

H10234

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. **WH-10-2-94**
Registry No. **H-10234**

LOCALITY

State **DELAWARE**
General Locality **DELAWARE BAY**
Sublocality **2.5 NM SOUTHWEST OF
BROWN SHOAL**

19 94

CHIEF OF PARTY

..... **CDR J. D. WILDER, NOAA**

LIBRARY & ARCHIVES

DATE **AUG 8 1995**

Diagram 1218-3

NATIONAL BUREAU OF STANDARDS
 U.S. DEPARTMENT OF COMMERCE

DESCRIPTION

Registry No.	
Field No.	
Type of Survey	
State	
General Locality	
Sublocality	
Section - Block	
Sheet of Plan	
Library & Archives	
Date	

43307H

Products
 - CP3
 - 12214
 - 12304
 12200 n/c

NOAA FORM 77-28
(11-72)

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

REGISTER NOS.

H-10234

HYDROGRAPHIC TITLE SHEET

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-10-2-94

State DELAWARE

General locality DELAWARE BAY

Locality 2.5 NAUTICAL MILES SOUTHWEST OF BROWN SHOAL

Scale 1:10,000 Date of Survey 10 APRIL - ~~11 MAY 1994~~ ^{12 SEP 94}

Instructions dated FEBRUARY 23, 1993 Project No. OPR-D368-WH

Vessel NOAA SHIP WHITING S-329 EDP#2930

Chief of Party CDR JOHN D. WILDER

Surveyed by CDR. J.D. WILDER, LCDR S.R. BARNUM, LT J.S. VERLAQUE, LT W.G. KITT, LTJG J.L. RILEY, LTJG E.W. BERKOWITZ, ENS K. PAVELLE, F.R. CRUZ, J. GASKIN, 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 DATUM AND DEPTHS IN UNITS OF METERS

REMARKS: TIME ZONE USED, 0 (UTC)

100% SIDE SCAN COVERAGE, BIG STONE ANCHORAGE

100% SIDE SCAN COVERAGE, AWOIS 8401

200% SIDE SCAN COVERAGE, REMAINING AREA

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

AWOIS/SURP ✓ 8/28/95 SSJ

SC 3/25/97 AUG 8 1995

74/40 W

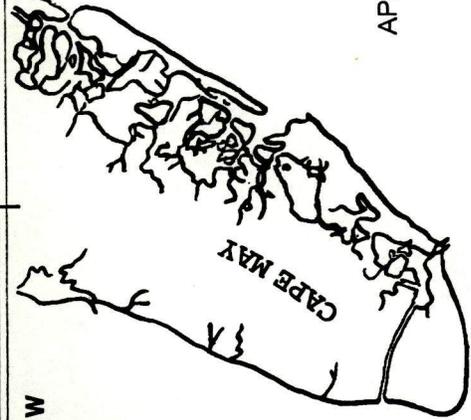
75/00 W

39/00 W

38/40 W

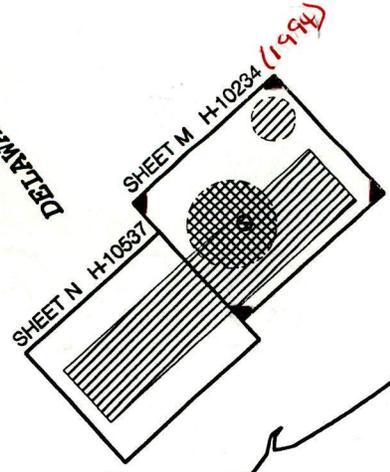
NOAA SHIP WHITING
 JOHN D. WILDER, CDR
 OPR-D368-WH-94
 HYDROGRAPHIC SURVEY
 APPROACHES TO DELAWARE BAY
 APRIL-MAY 1994

ATLANTIC OCEAN

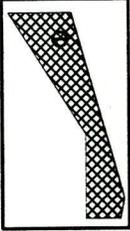


DELAWARE BAY

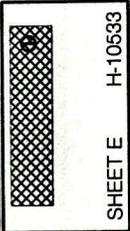
CAPE HENRI OPEN



SHEET L H-10241



SHEET E H-10533



	APRIL	MAY
SQ NM SOUNDINGS	0	4
LN M SOUNDINGS	52	125
SQ NM SIDE SCAN SONAR	22	9
LN M 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
 LN M SOUNDINGS
 SQ NM SIDE SCAN SONAR
 LN M 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-10-2-94
H-10234**

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

A. PROJECT

Project OPR-D368-WH-94 is a basic hydrographic survey with side scan sonar (SSS) bottom coverage.

The purpose of this project is to update the existing nautical charts and to locate any wrecks and obstructions in or near the approaches to Delaware Bay and inside Delaware Bay. Specifically, this project is in response to a request by the Delaware Bay and River Pilots Association to have four items located in the anchorage just southwest of Brandywine Channel investigated. The anchorage is locally known as Big Stone Anchorage. The items are in the AWOIS listing dated July 21, 1993.

In addition to investigating the four items, a basic survey was conducted in the southern half of the anchorage with 100-percent SSS coverage. An additional AWOIS item located near the mouth of Brandywine Channel was investigated.

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
CHANGE NO. 5	JUNE 3, 1994
CHANGE NO. 6	SEP 7, 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).

Project OPR-D368-WH consists of ten survey sheets. The survey described in this report was designated as sheet 'M'. This survey was assigned field sheet number WH-10-2-94 and registry number H-10234.

B. AREA SURVEYED

Hydrographic survey H-10234 is 2.5 nautical miles southwest of Brown Shoal. The survey covers the southern section of the Big Stone anchorage, the 3000-meter search radius for AWOIS 1211 and the 1000-meter search radius for AWOIS 8401. The search radius of AWOIS 1211 covers most of the northern section, and extends beyond the eastern boundary of the anchorage. AWOIS 1211 was investigated with 200% SSS bottom coverage. The remaining area of the anchorage not covered by the search radius for AWOIS 1211 was surveyed with 100% SSS bottom coverage and 75-meter echosounding line spacing. The search radius for AWOIS 8401 was surveyed with 100% SSS bottom coverage (see section N.). The survey of the anchorage is bounded by the following approximate limits:

NW	38° 57.1' N, 075° 12.2' W	NE	38° 57.8' N, 075° 10.8' W
SW	38° 53.4' N, 075° 09.4' W	SE	38° 54.0' N, 075° 07.9' W

Survey operations began on April 10, 1994 (DN 100) and ended on May 11, 1994 (DN 131). Survey operations resumed on September 11, 1994 (DN 254) and concluded on September 12, 1994 (DN 255).

C. SURVEY VESSELS

NOAA Ship WHITING (VESNO 2930), launch 1014 and 1015 (VESNO 2932 and 2931, respectively) were used for SSS and sounding data acquisition while surveying these areas. Both launches were used as dive platforms for least depth determination and for acquiring a position on items investigated. Launch 1015 was also used to obtain bottom samples, velocity casts, and 400% side scan sonar (SSS) coverage in certain AWOIS search radii.

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

SHIPDIM version 1.2 was used for DGPS performance checks. Sound velocity corrections were determined using *CAT* version 2.00 and *VELOCITY* versions 2.00 and 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 were used throughout the survey:

<u>VESNO</u>	<u>Type</u>	<u>S/N</u>	<u>DN</u>	<u>Fix Numbers</u>
2930	Towfish	16699	100-126	6000-6925
2930	Recorder	16670	100-126	6000-6925
2931	Towfish	11908	101-104	0001-0165
2931	Towfish	16835	128-130	0331-0617
2931	Recorder	16671	101-104	0001-0165
2931	Recorder	16942	128-130	0331-0617
2932	Towfish	16699	130-131	3011-3124
2932	Recorder	16671	130-131	3011-3124
2932	Towfish	16630	254	8000-8069
2932	Recorder	16942	254	8000-8069

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. SSS operations were limited to a speed of 6 knots or slower.

Confidence checks were performed on a routine basis, primarily by noting changes in bottom texture on the outer edges of the sonagram. Confidence checks were also taken on buoys or wrecks when convenient.

All potentially significant contacts were measured off the sonagram and entered into an HDAPS contact table. Using the contact utility program WHITING hydrographers determined contact heights, positions and correlations to one another. Significant items or items within AWOIS item search radii were then further developed by diver investigation. Refer to Section N and to Separate V for more information. DATA APPENDED TO THIS REPORT.

F. SOUNDING EQUIPMENT

A Raytheon Digital Survey Fathometer (DSF 6000N) echo sounder was used to measure water depths during the survey. The DSF-6000N produced a graphic record of the high frequency (100 kHz) and low frequency (24 kHz) depth. The high and low frequency digital depths were recorded by the HDAPS acquisition system. The high frequency depths were selected as the primary depths as shown on the sounding plots. In addition, echograms were carefully reviewed for significant features along the track line. The low frequency analog trace was 0.1 to 0.2-meters shoaler than the high frequency trace in some areas of the survey. WHITING hydrographers did not insert these low frequency. The difference appeared to be the result of unconsolidated sediment or "fluff". Any features on the graphic record that were not selected as primary soundings were manually selected.

Electronic technicians performed daily accuracy checks and preventive maintenance on the DSF-6000N. As a result, the echosounders on WHITING (S/N A106N), launch 1014 (S/N C076, A112N) and launch 1015 (S/N A105N) operated throughout the survey without any major problems.

Diver-determined least depths were measured with a Diver Least Depth Gauge Module (MOD 3, S/N 0001) and a pneumatic depth gauge (S/N 138921 30). The MOD 3 Gauge was used in accordance with the documentation sent by the Nautical Charting Research and Development Laboratory on September 9, 1993. The MOD 3 gauge was calibrated after the 1993 field season; a pre-calibration report was made in March, 1994, prior to its use for this survey. Pneumatic gauge 138921 30 was calibrated on September 21, 1993. The MOD 3 gauge was lost at sea during dive operations on DN 113. Consequently, the pneumatic depth gauge was used on two dives conducted on DN 130, in accordance with Hydrographic Guideline No. 55.

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 profiler was calibrated on December 17, 1993, during WHITING's winter inport period. A copy of the calibration report is included in Separate IV. *DATA FILED WITH FIELD RECORDS.*

After each CTD cast, programs *CAT 2.00* and *VELOCITY 2.00/2.10* were used to process the data, select significant data points, and create a corrector table. The velocity correctors were manually entered into an HDAPS velocity table. The correctors were applied to both high and low frequency beams during acquisition. Velocity profile data are in the Separates submitted with this survey. *DATA FILED WITH FIELD RECORDS.*

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.

Four velocity casts were performed as described below:

<u>DN</u>	<u>Cast #</u>	<u>Vel. Table#</u>	<u>Latitude</u>	<u>Longitude</u>
101	2	3, 4	38° 56' 32"N	075° 10' 13"W
104	5	9, 10	38° 53' 54"N	075° 11' 30"W
123	10	19, 20	38° 56' 06"N	075° 10' 54"W
125	11	21, 22	38° 56' 09"N	075° 09' 40"W
254	12	46	38° 55' 37"N	075° 03' 36"W

There were no variations in instrument initials.

Bar checks were performed weekly on launches 1014 and 1015 as per the requirements stated in the Field Procedures Manual. No deficiencies were noted.

New leadlines were made on April 10, 1993, and calibrations performed on March 17, 1994, confirmed the leadline error was negligible. A leadline comparison with the ship's DSF-6000N was performed on May 11, 1994 (DN 131). On the average, the leadline reading was

less than 0.1 meters deeper than the high frequency digitized reading and less than 0.2 meters shallower than the low frequency digitized reading. No corrections for the differences were applied to the survey data.

The correction for the static draft of launches 1014 and 1015 is 0.55 meters. These values were determined 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 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 measurements for launches 1014 and 1015 were conducted and correctors determined on April 4, 1994. The correctors were entered in Offset Table 2 (launch 1014) and Offset Table 1 (launch 1015) and reapplied to all data collected by the launches. Settlement and squat correctors are in Separate IV. *DATA FILED WITH FIELD RECORDS.*

For data acquired by WHITING, the HDAPS data acquisition computer logged, in real-time, heave data from a heave, roll, and pitch sensor (HIPPI, S/N 19109-C). Heave correctors were applied in post-processing. Echograms from both launches were manually scanned for heave action.

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

Predicted 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 as control while on-line; the Cape Henry beacon 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 similar systems, but were equipped 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. When the beacon signal was lost for more than 30 seconds (1:10,000 scale), the survey line was broken and the line was rerun where control had been unacceptable. Horizontal Dilution of Precision (HDOP) limits were computed as required in section 3.4.2 of the FPM. Based on a maximum distance from the differential beacon of 50 miles, the HDOP limit for this 1:10,000-scale survey using the Cape Henlopen beacon is 3.6. When high HDOP caused position flyers, those positions were either smoothed or rejected and the line rerun.

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	700417B11191
CSI MBX1	1080

Performance checks for WHITING were conducted using the program *SHIPDIM*. *SHIPDIM* uses the two reference station method as described in 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 the launches housed securely in WHITING's davits by comparing simultaneous HDAPS positions for the launches and the ship. An offset in distance and azimuth was then calculated between the two systems. Checks were conducted on a weekly basis and 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 both launches. Offsets and laybacks were measured using the 100 kHz (high frequency) echo-sounder transducer as the reference. Antenna heights were measured on the same date. Offsets and laybacks were applied by HDAPS on-line. All offset, layback and height data are included in the Separates.*

Offsets and laybacks for the WHITING A-frame used to tow the SSS towfish 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.*

Offset and layback corrections for the launches side scan winches 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 13.7 nautical miles of crosslines were run during survey H-10533²³⁴, or 10% of the total linear nautical miles of main-scheme lines needed for 100 percent SSS coverage of the

*DATA FILED WITH FIELD RECORDS.

anchorage. Crossline and main-scheme agreement, with predicted tides applied, was adequate. Most soundings agreed to within 0.2 meters with no errors greater than 0.4 meters.

L. JUNCTIONS SEE ALSO EVALUATION REPORT.

The current survey H-10537 lies to the northwest of H-10234. Comparison with H-10234 and H-10537 showed very good agreement between survey junctions. Soundings from each survey were within 0.2 meters.

M. COMPARISONS WITH PRIOR SURVEYS SEE ALSO EVALUATION REPORT.

Three prior surveys were compared to soundings from this survey. The following table summarizes the sounding comparisons:

<u>Registry #</u>	<u>Scale</u>	<u>Year</u>	<u>Current Soundings</u>
H-9202	1:20,000	1971	No significant difference
H-9758WD	1:20,000	1976	No significant difference
H-9172WD	1:20,000	1970	No significant difference

The majority of comparisons agreed to within 0.1 meters.

All three surveys were referenced to the NAD-27 horizontal datum. A 1:20,000-scale sounding plot of H-10234 was drawn up by WHITING. Soundings were excessed and plotted in feet using the NAD-83 horizontal datum. The datum shift was calculated for the center of the survey area and marked on the sounding plot. WHITING used this mark and shifted the sounding plot to make comparisons.

As depicted on the prior sounding survey, the bottom in the area is generally smooth. Areas of sandwaves were located in the southeastern section of the anchorage and the eastern section of the search radius for AWOIS 1211. Comparisons between contours from H-9202 and H-10234 showed no significant variations in contour position or extent.

N. ITEM INVESTIGATIONS

Summary of items investigated:

<u>SECTION</u>	<u>NAME</u>	<u>STATUS</u>
N.1	141.31S	Diver investigation
N.2	AWOIS 1223	Disproved
N.3	AWOIS 1224	Disproved
N.4	AWOIS 1217	Disproved

<u>SECTION</u>	<u>NAME</u>	<u>STATUS</u>
N.5	AWOIS 1211	Verified, diver least depth acquired
N.6	6041.11S	Diver investigation
N.7	8056.30S	Diver investigation
N.8	8059.21P	Diver investigation
N.9	AWOIS 8401	Verified, diver least depth acquired

N.1 141.31S

AWOIS 8401

Reported Latitude: 38° 55' 24.40" N
 Reported Longitude: 075° 06' 07.65" W
 Source: OPR-480-RU/HE-70
 Charted Depth: Unknown
 Datum: NAD ~~2783~~
 Feature: Dangerous Wreck Position Approximate

Survey requirements are 200% side scan sonar coverage over a 1000-meter radius, diver investigation, and/or salvage documentation.

Four correlated contacts showing two separate items were found within the search radius during 100% SSS coverage: 141.31S, 3051.44S and 141.38S, 3052.02S. Echosounding was used to pinpoint drop positions for WHITING divers. Divers descended each item and discovered metal obstructions covered with marine growth at both sites. The two items are approximately 87-meters (285-feet) apart, bearing 294° - 114° T. Divers were unable to describe any distinguishable shape or form at either site.

A ³12.4-meter least depth (^{APPROVED} predicted tides) was measured on the southern most item (Contacts 141.31S, 3051.44S) using the pneumogauge (DP #3062, DN 130). On the northern most item (Contacts 141.38S, 3052.02S), a ¹²11.8-meter least depth (^{APPROVED} predicted tides) was measured with the pneumogauge (DP #3063, DN 130). ^{APPROVED} IT IS RECOMMENDED THAT AN OBSTRUCTION WITH

A KNOWN DEPTH OF 12' (39FT), AND A DANGER CURVE BE CHARTED IN LATITUDE 38° 55' 08.05"N, LONGITUDE 75° 06' 03.07"W, AND AN OBSTRUCTION WITH A KNOWN DEPTH OF 12' (40FT), AND A DANGER CURVE, BE CHARTED IN LATITUDE 38° 55' 05.46"N, LONGITUDE 75° 06' 01.66"W.

N.2 AWOIS 1223 (123m) 400obstr NOT SHOWN ON CHARTS 12214 AND 12304 DUE TO CHART CONGESTION.

Reported Latitude: 38° 57' 02.20" N
 Reported Longitude: 075° 10' 10.66" W
 Source: OPR-515-RU/HE-76
 Charted Depth: Wire drag cleared to 57 feet
 Datum: NAD ~~2783~~
 Feature: Obstruction

Survey requirements are 400% SSS coverage over a 100-meter radius, diver investigation,

and/or salvage documentation.

The area was covered with 400% SSS coverage. No significant contacts were found. WHITING recommends AWOIS 1223 be removed from the database, and the obstruction be deleted from the chart. *CONCUR*

N.3 AWOIS 1224

Reported Latitude:	38° 57' 09.40" N
Reported Longitude:	075° 10' 10.66" W
Source:	OPR-515-RU/HE-76
Charted Depth:	Wire drag cleared to 57 feet
Datum:	NAD 27 83
Feature:	Obstruction

Survey requirements are 400% SSS coverage over a 100-meter radius, diver investigation, and/or salvage documentation.

The area was covered with 400% SSS . No significant contacts were found. WHITING recommends AWOIS 1224 be removed from the database, and the obstruction be deleted from the chart. *CONCUR*

N.4 AWOIS 1217

Reported Latitude:	38° 56' 42.40" N
Reported Longitude:	075° 10' 28.06" W
Source:	OPR-51-RU/HE-76
Charted Depth:	Wire drag cleared to 66 feet
Datum:	NAD 27 83
Feature:	Obstruction Position Approximate

Survey requirements are 200% side scan sonar coverage over a 500-meter radius, diver investigation, and/or salvage documentation.

The area was covered with 200% SSS during main scheme lines on the present survey. No contacts were found. WHITING recommends AWOIS 1217 be removed from the AWOIS database, and the obstruction be deleted from the chart. *CONCUR*

N.5 AWOIS 1211

Reported Latitude: 38° 56' 33.40" N
Reported Longitude: 075° 10' 07.06" W
Source: OPR-515-RU/HE-76
Charted Depth: Wire drag cleared to 66 feet
Datum: NAD 27⁸³
Feature: Dangerous Wreck Position Approximate

Survey requirements are 200% side scan sonar coverage over a 2000-meter radius, diver investigation, and/or salvage documentation.

Four contacts within a 20-meter radius were found within the AWOIS search radius during 200% SSS main scheme lines on the present survey: contacts 6059.12S, 6415.09P and 6059.16S, 6415.13P. WHITING determined contacts 6059.12S and 6415.09P were the most significant item. Echosounding was used to pinpoint a drop position for WHITING divers. Divers descended on the item and discovered metal wreckage 9 to 12 meters long, 2.4 meters wide, standing 1.2 meters off the bottom. Divers conducted 10-meter circle searches at both ends of the wreckage and found no other items. A 24.6⁴-meter least depth (APPROVED predicted tides) was taken on the wreckage with the MOD 3 gauge (DP #163, DN 104). The average water depth surrounding the area was 25.9 meters (APPROVED predicted tides).

WHITING recommends the dangerous wreck charted at 38° 56' 33.40" N, 075° 10' 07.06" W be deleted from the chart. ^{NON DANGEROUS} A wreck with a least depth known, should be charted at 38° 56' 57.86" N, 075° 10' 33.50" W. ^{CONCUR} ^{24.4m (80 FT)}
58.12 ₁₅

N.6 Contact 6041.11P

Latitude: 38° 57' 03.009" N
Longitude: 075° 10' 20.994" W
Cross References: Not logged

Contact 6041.11P was found during 200% main scheme coverage within the search radius of AWOIS 1211. The contact's characteristics from side scan sonar were undetermined, warranting a diver investigation. Echosounding was used to pinpoint a drop position for WHITING divers.

Divers descended on the contact and discovered numerous small rocks approximately 0.3 meters in diameter. The surrounding water depth was 20.0 meters and the rocks were determined to be insignificant. No additional SSS, echosounder development or diver investigation is warranted. ^{CONCUR}

N.7. 8056.30S

Latitude: 38° 55' 26.920 " N
Longitude: 075° 05' 58.580" W
Cross References: 8000.56P, 8051.36P

Contact 8056.30S was found during 100% SSS coverage within a 500-meter search radius around AWOIS 8401. The contact's characteristics from SSS were undetermined, warranting a diver investigation. Echosounding was used to pinpoint a drop position for WHITING divers.

Divers located a 5 feet by 5 feet concrete anchor block standing 2 feet off the bottom. A 12.8 meter least depth (^{APPROVED} predicted tides) was taken with a pneumogauge (DP# 8069, DN 255). WHITING does not recommend this item be charted due to the close proximity of contact 8059.21P described below. *CONCLR*

N.8. 8059.21P

Latitude: 38° 55' 33.558 " N
Longitude: 075° 06' 06.430" W
Cross References: 8061.24P, 8032.53P

Contact 8059.21P was found during 100% SSS coverage within a 500-meter search radius around AWOIS 8401. The contact's characteristics from SSS were undetermined, warranting a diver investigation. Echosounding was used to pinpoint a drop position for WHITING divers.

Divers located a 4 foot diameter buoy standing upright approximately 10 feet off the bottom. An 11.0³ meter least depth (^{APPROVED} predicted tides) was taken with the pneumogauge (DP# 8068, DN 255) in 14 meters of water. WHITING recommends this item be charted as an obstruction with least depth known. *11.3m (37FT) AND A DANGER CURVE BE CHARTED IN LATITUDE 38°55'33.56"N, LONGITUDE 75°06'06.43"W. NOT SHOWN ON CHARTS 12214 AND 12304 DUE TO CHART CONGESTION.*

N.9. AWOIS 8401, Contacts 8007.05P, 8007.02P, 8047.10P

Reported Latitude: 38° 55' 24.40 " N
Reported Longitude: 075° 06' 06.65" W
Source: OPR-480-RU/HE-70
Charted Depth: Unknown
Datum: NAD 2783
Feature: Dangerous Wreck Position Approximate

Survey requirements are 200% SSS coverage over a 1000-meter radius, diver investigation, and/or salvage documentation.

Contacts 8007.05P, 8007.02P and 8047.10P were found during 100% SSS coverage within a 500-meter search radius around AWOIS 8401. The contacts' characteristics from SSS were undetermined, warranting a diver investigation. Echosounding was used to pinpoint drop positions for WHITING divers.

Divers located scattered debris at each site that appear to be the remains of the sunken barge described in AWOIS 8401. Contact 8007.05P is the most significant contact. At this location, divers located metal wreckage over a 35 foot diameter. At the least depth location the debris stood 6 feet off the bottom. A 11.5 meter least depth (predicted tides) was taken with the pneumogage (DP# 8070, DN 255) in ~~12.2~~^{13.4} meters of water. WHITING recommends the dangerous wreck be charted as a wreck with least depth known at 38° 55' 24.424 " N, 075° 06' 00.727" W. 11.5m (37 FT) AND A DANGER CURVE

Q. COMPARISON WITH THE CHART SEE ALSO EVALUATION REPORT.

Chart 12304 (1:80,000), 35th edition, January 1, 1994, corrected through Notice to Mariners 22/94, is the largest scale chart that covers the survey area.

Charted depths were compared to soundings acquired during the survey. In general, sounding agreement was excellent. Acquired and charted depths agreed to ± 0.3 meters.

Chart 12214 (1:80,000), 37th edition, June 27th, 1992 covers the search radius for AWOIS 8401. A discrepancy exists between chart 12304 and chart 12214 concerning how the fixed aid to navigation, Brown Shoal Light and AWOIS 8401 are charted. The following shows how each item is charted:

Chart 12304:

F1 2.5s 23ft 7M
BROWN SHOAL PA

WK PA

Chart 12214:

BROWN SHOAL
F1 2.5s 23ft 7M PA

WK

Chart 12304 implies Brown Shoal Light and the wreck have approximate positions. Chart 12214 implies only Brown Shoal Light has an approximate position. Refer to section N.1 for information on AWOIS 8401 and section Q for information on Brown Shoal Light.

No changes to the scale, coverage, or format of Chart 12304 are recommended.

P. ADEQUACY OF SURVEY *SEE ALSO EVALUATION REPORT*

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

Three floating aids are located in or near Big Stone Beach anchorage: yellow buoy 'A', yellow buoy 'B' and yellow buoy 'G'. One floating aid and one fixed aid to navigation lie within the search radius of AWOIS 8401: green buoy 'WR9' and Brown Shoal Light. 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>
2180	'A' Fl Y 2.5s	38°53.8' N, 075° 08.1' W
2185	'B' Fl Y 6s	No position listed
2210	'G' Y can	No position listed
1545	'WR9' QG	38° 55.4' N, 075° 06.0' W
1535	BROWN SHOAL LIGHT Fl W 2.5s	38° 55.3' N, 075° 06.0' W

Chart 12304 charts these aids to navigation as follows:

<u>Aid to Navigation</u>	<u>Position</u>
Y 'A' Fl Y 2.5s	38° 53.82' N, 075° 08.12' W
Y 'B' Fl Y 6s	38° 57.09' N, 075° 12.18' W
Y C 'G'	38° 57.63' N, 075° 10.70' W
G 'WR9' QG	38° 55.40' N, 075° 06.00' W
Fl 2.5s 23ft 7M BROWN SHOAL PA	38° 55.35'N, 075° 06.01' W

WHITING obtained positions on the aids to navigation listed above by maneuvering a survey launch alongside the aid and recording a DP. Time did not allow for a more accurate position of Brown Shoal Light. The following table lists the DP#/DN, position and distance from the charted position of each aid to navigation positioned by WHITING:

<u>Aid to Navigation</u>	<u>DP#/DN</u>	<u>Position</u>	<u>Distance (m)</u>
buoy 'A'	330/127	38° 53' 50.368" N 075° 08' 09.280" W	62
buoy 'B'	3000/129	38° 57' 04.845" N 075° 12' 10.867" W	17

buoy 'G'	329/127	38° 57' 39.323" N 075° 10' 41.870" W	47
buoy 'WR9'	3010/129	38° 55' 26.418" N 075° 06' 00.448" W	75
Brown Shoal Light	3009/129	38° 55' 20.762" N 075° 06' 00.609" W	7

The light characteristics for each aid to navigation are correct. All aids to navigation adequately serve the purpose for which they were established except buoy 'WR9'. Buoy 'WR9' was established to mark the dangerous wreck charted at 38° 55' 24.40" N, 075° 06' 07.65" (AWOIS 8401), see section N.1.⁹ Buoy 'WR9' is ~~495~~⁶² meters NNE of the item described in section N.1.⁹. ~~WHITING recommends this buoy repositioned.~~

R. STATISTICS

Number of Positions	1543
Main-scheme Sounding Lines (Nautical Miles)	207
Crosslines (Nautical Miles)	13.7
Square Nautical Miles Surveyed	6.2
Days of Production	15
Detached Positions	15
Bottom Samples	3
Tide Stations Installed	None
Current Stations	None
Number of CTD Casts	5
Magnetic Stations	None

S. MISCELLANEOUS *SEE ALSO EVALUATION REPORT.*

Sounding lines during this survey were run parallel to depth contours due to the orientation and narrow width of Big Stone Beach Anchorage. Running sounding lines perpendicular to the depth contours was determined to be inefficient and unsafe for the ship.

Areas of sand waves were discovered in the southeastern section of the anchorage and the eastern section of the search radius for AWOIS 1211. WHITING hydrographers scanned echograms and inserted shoal soundings within these areas as per direction of NCG/244. WHITING recommends charting these shoal soundings with the annotation "sand waves". The irregular bottom resulting from sand waves was not developed beyond 75-meter line spacing due to the existing pattern, already apparent normal to the sand waves. No additional development is needed in these areas.

No anomalies in either tide or current and/or unusual magnetic variations were encountered in the survey area. No unusual submarine features were discovered. Bottom samples were not submitted to the Smithsonian Institution.

WHITING suspended side scan operations twice daily to run the engines under full load. This time was used to service equipment or transit between survey areas.

T. RECOMMENDATIONS *SEE ALSO SECTION P. OF THE EVALUATION REPORT.*

H-10234 is complete and without inadequacies. See Section N for specific recommendations. 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:



LTJG Eric W. Berkowitz, NOAA
Junior Officer, NOAA Ship WHITING

ITEM INVESTIGATION REPORT

SURVEY FE-395

Item Number 1211 (Possibly)

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

Charted (Y/N) N

Chart No. (largest scale) _____ Edition _____ Date _____

DESCRIPTION/SOURCE: FE-395, AWD 1211

HISTORICAL POSITION: Latitude 38° 52' 33.9" N SSS POSITION: Lat 38° 56' 58.115" N
Longitude 75° 10' 07.66" W Long 75° 10' 33.135" W
Datum NAD 83 Easting 4890
Northing 12894

SURVEY REQUIREMENTS: SZ, DI, SD

6059.125

METHOD OF INVESTIGATION:

Echosounder Side Scan Diver Other (specify) _____

DIVE DATA: Divers VERLAQUE, BERLADITZ

Time of Dive: Commenced 1710 Completed 1831

Current 0.5 E Visibility 5-10' Bottom Type S.S.H.P. SILT

RESULTS OF INVESTIGATION: PI: 14.80 P_W: 51.70 P_{OUT} 15.24.

DUMPS DESCRIBED: BUOY ONTO METAL WRAPPE APPROX 30-40' IN LENGTH, 4' OFF BOTTOM; 8' WIDE. 10-M CIRCLE SEARCH ON ENDS OF WRAPPE - NOTHING FOUND.

POSITION:

Date (M/D/Y) ^{04/10/94} 4-14-94 Time (UTC) 1734 26 Position No. 4163

Latitude 038° 56' 57.804" N Longitude 075° 10' 33.504" W

LORAN-C: GRI (9760^{58.122}) W: 15846.8 X: 27204.6 Y: 92736.8 Z: 59245.8

LEAST DEPTH:

Date (M/D/Y) 4-14-94 Time (UTC) 1725 2

Method of Least Depth: M03

Measured Least Depth: 1. _____ 2. _____ 3. _____ Avg. 25.5 Units M

Uncorrected Depth 25.5 (meters)

Tide Corrector -0.9-1.1 Corrected Least Depth 24.6 (meters)

(80 FT)

Recorder JOV

Checked By EWB

SEE SECTION N.5., PAGE 12 OF THIS REPORT FOR CHARTING RECOMMENDATION.

ITEM INVESTIGATION REPORT

SURVEY FE-395 WH-10-2-94
Item Number 1217 N/A
Charted (Y/N) N
Chart No. (largest scale) _____ Edition _____ Date _____

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

DESCRIPTION/SOURCE: AA AWDIS 1217

HISTORICAL POSITION: Latitude 38° 56' 42.40"
Longitude 075° 10' 28.66"
Datum NAD 83

SSS POSITION: Lat 38° 57' 03.009"
Long 075° 10' 20.974"
Easting 5176
Northing 13048
6041.115

SURVEY REQUIREMENTS:

METHOD OF INVESTIGATION:

Echosounder Side Scan Diver Other (specify) _____

DIVE DATA: Divers VERLAQUE / BERKOWITZ

Time of Dive: Commenced 1414 Completed 1835
Current 0.5G Visibility 5-10' Bottom Type S, G, P, Silt.

RESULTS OF INVESTIGATION: PI 14.84

Diver descended buoy and conducted 20-M CIRCLE SEARCH
NO CONTACTS FOUND. NUMEROUS SMALL ROCKS FOUND 1' DIAMETER.
NOTHING ELSE FOUND.

POSITION:

Date (M/D/Y) ^{DN104} 4-14-94 Time (UTC) 1842/6 Position No. 4/65
Latitude 038° 57' 03.080" Longitude 075° 10' 21.409"
LORAN-C: GRI () W: _____ X: _____ Y: _____ Z: _____

LEAST DEPTH:

Date (M/D/Y) N/A Time (UTC) 1828
Method of Least Depth: _____
Measured Least Depth: 1. _____ 2. _____ 3. _____ Avg. _____ Units _____
Uncorrected Depth _____ (meters)
Tide Corrector _____ Corrected Least Depth _____ (meters)

Recorder EUB Checked By _____

SEE SECTION N.4., PAGE 11 OF THIS REPORT FOR CHARTING RECOMMENDATION

SURVEY H-10243

Item Number 8401-A

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

Charted (Y/N) Y

Chart No. (largest scale) 12214
12304

Edition 37TH
34

Date 27 JUNE 92

24 OCT 92

DESCRIPTION/SOURCE: LN 31/84; SUNKEN BARGE, 300 FEET LONG

HISTORICAL POSITION: Latitude 38 55 24.4
Longitude 075 06 07.65
Datum NAD 83

SSS POSITION: Lat 38 55 05.4
Long 075 06 01.6
Easting 11429
Northing 9420

SURVEY REQUIREMENTS:

METHOD OF INVESTIGATION:

Echosounder _____ Side Scan _____ Diver Other (specify) _____

DIVE DATA: Divers

Berkowitz, Quinn

Time of Dive: Commenced 1448 UTC Completed 1511

Current 2 kts Visibility 2-3 ft. Bottom Type silt, shells

RESULTS OF INVESTIGATION: Divers located

Debris, heavy growth, 15 meter radius - 1-1.5 meters tall

Item HAD NO RECOGNIZABLE FORM.

SURROUNDING WATER 13.8 METERS

POSITION:

Date (M/D/Y) 5/9/94 Time (UTC) 1645:55 Position No. 43062
Latitude 38° 55' 05.677" Longitude 075° 06' 01.676"
LORAN-C: GRI (9960) W: 15827.2 X: 271743 Y: 42711.0 Z: 59281.4

LEAST DEPTH:

Date (M/D/Y) 5/9/94 Time (UTC) 1507
Method of Least Depth: Pneumogauge
Measured Least Depth: 1. 43.1 2. 43.5 3. 43.6 Avg. 43.4 Units ft.
Uncorrected Depth 13.2 (meters)
Tide Corrector -0.8-0.9 Corrected Least Depth 12.2 (meters)
-1.0 (40 FT)

Recorder KP Checked By EWB

SEE SECTION N.L., PAGE 10 OF THIS REPORT FOR CHARTING RECOMMENDATION

SURVEY H-10243

Item Number 840178

Charted (Y/N) Y

Chart No. (largest scale) 12214
12304

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

Edition 37TH
34TH

Date 27 JUNE 92
24 OCT 92

DESCRIPTION/SOURCE: LNW 31/84 SUNKEN BARGE, 200 FT LONG

HISTORICAL POSITION: Latitude 38° 55' 24.4"
Longitude 075° 06' 07.65"
Datum NAD 83

SSS POSITION: Lat 38 55' 08.0"
Long 075° 06' 03.0"
Easting 11395
Northing 9500
141.485

SURVEY REQUIREMENTS:

METHOD OF INVESTIGATION:

Echosounder _____ Side Scan _____ Diver Other (specify) _____

DIVE DATA: Divers Pavelle/BERKOWITZ

Time of Dive: Commenced 1533 Completed 1549

Current 0.3 Visibility 2-3 FT Bottom Type SILT, MUD

RESULTS OF INVESTIGATION: DIVERS DESLUMPED BUOY LINE AND LOCATED SCATTERED DEBRIS WITH HEAVY GROWTH. THE LEAST DEPTH ITEM STOOD 3-4 FT OFF THE BOTTOM.

SURROUNDING WATER 13.8 meters

POSITION: Date (M/D/Y) 10 MAY 94 Time (UTC) 165635 Position No. 43063
Latitude 38° 55' 08.103" 054 Longitude 075° 06' 02.86" 03.069
LORAN-C: GRI (9960) W: 1582.0 X: 27174.6 Y: 42718.4 Z: 59251.4

LEAST DEPTH: Date (M/D/Y) 10 MAY 94 Time (UTC) 1540
Method of Least Depth: PNEUMO
Measured Least Depth: 1.42.0 2.42.0 3.42.1 Avg. 42.0 Units FT
Uncorrected Depth 12.8 (meters)
Tide Corrector -7.0 Corrected Least Depth 12.8 (meters)
0.87 39 FT (39 FT)
Recorder KP Checked By EWS

SEE SECTION U.1., PAGE 10 OF THIS REPORT FOR CHARTING RECOMMENDATION.

**NOAA SHIP WHITING
ITEM INVESTIGATION REPORT
OPR-D368-WH**

SURVEY H-10234 FIELD SHEET WH-10-2-94 M (13)
 ITEM NUMBER 8059.21P
 CHART NO. (largest scale) 12304, 35th ed., Jan 1/94, 1:80,000

DESCRIPTION OR CROSS REFERENCE(S): 8061.24P
8032.53 P

AWOIS POS: L 38° ' " N SSS POS: L 38° ' " N
 (NAD 83) λ 075° ' " W λ 075° ' " W
 E 11313
 N 10266

METHOD OF INVESTIGATION: (circle)
 Echosounder Diver Other (specify) _____

DIVE DATA: Divers Berkowitz Pavelle Quinn _____
 Time of Dive (UTC): Commenced 1348 Completed 1415
 Current Slack 0.5 kts 1 kt 1.5+ kts Bottom Type S Sh M P
 Visibility 0 1 2 3 4 5 6 7 8 9 >10

INVESTIGATION NOTES: Divers Located a 4' diameter CAN Buoy Standing UPRIGHT ON THE BOTTOM Buoy was in 47' FT OF WATER AND STOOD 9' OFF THE ¹³⁰ Bottom.
 POSITION: Date/DN 9-12-94 / 255 Time (UTC) 141815 Fix # 8068
 Easting 11313.7 Northing 10286.4
 Latitude 38° 55' 33.558" N Longitude 075° 06' 06.430" W

LORAN C: W 14 X 271 Y 427 Z 592
 (LORAN for AWOIS only. GRI = 9960, N.E. United States.)

LEAST DEPTH: Date/DN 9-12-94 / 255 Time (UTC) 1413
 Method Pneumogauge Leadline DSF-6000N
 S/N 138921 30 8406714N A105N A106N A112N C076
 Measured Depth: 1. 38.1 2. 38.2 3. 38.1 Avg. 38.1 m (ft)

Uncorrected Depth: 11.6 meters
 Tide Corrector: -0.63 meters
 Draft Corrector: 0 meters
 Velocity Corrector: 0 meters
 CORRECTED LEAST DEPTH: 11.03 meters
(37 FT)

Recorder EWB Checked by _____

SEE SECTION N.8., PAGE 13 OF THIS REPORT FOR CHARTING RECOMMENDATION.

**NOAA SHIP WHITING
ITEM INVESTIGATION REPORT
OPR-D368-WH**

SURVEY H-10234 FIELD SHEET WH-10-2-94 M (13)
 ITEM NUMBER 8056.30S
 CHART NO. (largest scale) 12304. 35th ed., Jan 1/94, 1:80,000

DESCRIPTION OR CROSS REFERENCE(S): 8000.56P
8051.36P

AWOIS POS: L 38° ' " N
 (NAD 83) λ 075° ' " W

EASTINGS ARE
A LITTLE OFF

SSS POS: L 38° ' " N
 λ 075° ' " W

E 11510
 N 1076 10,076

METHOD OF INVESTIGATION: (circle)

Echosounder Diver Other (specify) _____

DIVE DATA: Divers Berkowitz Pavelle Quinn _____
 Time of Dive (UTC): Commenced 1335 Completed 1345
 Current Slack 0.5 kts 1 kt 1.5+ kts Bottom Type S Sh M P
 Visibility 0 1 2 3 4 5 6 7 8 9 >10

INVESTIGATION NOTES:

ANCHOR BLOCK 5x5' ^{2'} ~~2'x1'~~
 OFF THE BOTTOM 46 MAX DEPTH

POSITION: Date/DN 9-12-94 1255 Time (UTC) 142109 Fix # 8069
 Easting 11502.9 Northing 10081.8
 Latitude 38° 55' 26.920" N Longitude 075° 05' 58.580" W

LORAN C: W 14 X 271 Y 427 Z 592
 (LORAN for AWOIS only. GRI = 9960, N.E. United States.)

LEAST DEPTH: Date/DN 9-12-94 1255 Time (UTC) 0940 1340
 Method Pneumogauge Leadline DSF-6000N
 S/N 138921 30 8406714N A105N A106N A112N C076

Measured Depth: 1. 42.8 2. 42.8 3. 42.8 Avg. 42.8 m

Uncorrected Depth: 13.0 meters
 Tide Corrector: -0.2 meters
 Draft Corrector: 0 meters
 Velocity Corrector: 0 meters
 CORRECTED LEAST DEPTH: 12.8 meters

Recorder KWB Checked by _____

**NOAA SHIP WHITING
ITEM INVESTIGATION REPORT
OPR-D368-WH**

SURVEY H-10234 FIELD SHEET WH-10-2-94 M (13)
 ITEM NUMBER 8007.05P
 CHART NO. (largest scale) 12304, 35th ed., Jan 1/94, 1:80,000

DESCRIPTION OR CROSS REFERENCE(S):

AWOIS POS: L 38° ' " N
 (NAD 83) λ 075° ' " W
 CONTACT ~~4444~~ 11445 E/S 11455
9997 19002

SSS POS: L 38° ' " N
 λ 075° ' " W
 E 11450
 N 10000

METHOD OF INVESTIGATION: (circle)

Echosounder Diver Other (specify) _____

DIVE DATA: Divers Berkowitz Pavelle Quinn
 Time of Dive (UTC): Commenced 2003 Completed 2017
 Current (Slack) 0.5 kts 1 kt 1.5+ kts Bottom Type (S) Sh M P
 Visibility 0 (1 2) 3 4 5 6 7 8 9 >10

INVESTIGATION NOTES: Divers located metal wreckage
 ABOUT 35' DIAMETER STANDING
 ABOUT 6' OFF THE BOTTOM.

POSITION: Date/DN 9-12-94 1255 Time (UTC) 193622 Fix # 8070
 Easting 11451.2 Northing 10004.8
 Latitude 38° 55' 24.424" N Longitude 075° 06' 00.727" W

LORAN C: W 15227.1 X 27175.1 Y 42721.7 Z 59262.8
 (LORAN for AWOIS only. GRI = 9960, N.E. United States.)

LEAST DEPTH: Date/DN 9-12-94 1255 Time (UTC) 2011
 Method (Pneumogauge) Leadline DSF-6000N
 S/N (138921 30) 8406714N A105N A106N A112N C076

Measured Depth: 1. 42.6 2. 42.6 3. 42.6 Avg. 42.6 m (ft)

Uncorrected Depth: 13.0 meters
 Tide Corrector: -1.75 meters
 Draft Corrector: 0 meters
 Velocity Corrector: 0 meters
CORRECTED LEAST DEPTH: 11.35 meters
(38FT)

Recorder _____ Checked by _____

**NOAA SHIP WHITING
ITEM INVESTIGATION REPORT
OPR-D368-WH**

SURVEY H-10234 FIELD SHEET WH-10-2-94 M (13)
 ITEM NUMBER 8007.02P
 CHART NO. (largest scale) 12304. 35th ed., Jan 1/94, 1:80,000

DESCRIPTION OR CROSS REFERENCE(S): 8052.01P

AWOIS POS: L 38° ' " N SSS POS: L 38° ' " N
 (NAD 83) λ 075° ' " W λ 075° ' " W
8007.02P 11441.9 11455 8052
9962 9967
 E 11449
 N 9964

METHOD OF INVESTIGATION: (circle)
 Echosounder Diver Other (specify) _____

DIVE DATA: Divers Berkowitz Pavelle Quinn
 Time of Dive (UTC): Commenced 2028 Completed _____
 Current Slack 0.5 kts 1 kt 1.5+ kts Bottom Type S Sh M P
 Visibility 0 1 2 3 4 5 6 7 8 9 >10

INVESTIGATION NOTES: DIVERS LOCATED SCATTERED
PEBRIS 30' LONG 3' OFF
THE BOTTOM 2' WIDE DIVERS
NOTED 3" DIAMETER PIPES.

POSITION: Date/DN 9-12-94 1255 Time (UTC) 194059 Fix # 8071
 Easting 11457.5 Northing 9967.8
 Latitude 38° 55' 23.224" N Longitude 075° 06' 00.466" W

LORAN C: W 15827.7 X 27175.1 Y 42721.6 Z 59262.8
 (LORAN for AWOIS only. GRI = 9960, N.E. United States.)

LEAST Date/DN 9-12-94 1255 Time (UTC) 2043
 DEPTH: Method Pneumogauge Leadline DSF-6000N
 S/N 13892130 8406714N A105N A106N A112N C076

Measured Depth: 1. 45.0 2. 45.2 3. 45.0 Avg. _____ m ft

Uncorrected Depth: 13.8 meters
 Tide Corrector: -1.4 meters
 Draft Corrector: 0.6 meters
 Velocity Corrector: 0.1 meters
 CORRECTED LEAST DEPTH: 13.1 meters
43 (FT)

Recorder _____ Checked by _____

SEE SECTION D.2) OF THE EVALUATION REPORT FOR DISCUSSION AND CHARTING RECOMMENDATION.

**NOAA SHIP WHITING
ITEM INVESTIGATION REPORT
OPR-D368-WH**

SURVEY H-10234 FIELD SHEET WH-10-2-94 M (13)
 ITEM NUMBER 8006.41S 8047.10P
 CHART NO. (largest scale) 12304. 35th ed., Jan 1/94, 1:80,000

DESCRIPTION OR CROSS REFERENCE(S): 8006.41S Best to use for Position.

AWOIS POS: L 38° ' " N SSS POS: L 38° ' " N
 (NAD 83) λ 075° ' " W λ 075° ' " W
 EASTINGS 11383 - 11375
 NORTHINGS 9862 - 9850
 E 11383
 N 9862

METHOD OF INVESTIGATION: (circle)
 Echosounder _____ Diver _____ Other (specify) _____

DIVE DATA: Divers Berkowitz Pavelle Quinn
 Time of Dive (UTC): Commenced 2100 Completed 2120
 Current Slack 0.5 kts / 1 kt / 1.5+ kts Bottom Type S Sh M P
 Visibility 0 1 2 3 4 5 6 7 8 9 >10

INVESTIGATION NOTES: DIVERS LOCATED TWISTED 1/4" PLATE METAL WRECKAGE OVER A 50' DIAMETER WRECKAGE STOOD 3' OFF THE BOTTOM.

POSITION: Date/DN 9-12-94 1255 Time (UTC) 194839 Fix # 8075
 Easting 11375.0 Northing 9869.9
 Latitude 38° 55' 20.050" N Longitude 075° 06' 03.893" W

LORAN C: W 14827.4 X 27175.3 Y 42720.7 Z 59262.4
 (LORAN for AWOIS only. GRI = 9960, N.E. United States.)

LEAST DEPTH: Date/DN 9-12-94 1255 Time (UTC) 2115
 Method Pneumogauge Leadline DSF-6000N
 S/N 138921 30 8406714N A105N A106N A112N C076
 Measured Depth: 1. 43.5 2. 43.5 3. 43.6 Avg. 43.5 m ft

Uncorrected Depth: 13.2 meters
 Tide Corrector: -1.65 meters
 Draft Corrector: 0 meters
 Velocity Corrector: 0 meters
 CORRECTED LEAST DEPTH: 11.67 meters
 (38 FT)

Recorder _____ Checked by _____

SEE SECTION (0.1) OF THE EVALUATION REPORT FOR DISCUSSION AND CHARTING RECOMMENDATION.

NON-FLOATING AIDS AND LANDMARKS FOR CHARTS

<u>Light List #</u>	<u>Name</u>	<u>Position</u>	<u>Positioned DN/Year</u>	<u>Position</u>
1535	BROWN SHOAL LIGHT	38° 55.35' N 075° 06.01' W	129/1994	38° 55' 20.762" N 075° 06' 00.609" W



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

September 13, 1994

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

Dear Sir:

The NOAA ship WHITING conducted a side scan sonar survey in a 500-meter search radius around the charted wreck near buoy 'WR9' in Delaware Bay. During this survey WHITING located five items which were investigated by divers. The following table summarizes our findings:

<u>Feature</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Depth (ft)</u>
Anchor Block	38°55'26.920"N	075°05'58.580"W	42
Submerged Buoy	38°55'33.558"N	075°06'06.430"W	36
Wreckage	38°55'24.424"N	075°06'00.727"W	38
Wreckage	38°55'23.224"N	075°06'00.466"W	41
Wreckage	38°55'20.050"N	075°06'03.893"W	39

The wreckage investigated by WHITING divers was determined to be the remains of the charted wreck at latitude 38°55'24.40" N 075°06'07.650" W. This wreck is marked by buoy 'WR9'.

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 of the area.

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

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

Sincerely,

John D. Wilder
Commander, NOAA
Commanding Officer

Attachments

cc: AMC1
N/CG2
NCG244
DMAHTC



REPORT OF UNCHARTED SUBMERGED FEATURE

Hydrographic Survey Registry Number: H-10234

State: Delaware

General Locality: Delaware Bay

Sublocality: 2.5 Nautical Miles Southwest of Brown Shoal

Project Number: OPR-D368-WH

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

Object Discovered:

An uncharted anchor block was found with side scan sonar and further investigated with divers. Divers located an anchor block, 5 feet by 5 feet standing 2 feet off the bottom.

Covers:

Divers used a pneumatic depth gauge to determine the least depth. Their findings indicate a least depth of 12.8 meters (42ft) corrected to MLLW with predicted tide correctors. WHITING does not recommend charting this item.

Affected Nautical Charts:

<u>Chart Number</u>	<u>Edition No.</u>	<u>Date</u>	<u>Reported Depth</u>	<u>Chart Datum</u>	<u>Geographic Latitude</u>	<u>Longitude</u>
12304	35	Jan 1/94	42ft	NAD83	38°55'26.920"N	075°05'58.580"W

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

REPORT OF UNCHARTED SUBMERGED FEATURE

Hydrographic Survey Registry Number: H-10234

State: Delaware

General Locality: Delaware Bay

Sublocality: 2.5 Nautical Miles Southwest of Brown Shoal

Project Number: OPR-D368-WH

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

Object Discovered:

An uncharted submerged buoy was found with side scan sonar and further investigated with divers. Divers located a submerged buoy with a 4 foot diameter standing upright, 9 feet off the bottom.

Covers:

Divers used a pneumatic depth gauge to determine the least depth. Their findings indicate a least depth of 11.0 meters (36ft) corrected to MLLW with predicted tide correctors. WHITING recommends charting an obstruction with least depth known.

Affected Nautical Charts:

<u>Chart Number</u>	<u>Edition No.</u>	<u>Date</u>	<u>Reported Depth</u>	<u>Chart Datum</u>	<u>Geographic Latitude</u>	<u>Location Longitude</u>
12304	35	Jan 1/94	36ft	NAD83	38°55'33.558"N	075°06'06.430"W

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

REPORT OF CHARTED SUBMERGED FEATURE

Hydrographic Survey Registry Number: H-10234

State: Delaware

General Locality: Delaware Bay

Sublocality: 2.5 Nautical Miles Southwest of Brown Shoal

Project Number: OPR-D368-WH

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

Object Investigated:

Scattered debris was found with side scan sonar and further investigated with divers. Divers located metal wreckage over a 35 foot diameter standing 6 feet off the bottom at the least depth location.

Covers:

Divers used a pneumatic depth gauge to determine the least depth. Their findings indicate a least depth of 11.5 meters (38ft) corrected to MLLW with predicted tide correctors. WHITING recommends a wreck with least depth known be charted at the following position.

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	Jan 1/94	38ft	NAD83	38°55'24.424"N	075°06'00.727"W

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

REPORT OF UNCHARTED SUBMERGED FEATURE

Hydrographic Survey Registry Number: H-10234

State: Delaware

General Locality: Delaware Bay

Sublocality: 2.5 Nautical Miles Southwest of Brown Shoal

Project Number: OPR-D368-WH

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

Object Discovered:

Scattered debris was found with side scan sonar and further investigated with divers. Divers located scattered debris approximately 30 feet long by 2 feet wide standing 2 feet off the bottom at the least depth location. Also noted 3-inch diameter pipes among the debris.

Covers:

Divers used a pneumatic depth gauge to determine the least depth. Their findings indicate a least depth of 12.4 meters (41ft) corrected to MLLW with predicted tide correctors. WHITING does not recommend charting this item due to its close proximity to more significant wreckage.

Affected Nautical Charts:

<u>Chart Number</u>	<u>Edition No.</u>	<u>Date</u>	<u>Reported Depth</u>	<u>Chart Datum</u>	<u>Geographic Latitude</u>	<u>Longitude</u>
12304	35	Jan 1/94	41ft	NAD83	38°55'23.224"N	075°06'00.466"W

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

REPORT OF UNCHARTED SUBMERGED FEATURE

Hydrographic Survey Registry Number: H-10234

State: Delaware

General Locality: Delaware Bay

Sublocality: 2.5 Nautical Miles Southwest of Brown Shoal

Project Number: OPR-D368-WH

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

Object Discovered:

Scattered debris was found with side scan sonar and further investigated with divers. Divers located scattered debris over a 50 foot diameter standing 3 feet off the bottom at the least depth location.

Covers:

Divers used a pneumatic depth gauge to determine the least depth. Their findings indicate a least depth of 11.7 meters (39ft) corrected to MLLW with predicted tide correctors. WHITING does not recommend charting this item due to its close proximity to more significant wreckage.

Affected Nautical Charts:

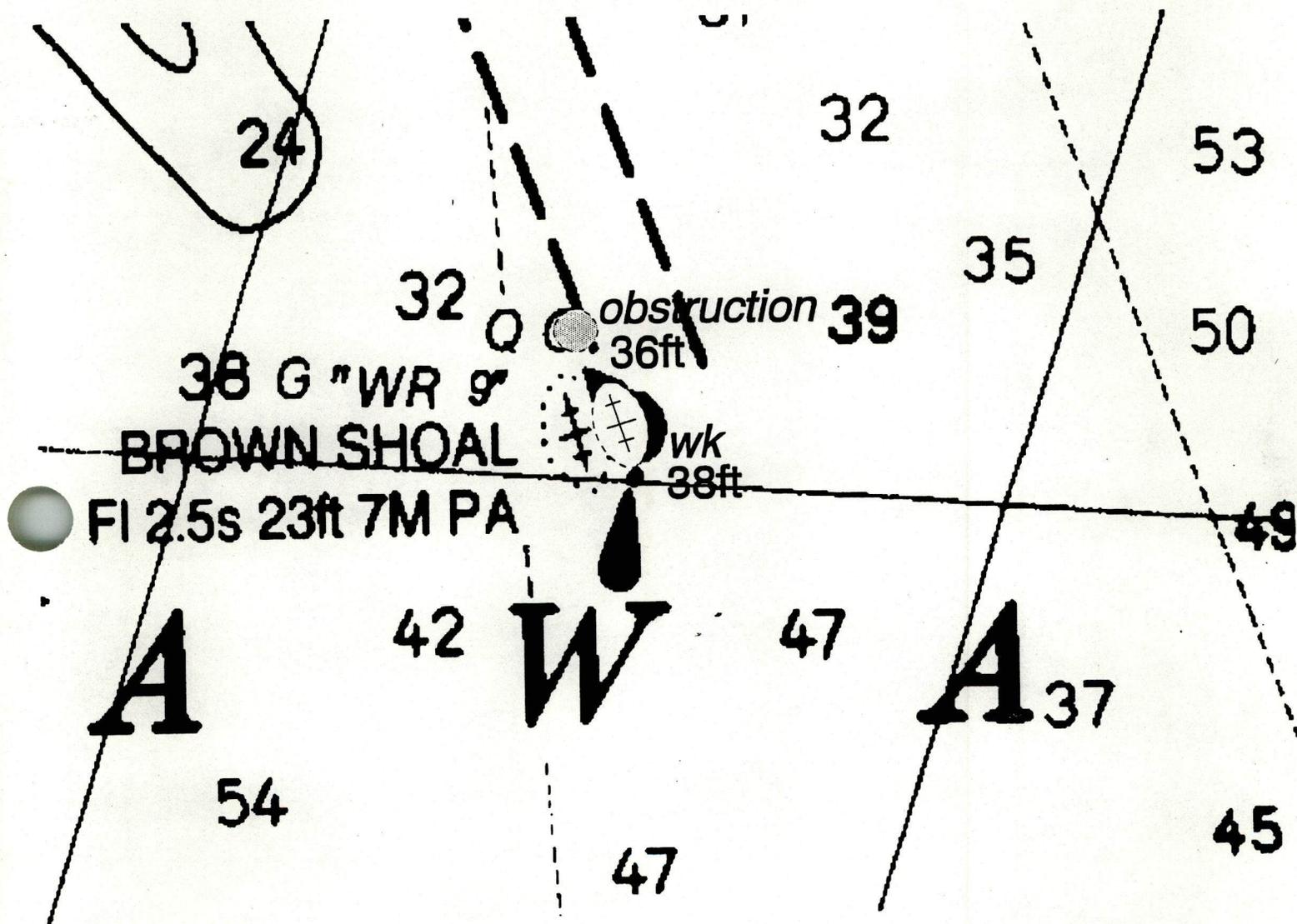
<u>Chart Number</u>	<u>Edition No.</u>	<u>Date</u>	<u>Reported Depth</u>	<u>Chart Datum</u>	<u>Geographic Location</u>	
					<u>Latitude</u>	<u>Longitude</u>
12304	35	Jan 1/94	39ft	NAD83	38°55'20.050"N	075°06'03.893"W

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

NOAA Ship WHITING SURVEY RESULTS

AWOIS 8401 ITEM INVESTIGATION

September 1994

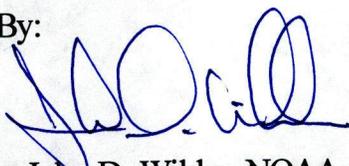


This image was scanned from Chart 12304
and is not to scale.

**APPROVAL SHEET
HYDROGRAPHIC SURVEY
OPR-D368-WH
1994
WH-10-2-94
H-10243**

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



TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: November 21, 1994

MARINE CENTER: Atlantic

HYDROGRAPHIC PROJECT: OPR-D368-WH

HYDROGRAPHIC SHEET: H-10234

LOCALITY: Delaware Bay, Delaware 2.5 NM Southwest of Brown Shoal

TIME PERIOD: September 11 - 12, 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

1. South of $38^{\circ} 54.0'N$, north of $38^{\circ} 50.0'N$ and east of $75^{\circ} 07.0'W$, times are direct, and apply a x1.05 range ratio to heights using Lewes Breakwater Harbor, Delaware (855-7380).
2. South of $38^{\circ} 54.0'N$, north of $38^{\circ} 50.0'N$ and west of $75^{\circ} 07.0'W$, apply a +10 minute time correction and a x1.05 range ratio to heights using Lewes Breakwater Harbor, Delaware (855-7380).
3. North of $38^{\circ} 54.0'N$, south of $38^{\circ} 56.0'N$ and east of $75^{\circ} 07.0'W$, times are direct, and apply a x1.10 range ratio to heights using Lewes Breakwater Harbor, Delaware (855-7380).
4. North of $38^{\circ} 54.0'N$, south of $38^{\circ} 56.0'N$ and west of $75^{\circ} 07.0'W$, apply a +20 minute time correction, and a x1.10 range ratio to heights using Lewes Breakwater Harbor, Delaware (855-7380).



5. North of $38^{\circ} 56.0'N$, south of $38^{\circ} 59.0'N$ and west of $75^{\circ} 10.0'W$, apply a +24 minute time correction, and a x1.13 range ratio to heights using Lewes Breakwater Harbor, Delaware (855-7380).
6. North of $38^{\circ} 56.0'N$, south of $38^{\circ} 59.0'N$ and east of $75^{\circ} 10.0'W$, apply a +10 minute time correction, and a x1.18 range ratio to heights using Lewes Breakwater Harbor, Delaware (855-7380).
7. North of $38^{\circ} 59.0'N$, south of $39^{\circ} 02.0'N$ and west of $75^{\circ} 10.0'W$, apply a +36 minute time correction, and a x1.20 range ratio to heights using Lewes Breakwater Harbor, Delaware (855-7380).
8. North of $38^{\circ} 59.0'N$, south of $39^{\circ} 02.0'N$ and east of $75^{\circ} 10.0'W$, apply a +15 minute time correction, and a x1.24 range ratio to heights using Lewes Breakwater Harbor, Delaware (855-7380).

Note: Times are tabulated in Eastern Standard Time.



CHIEF, DATUMS SECTION

GEOGRAPHIC NAMES

H-10234

Name on Survey	ON CHART NO. 12304										
	ON PREVIOUS SURVEY NO.										
	CON U.S. QUADRANGLE MAPS										
	FROM LOCAL INFORMATION										
	ON LOCAL MAPS										
	P.O. GUIDE OR MAP										
	RAND McNALLY ATLAS										
	U.S. LIGHT LIST										
	A	B	C	D	E	F	G	H	K		

BROWN SHOAL (title)	X										1
DELAWARE (title)	X										2
DELAWARE BAY (title)	X										3
											4
											5
											6
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											25

Approved:

Charles E. Harrington
Chief Geographer - N / CG2x5

NOV - 4 1994

07/19/95

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H-10234

NUMBER OF CONTROL STATIONS

2

NUMBER OF POSITIONS

1806

NUMBER OF SOUNDINGS

9146

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	59	08/08/94
VERIFICATION OF FIELD DATA	87	12/20/94
QUALITY CONTROL CHECKS	11	
EVALUATION AND ANALYSIS	25	
FINAL INSPECTION	2	01/23/95
COMPILATION	12	06/14/95
TOTAL TIME	196	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		07/06/95

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H-10234 (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 0.404 seconds (12.47 meters or 1.25 mm at the scale of the survey) north in latitude, and 1.339 seconds (32.25 meters or 3.22 mm at the scale of the survey) east in longitude.

L. JUNCTIONS

H-10537 (1994) to the northwest

A standard junction was effected between the present survey and survey H-10537 (1994) to the northwest.

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

M. COMPARISON WITH PRIOR SURVEYS

a. Hydrographic

H-9202 (1971) 1:20,000

Prior survey H-9202 (1971) covers the present survey in its entirety. The prior survey soundings are in agreement with the present survey soundings.

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

b. Wire Drag

H-9172WD (1970) 1:20,000
H-9758WD (1976) 1:20,000

Comparison with prior survey H-9172WD (1970) reveals three uncharted hangs and twenty-two uncharted 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 conflicts between the prior survey effective clearance depths and the present survey depths, along a line from Latitude 38°57'15"N, Longitude 75°11'58"W to Latitude 38°53'50"N, Longitude 75°09'00"W. These conflicts may be attributed to natural changes in the bottom configuration; these conflicts should be disregarded.

Comparison with prior survey H-9758WD (1976) revealed two charted hangs within the common area. The two hangs have been assigned Automated Wreck and Obstruction Information System (AWOIS) Item numbers #1223 and #1224. These items are adequately discussed in sections N.2. and N.3., of the Descriptive Report, respectively, and require no further discussion.

O. COMPARISON WITH CHARTS 12214 (37th Edition, Jun 27/92)
12304 (35th Edition, Jan 1/94)

The charted hydrography originates with the previously discussed prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in sections N. and O. of the Descriptive Report. The following should be noted:

1) An uncharted dangerous sunken wreck with a least depth of 11⁷ m (38 ft), in Latitude 38°55'20.05"N, Longitude 75°06'03.89"W, was located by the field unit. It is recommended that a dangerous sunken wreck with a least of 11⁷ m (38 ft), (11⁷Wk), and a danger curve be charted as shown on the present survey.

2) An uncharted dangerous sunken wreck with a least depth of 13¹ m (43 ft), in Latitude 38°55'23.22"N, Longitude 75°06'00.47"W, was located by the field unit. It is recommended that a dangerous sunken wreck with a least depth of 13¹ m (43 ft), (13¹Wk), and a danger curve be charted as shown on the present survey.

The present survey is adequate to supersede the charted hydrography within 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 using the present survey has been

done by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division upon completion of survey.

WHITING Processing Team

Robert Snow

Robert Snow
Cartographic Technician

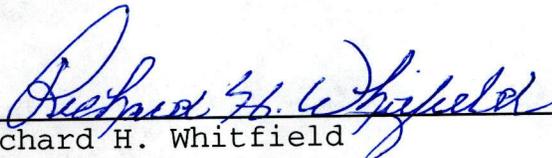
Norris A. Wike

Norris A. Wike
Cartographer

APPROVAL SHEET
H-10234

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: 7-6-95

Final Approval:

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

Date: Aug 15, 1995

