitfield
Cartographer
Atlantic Hydrographic Branch

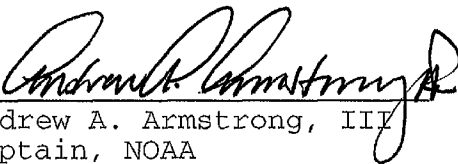
Date: July 6, 1995

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, CDR, NOAA
Chief, Atlantic Hydrographic Branch

Date: July 6, 1995

Final Approval:

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

Date: Aug 15, 1995

