

F00467

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 / Multibeam

*Field No.* WH-10-4-02

*Registry No.* F00467

### LOCALITY

*State* New Jersey / Delaware

*General Locality* Delaware Bay

*Locality* Delaware Bay and Approaches

2000

CHIEF OF PARTY  
LCDR Gerd F. Glang

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DATE

March 25, 2002

NOAA FORM 77-28 U.S. DEPARTMENT OF COMMERCE  
(11-72) NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

REGISTRY NUMBER:

**HYDROGRAPHIC TITLE SHEET**

**F00467**

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

FIELD NUMBER:

**WH-10-4-00**

State: New Jersey - Delaware

General Locality: Delaware Bay

Sub-Locality: Delaware Bay and Approaches

Scale: 1:10,000

Date: July 17, 19-23, 27, August 10-11, 26, September 7-9, 14, 2000

Instructions Dated: July 1, 1999 Project Number: OPR-D392-WH

Vessel: NOAA Ship WHITING, S-329

Chief of Party: Lieutenant Commander Gerd F. Glang, NOAA

Surveyed by: WHITING Personnel

Soundings by: Odom Echotrac DF3200 MK II Echosounder

Graphic record scaled by: WHITING Personnel

Graphic record checked by: WHITING Personnel

Protracted by: N/A Automated Plot: HP DESIGNJET 2500 HP-750C

Verification by: Atlantic Hydrographic Branch PERSONNEL

Soundings in: FEET  
Meters at MLLW

Remarks:

- 1) All Times are UTC.
- 2) This is a Field Examination Survey.
- 3) Projection is UTM Zone 18.

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

AWOIS/SURF ✓ 2/25/02 STV

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**A. PROJECT**

**A.1.** This field examination was conducted in accordance with Hydrographic Survey Letter Instructions OPR-D392-WH, Delaware Bay and Approaches, New Jersey - Delaware.

**A.2.** The original instructions are dated July 1, 1999.

**A.3.** There is one change to the original letter instructions dated July 1, 2000.

**A.4.** This Descriptive Report includes items assigned as field examinations in the letter instructions, and resolves items from surveys completed by WHITING in 1999. One item was initiated by the Hydrographer. See Table 1.

**A.5.** Project OPR-D392-WH responds to requests from the Pilots Association for the Bay and River Delaware, and the Mariners Advisory Committee for the Bay and River Delaware. Both groups are concerned with routing vessel traffic in and out of Delaware Bay. The acquisition of modern hydrography and the detection or disapproval of wrecks and obstructions will provide more options for vessel traffic management.

**Table 1: F00467 Field Examinations**

ITEM	HISTORY	F00467 SUMMARY	HPS PROJECT /SHEET
AWOIS 1082	Wreck located with 200% SSS during WHITING survey H10931 (1999).	100% SWMB coverage. No significant contacts found. Item insignificant. Chart surveyed soundings.	<del>F00467</del> <del>Fe2000</del> /sheet <del>23</del> 7
AWOIS 1084	Wreck NINA located with 200% SSS during WHITING survey F00453 (1999).	100% SWMB coverage. Least depth <del>61</del> ft. Chart <del>61</del> ft wreck. 62      62	<del>F00467</del> <del>Fe2000</del> /sheet <del>18</del> 3
AWOIS 2723	Wreck of THERESA I located with 200% SSS and VBES developments during WHITING survey F00453 (1999).	100% SWMB coverage. Least depth 16 ft. Retain charted 15 ft w/ wrecks.	<del>F00467</del> <del>Fe2000</del> /sheet <del>24</del> 8
AWOIS 2724	Wreck of GRAZE located with 200% SSS and VBES developments during WHITING survey F00435 (1999).	100% SWMB coverage. Least depth 14 ft. Chart a 14 ft wreck. Submitted as a Danger to Navigation.	<del>F00467</del> <del>Fe2000</del> /sheet <del>24</del> 8

ITEM	HISTORY	F00467 SUMMARY	HPS PROJECT /SHEET
<b>AWOIS 8132</b>	Pilots Association requested investigation of wreck during F00467 (2001). LORAN position provided.	200% SSS and 100% SWMB coverage. No wreckage found. LORAN position was incorrect. Chart surveyed soundings.	<del>F00467 Fe2000</del> /sheet <del>16</del> 2
<b>AWOIS 8402</b>	Wreck located with 200% SSS during WHITING survey H10446 (1992).	100% SWMB coverage. Least depth 56 ft. Chart 56 ft wreck.	<del>F00467 Fe2000</del> /sheet <del>25</del> 11
<b>AWOIS 8975</b>	Wreck located with 200% SSS during WHITING survey H10446 (1993).	100% SWMB coverage. Least depth 57 ft. Chart 57 ft wreck.	<del>F00467 Fe2000</del> /sheet <del>25</del> 10
<b>AWOIS 9291</b>	Wreck located with 200% SSS during WHITING survey H10476 (1993).	Same as AWOIS 8402.	<del>F00467 Fe2000</del> /sheet <del>25</del> 11
<b>AWOIS 9935</b>	Wreck <b>STAR DUST</b> located with VBES developments during WHITING survey H10917 (1999).	100% SWMB coverage. Least depth <del>102</del> ft. Chart a <del>102</del> ft wreck. 101                      101	<del>F00467 Fe2000</del> /sheet 01
<b>AWOIS 9992</b>	Obstruction located with 200% SSS and VBES developments during WHITING survey F00453 (1999).	100% SWMB coverage. Least depth 35 ft. Chart a 35 ft rock.	<del>F00467 Fe2000</del> /sheet <del>24</del> 9
<b>AWOIS 10401a</b>	Wreck <b>BEAR RIDGE</b> located with 200% SSS during WHITING survey H10935 (1999). No VBES development.	100% SWMB coverage. Least depth <del>46</del> ft. Chart a <del>46</del> ft wreck. 47                      47	<del>F00467 Fe2000</del> /sheet <del>19</del> 4
<b>AWOIS 10401b</b>	Obstruction located with 200% SSS while searching for AWOIS 10401a ( <b>BEAR RIDGE</b> ) during WHITING survey H10935 (1999).	100% SWMB coverage. Least depth <del>30</del> ft. Chart a <del>30</del> ft obstruction. Submitted as a Danger to Navigation.	<del>F00467 Fe2000</del> /sheet <del>19</del> 4
<b>Cape May Inlet</b>	Cape May Inlet surveyed at the discretion of WHITING Command as part of survey F00467 (2000).	100% SWMB coverage. Least depth 11 ft. Chart an 11 ft sounding. Submitted as a Danger to Navigation.	capemay /sheet <del>24</del> 12
<b>30 ft Shoal</b>	Shoaling identified using 200% SSS and VBES development during WHITING survey H10954 (1999).	100% SWMB coverage. Least depth 30 ft. Chart a 30 ft sounding. Submitted as a Danger to Navigation.	<del>F00467 Fe2000</del> /sheet <del>19</del> 5
<b>51 ft Sounding</b>	Pilots Association requested investigation of a charted 51 ft (chart 12214) during WHITING survey F00467 (2000).	100 % SWMB coverage. Least depth 49 ft. Chart a 49 ft sounding. Submitted as a Danger to Navigation.	<del>F00467 Fe2000</del> /sheet <del>28</del> 10

ITEM	HISTORY	F00467 SUMMARY	HPS PROJECT /SHEET
<b>16 ft Sounding</b>	A 20 ft sounding was identified using 200% SSS and VBES developments during WHITING survey H10917 (1999).	100% SWMB coverage. Least depth 16 ft. Chart a 16 ft sounding. Submitted as a Danger to Navigation.	<del>F00467</del> <del>Fe2000</del> /sheet01
<b>T/V MICHAEL Grounding Site</b>	Pilots Association requested an investigation of a grounding site during WHITING survey F00467 (2000).	100% SWMB coverage. Two critical least depths were identified, a <del>35</del> 45 ft and a 48 ft. Chart a <del>35</del> 45 ft and a 48 ft sounding. Submitted as a Danger to Navigation.	<del>F00467</del> <del>Fe2000</del> /sheet22 6
<b>Uncharted Rock</b>	Contact 230_008_1555_1 located using 200% SSS and VBES developments during WHITING survey F00453 (1999).	100% SWMB coverage. Least depth 34 ft. Chart a 34 ft rock. Submitted as a Danger to Navigation.	Fe2000 /sheet24 9

## **B. AREA SURVEYED**

**B.1.** This survey covers various AWOIS items and item investigations assigned as part of OPR-D392-WH in the approaches to Delaware Bay and within Delaware Bay.

**B.2.** Investigations were divided into different HPS sheets all under project F00467, except for the Cape May reconnaissance which is under the HPS project called "capemay", sheet ~~24~~ 24. Some sheets have multiple AWOIS items and/or investigations. This project has irregular boundaries. See Figure 1 for approximate survey boundaries. See Table 1 for HPS project and sheet directories.

**B.3.** Data acquisition for this survey began on July 17, 2000, (DN 199) and ended on September 14, 2000 (DN 258).

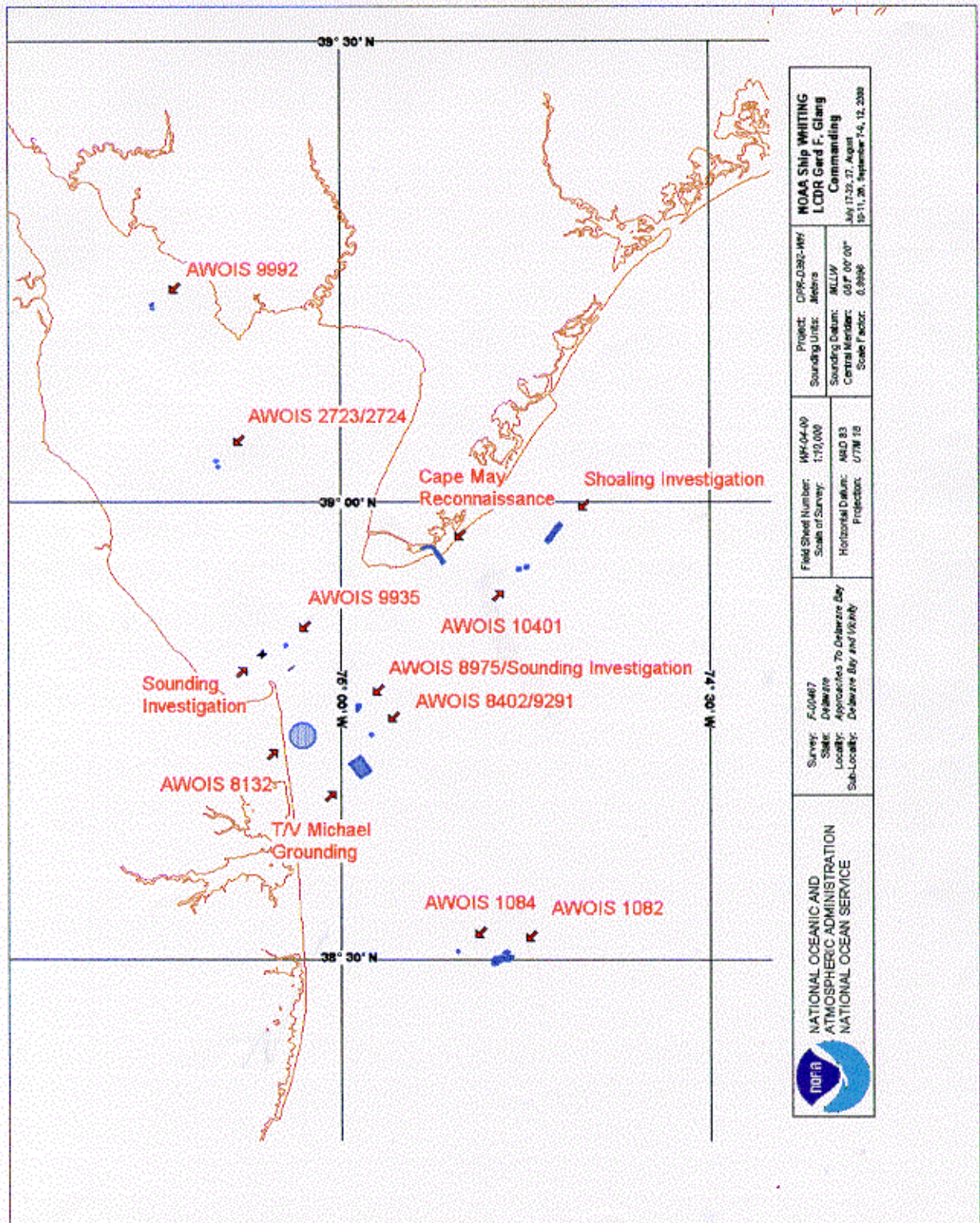


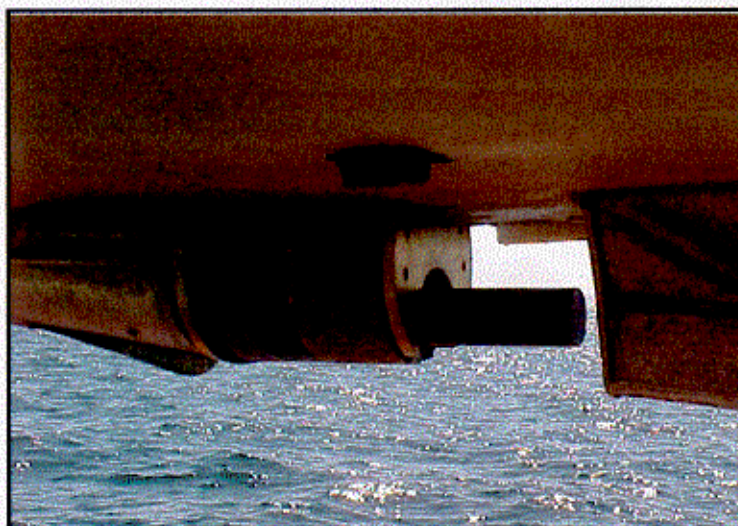
Figure 1: F00467 item survey boundaries.

### C. SURVEY VESSELS

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

Vessel	Operations
NOAA Launch 1014	Hydrography, Dive, and Side Scan Operations
NOAA Launch 1005	Shallow Water Multibeam Operations

C.2. The transducer for the shallow water multibeam (SWMB) sonar was mounted approximately amidships on Launch 1005. A section of the launch keel was removed, and the Reson SeaBat 8101 transducer was hull-mounted along the centerline of the vessel. See **Figure 2**, and **Appendix E** for offset data.



**Figure 2:** Reson SeaBat 8101 SWMB Transducer.

### D. AUTOMATED DATA ACQUISITION AND PROCESSING

*SEE ALSO THE  
EVALUATION REPORT*

D.1. A detailed list of data acquisition and processing software used for this survey can be found in **Appendix H**. \*

Vertical beam echosounder (VBES) data acquisition was accomplished using Coastal Oceanographics **HYPACK** (version 10.03) software. VBES data processing was accomplished using the **HYDROGRAPHIC PROCESSING SYSTEM** (HPS) software and assorted utility programs

*\* DATA FILED WITH ORIGINAL FIELD RECORDS*



contained on the **HYDROSOFT** (version 9.4 and 10.6.1) compact disk provided by the Hydrographic Systems and Technology Programs (HSTP).

All side scan sonar (SSS) and shallow water multibeam (SWMB) data were acquired using Triton Elics International (TEI) **ISIS** software. **ISIS** (version 4.32) was used for side scan data acquisition, and **ISIS** version 4.54 was used for SWMB data acquisition. Digital SSS data and SWMB data were post-processed using Universal Systems Limited (USL) **CARIS SIPS** and **HIPS** for UNIX, and **CARIS-NT**.

The Sea-Bird Electronics SBE-19 SeaCat Profilers were initialized and configured using **SEASOFT** (version 3.3M) and **SEACAT** (version 2.0) software. The program **VELOCIWIN** (version 5.0) was used to process CTD data and calculate sound velocity corrections.

**D.2.** Reson SeaBat 8101 SWMB data were monitored using **ISIS** during acquisition and post-processed with **CARIS HIPS**. Following acquisition, SWMB data were converted from **ISIS xtf** to **CARIS HDCS** using the **CARIS xtfToHDCS** program.

Post-processing SWMB data was accomplished using the **CARIS HIPS** programs **hdcs** and **Swath Editor**. Vessel heading, attitude, and navigation data were reviewed and edited in **hdcs** line mode (viewed as time series data). Fliers or gaps in heading, attitude, or navigation data were manually rejected or interpolated for small periods of time. **HDCS** data were then SVP corrected to compute processed depths. Using **Swath Editor**, all depth data were reviewed line-by-line and ping-by-ping as a time series. Obvious depth fliers were rejected. All data more than 60° to either side of nadir after application of roll data were filtered out, reducing effective swath width to 120°. This is in accordance with the draft Standing Project Instructions to reduce potential refraction errors in beams more than 60° off nadir. After all data types (navigation, attitude, heading, and depth) were reviewed and edited, the **HDCS** line files were merged to rotate processed depths into the earth reference frame. Merged lines were then reviewed in the **hdcs** subset mode, which provides an areal context to edit and clean sounding data.

After post-processing in **CARIS HIPS**, data were exported to a **CARIS** workfile using the **CARIS refohdcs.com** script set for shoal-biased, line-by-line binning with a 15 meter grid size. From the **CARIS** workfile, data was exported using the **CARIS noasoun.com** script to generate a \*.dat file. The \*.dat file was imported into the **HPS** database using the **HP Tools HIPS Converter** function.

All **HDCS** data were exported, thinned, and loaded into **HPS** in this manner.

AWOIS 8132 item investigation data for use in **CORRELATOR**, and for field sheet presentation, was extracted from **HPS** data using the **HPS\_MI Draw Depths** function.

For all other sheets, item investigation data for use in **CORRELATOR** was extracted directly from **CARIS HDCS** data using the **CARIS-NT HIPS Export** function. **Export** parameters were set for shoal-biased, line-by-line binning with a 15 meter grid size and a text file was generated. Soundings extracted from the **CARIS-NT HIPS Export** data set are fully attributed with the HDCS **project/vessel/day/line/ping/beam** (p/v/d/l/p/b) source. The SWMB Source Data field given in the item investigation forms (Section M) enables traceability of item depths to the HDCS data by **p/v/d/l/p/b**.

And, for all other sheets (except AWOIS 8132), soundings used for field sheet presentation were extracted from the **CARIS-NT HIPS Export** text file using the **HPS\_MI Draw Caris Depths** function.

All field sheets were prepared in **MAPINFO**.

Sun-illuminated Digital Terrain Models (DTMs) were created in **CARIS-NT Spatial Editor** from the full-density **HDCS** data to demonstrate SWMB coverage and to visually check for SWMB artifacts. The **Spatial Editor** grids full-density SWMB data and generates a mean seabed surface by a weighting scheme based on sonar beam footprint dimensions and grazing angles. Sun-illumination is used to highlight the seabed features. **Spatial Editor** DTMs were created as specified in the NOS Hydrographic Surveys Specifications and Deliverables. The **WorldReg** MapBasic application was used to register **Spatial Editor** DTMs for analysis in MapInfo.

ODOM ECHOTRAC echogram records were monitored and annotated during acquisition. Vertical beam echosounder (VBES) data were collected digitally using **HYPACK** and converted into the **HPS** database using **HPTools**. VBES analog records (paper) were manually compared with digitized selected soundings and scanned for missed depths. Additional selected soundings were inserted where necessary to define peaks and abrupt changes in slope. Edits and inserted depths were applied to the **HPS** database using **HPS**. VBES fixes were flagged for rejection if the Horizontal Dilution of Precision (HDOP) exceeded 3.0. Data were smoothed or rejected where stuck heave (unusually high values for heave) was observed. VBES offset and velocity tables were applied in **HPS**. Tide zoning and corrections were applied in **HPTOOLS**. After review and editing, VBES depths were drawn in **MAPINFO**. VBES data collected in conjunction with SWMB data were not processed. These data sets were moved to a VBES subdirectory in the sheet directory. **These data are not to be used for smooth sheet compilation.**

## **E. SONAR EQUIPMENT**

**E.1.** Launches 1005 and 1014 used the 100 kHz Edgetech Model 272 towfish for side scan operations.

**E.2.** The EdgeTech towfish are configured with a standard 20° below horizontal beam angle depression.

**E.3.** A 100 kHz frequency for the EdgeTech was used throughout the survey.

**E.4(a).** The 75 meter range scale was used in development areas with shoal depths. Edgetech side scan sonar operations are limited on all platforms to a speed-over-ground of 5.5 knots.

**E.4(b).** Daily confidence checks were conducted during data acquisition by observing bottom features such as sand waves, scours, and naturally-occurring contrast of sea floor characteristics in the side scan imagery.

**E.4(c).** During item investigations, if a definitive contact resembling the AWOIS item description was located, the remaining area of the search radius was not covered with side scan. The feature was developed with SWMB for least depth determination. If no definitive contacts were found, the entire search radius was covered with 200% side scan.

Side scan sonar coverage was determined by using mosaics generated in **CARIS SSMOS** and imported into **MapInfo** using the **mosaic2tiftab** program. Any deficiencies in the side scan sonar data were found, and a holiday line file was created from the mosaics to complete the 200% requirement.

**E.4(d).** Occasional thermocline problems were observed in the sonar imagery. Affected data were rejected and re-acquired at a later date after the thermocline dissipated.

**E.4(e).** Launches 1005 and 1014 are equipped with a J-arm and Superwinch on their quarter. The Superwinch is spooled with a Kevlar cable that is lead overboard to the towfish through a nylon block. The cable is then connected to the side scan sonar recorder via a slip-ring assembly in the Superwinch.

**E.4(f).** Cable-out aboard the launches was determined manually and entered into **HYPACK** during acquisition.

**E.5.** Contact investigations were conducted using SWMB or divers. SWMB swath coverage was monitored during data acquisition to insure 100% multibeam swath ensonification of significant contacts. Side scan contacts for AWOIS items 1082, 1084, 2723, 2724, 9935, 9992, and 10401 are contacts from WHITING surveys H10917, H10931, and F00453. All contacts were merged into one master contact file for analysis in **CORRELATOR**. Detailed descriptions of all investigated contacts are addressed in the Item Investigation reports found in Section M.

**E.6.** Side scan sonar data were converted from **XTF** (ISIS raw format) to **HDCS** using the **CARIS**

**xtfToHDCS** program. Side scan data were post-processed using **CARIS SSMOS** and **SSEDIT** (sub-programs of **SIPS**).

Post-processing **HDCS** side scan data includes examining and editing fish height, vessel heading (*gyro*), and vessel navigation records. Fish navigation is recalculated using the **CARIS SSEDIT Recompute SSS Navigation** sub-program.

After fish navigation is recalculated, side scan imagery data are slant-range corrected using **CARIS SSEDIT**. The slant-range corrected side scan imagery data are closely examined for any targets. Targets-of-interest are evaluated as potential contacts based on apparent shadow length and appearance; especially targets which appear to be not natural in origin. Contacts are selected and saved to a **CARIS** Contact file for each line of **HDCS** data. Contact selection includes measuring apparent height, selecting contact position, and creating a contact snapshot (\*.tif) image. Contact data files and snapshots are imported to the **HPS** contact database for evaluation with the **CORRELATOR** program.

The **CORRELATOR** program enables a systematic review of each contact, and relevant sounding data, in geographic context with the AWOIS search radius, a raster image of the applicable nautical chart, and any supporting DTM's generated from SWMB data. By querying individual contact data and examining associated snapshots, significance can be quickly established; significant contacts can then be evaluated and considered for least-depth determination by SWMB development or diver investigation.

Contact significance is determined by contact height to water depth ratio (i.e. contact height greater than 1 meter in water depths of 20 meters or less, or contact height greater than 10% of the water depth in deeper waters). Contacts not meeting this criteria may be selected as significant if targets appear to be not natural in origin.

**CORRELATOR** screen captures for contacts with specific charting recommendations are included in Section M of this Descriptive Report. All contacts from each **HPS** sheet were combined into one master contact file and correlated using one depth file (FE\_All\_Depth), one track file (FE\_All\_Track), and one combined DTM (Fe\_all\_seam).

## **F. SOUNDING EQUIPMENT**

**F.1.** Launches 1014 and 1005 use an ODOM ECHOTRAC DF3200 MKII vertical beam echosounder. Both high (100 kHz) and low (24 kHz) frequency depths were recorded during data acquisition. The high frequency returns served as the primary sounding source for VBES data.

Both SWMB and VBES data were acquired by Launch 1005. SWMB data were acquired using a Reson SeaBat 8101 SWMB sonar system equipped with an extended range projector. The extended range projector increases the Reson SeaBat 8101's operational depth (maximum slant range) from 320 m to 450 m. The SeaBat 8101 is a 240 kHz SWMB system which measures relative water depths across a 150° swath; each swath consisting of 101 individually formed 1.5° x 1.5° beams.

VBES data were acquired with an ODOM ECHOTRAC DF3200 MKII echosounder. VBES data acquired during side scan sonar operations, or acquired specifically for VBES developments, were fully scanned and processed using **HPS**.

VBES data acquired concurrent to SWMB operations was used for real-time comparison with SWMB nadir beams for data quality assurance. These VBES data sets were located in a subdirectory of the sheet, and were not processed. **VBES data acquired concurrent to SWMB operations are not to be used for smooth sheet compilation.**

The following table lists the VBES system used for each vessel.

Vessel	SOUNDING SYSTEM S/N
NOAA Launch 1014	ODOM ECHOTRAC - 9655
NOAA Launch 1005	ODOM ECHOTRAC - 9644 Reson Processor- 13976 Reson 8101 Transducer - 020800JCG

**F.2.** One Diver Least Depth Gauge (DLDG - s/n 68338) was used during this survey. The DLDG gauge was calibrated on January 6, 2000 by PTC Electronics Incorporated

Dive investigations on this survey were primarily for contact and AWOIS identification, and confirmation of least-depths. **All least depths for these field examinations were determined from SWMB data.**

**F.3.** There were no faults in sounding equipment that affected data accuracy or quality.

**F.4.** Both high (100 kHz) and low (24 kHz) frequency depths were recorded during data acquisition. The high frequency returns served as the primary sounding source for VBES data (except as discussed in paragraph F.1).

**F.5.** SWMB data were acquired using the 75-m range scale with a line spacing of twice the water depth for developments, and three time the water depth for mainscheme coverage.

**F.6.** SWMB main scheme lines were acquired at up to 7.5 kts whenever sea conditions allowed. For SWMB developments, vessel speed was reduced to 5.5 kts to maintain the 3.2 pings per 3 m along track coverage criteria.

Areas with strong current did affect the data. Speed determined by DGPS does not take into account speed through water. In particular, strong currents were observed at the northeast entrance to Harbor of Refuge and in the Cape May Inlet. Survey lines run orthogonal to the current were not possible due to shoreline restrictions.

### **G. CORRECTIONS TO SOUNDINGS**

**G.1 (a).** Sound velocity through water was determined using a Sea-Bird SBE 19 SeaCat Sound Velocity Profiler (SVP - s/n 196093-1060). SeaCat data quality assurance was conducted as per the FPM. This unit was calibrated February 23, 2000 by Sea-Bird Electronics, Inc.

**VELOCWIN** (ver. 4.0) was used to process SVP data and generate VBES and SWMB sound velocity corrector tables. The following sound velocity casts apply to survey F00467:

<b>File Name</b>	<b>DN</b>	<b>Vessel</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Cast Depth (M)</b>
00202131	202	1005	38° 50' 04" N	075° 06' 18" W	8.7
00203172	203	1005	38° 30' 42" N	074° 49' 43" W	23.9
00203153	203	1005	38° 36' 12" N	074° 39' 34" W	29.0
00205143	205	Ship	38° 44' 54" N	074° 55' 46" W	42.3
00205154	205	1005	38° 56' 01" N	074° 45' 13" W	16.0
00208143	208	1005	38° 57' 00" N	075° 09' 48" W	21.4
00207184	207	1005	38° 57' 00" N	075° 09' 48" W	15.8
00208143	208	1005	38° 57' 53" N	075° 10' 43" W	16.3
00209151	209	1005	38° 57' 04" N	074° 43' 11" W	17.1
00209181	209	1005	38° 57' 04" N	074° 43' 11" W	17.9
00218185	218	1005	38° 35' 54" N	074° 40' 55" W	23.3
00218201	218	1005	38° 36' 38" N	074° 36' 50" W	31.4
00224125	224	1005	38° 43' 51" N	075° 17' 10" W	13.3

File Name	DN	Vessel	Latitude	Longitude	Cast Depth (M)
00224153	224	1005	38° 44' 37" N	075° 02' 16" W	12.7
00224165	224	1005	38° 44' 55" N	074° 55' 45" W	44.4
00239175	239	1005	38° 29' 52" N	074° 47' 30" W	29.3
00251150	251	1005	39° 13' 10" N	075° 15' 10" W	7.4
00251190	251	1005	39° 02' 29" N	075° 10' 04" W	12.0
00251220	251	1005	38° 57' 10" N	075° 10' 15" W	20.7
00252141	252	1005	38° 50' 30" N	075° 04' 34" W	44.6
00252154	252	1005	38° 46' 12" N	074° 58' 57" W	20.6
00252171	252	Ship	38° 44' 54" N	074° 55' 43" W	45.4
00252173	252	1005	38° 44' 50" N	074° 57' 03" W	18.9
00252184	252	1005	38° 42' 47" N	074° 57' 57" W	18.6
00258135	258	1005	38° 37' 35" N	074° 54' 44" W	21.4
00258172	258	1005	38° 36' 16" N	074° 46' 31" W	19.6

**G.1.(b)** The following leadline comparisons with the ODOM ECHOTRAC DF3200 MKII apply to survey F00467:

Vessel	Area	Latitude	Longitude	DN
1005	Key West, FL	24°33'07"N	081°48'34"W	136
1014	Delaware Bay	38°48'48"N	075°05'30"W	224

Weather and sea conditions were calm and proved ideal for leadline comparisons. No corrections to soundings were needed. Leadlines were calibrated on May 17, 1999 and March 13, 2000 and confirmed negligible leadline errors. Refer to the echogram records on the applicable day numbers.

**G.1.(c)** Static draft for Launch 1014 was measured on April 14, 2000 (HPS Offset Tables 2<sup>\*</sup>). Static draft correctors were applied during data post-processing for each survey vessel. Static draft corrections for Launch 1005 were measured April 14, 2000 (HPS Offset Table 3<sup>\*</sup>). These values were

*\* DATA FILED WITH ORIGINAL FIELD RECORDS*

verified April 20, 2000. The Reson Seabat 8101 sensor offsets were stored in the **CARIS** Vessel Configuration File (WH05) and were applied to SWMB data acquired with Launch 1005. The Edgetech side scan sonar sensor offsets were stored in the **CARIS** Vessel Configuration File (WH14) and were applied to side scan sonar data during the **Recompute SSS Navigation** program in **SIPS**. HPS Offset tables were applied during data processing only for VBES data acquired with all survey vessels. See Separates IV\* for data records.

**G.1(d)** Settlement and squat values for Launch 1014 were determined on May 1, 2000. Settlement and squat values for Launch 1005 were determined using OTF GPS techniques by Hydrographic Systems and Technology Programs (N/CS11), in Delaware Bay, DE on July 26, 2000. The settlement and squat correctors were applied during data processing. See Appendix E.\*

**G.1(e)** Launch 1005 is equipped with a TSS POS/MV Model 320 (serial number 020) for vessel heading and attitude determination. The POS/MV is an aided strapdown inertial navigation system (INS); it consists of an Inertial Measurement Unit (IMU) sensor and two GPS receivers. The IMU senses linear acceleration and angular motion along the three major axis of the vessel. The POS/MV's two GPS receivers determine vessel heading using carrier-phase differential position measurements.

The POS Computer System (PCS) blends data from both the IMU and the two GPS receivers to compute highly accurate vessel heading. The IMU determines accurate heading during aggressive maneuvers and is not subject to short-period noise. However, IMU accuracy characteristically diminishes over time. The GPS receivers compute a vector between two fixed antennas and provide azimuth data using the GPS Azimuth Measurement Subsystem (GAMS). GPS heading data is accurate over time, but is affected by short-period noise. The POS/MV combines both heading measurement systems into a blended solution with accuracies greater than either system could achieve alone. Heading accuracy in the POS/MV Controller software was set to 0.5 degrees.

Heave is computed in the POS/MV by performing a double integration of the IMU-sensed vertical accelerations. The heave period was left at the TSS default of 200 seconds; the recommended heave dampening coefficient of 0.71 was used.

Both roll and pitch measurements are computed by the IMU after sensor alignment and leveling. The IMU mathematically simulates a gimballed gyro platform; the sensed angular accelerations determine roll and pitch. Roll and pitch measurement accuracy in the POS/MV Controller software was set to 0.05 degrees.

Launch 1014 is equipped with a TSS Dynamic Motion Sensor Model 05 (DMS-05, serial number 2062) for vessel attitude determination. The DMS-05 consists of an array of solid state sensing elements which measure instantaneous linear accelerations and angular rates affecting the sensor in the roll, pitch and yaw directions. These measurements allow the system to determine the attitude of the

*\* DATA FILED WITH ORIGINAL FIELD RECORDS*



vessel to which the sensor is attached with respect to the true gravitational vertical. Changes in these values are used to compute the vertical translation, or vessel heave.

Data are passed to the Hypack acquisition computer as a serial message string with a 25-Hz update rate. The DMS-05 has the capability to measure attitude to 5% of the translation in question assuming an installation at the vessel's center of motion. This accuracy is degraded if the sensor is mounted further from the vessel's center of motion. The DMS-05 is mounted within one meter of the assumed center of motion (reference point, or RP) on Launch 1014, and attitude measurements are within the desired 5% envelope. The following accuracy and resolution specifications apply to the DMS-05:

Type of Motion	Accuracy	Resolution	Range
Heave	5 cm or 5%	1 cm	+/- 10 m
Roll	+/- 0.05°	0.01°	+/- 30°
Pitch	+/- 0.05°	0.01°	+/- 30°

Heave, pitch, and roll biases are applied to raw SSS and SWMB data during conversion in **CARIS**. Correctors for VBES data were applied to raw data in **HPTools** during conversion.

**G.1.(f)** Sensor offsets for Launch 1014 were confirmed by measurement on April 15, 1999. Sensor offsets for Launch 1005 were measured on March 15, 2000 and checked again on May 1, 2000. Offset values for each vessel were stored in the corresponding **CARIS** Vessel Configuration Files (VCF), and HPS Offset Table for use in data processing. See Appendix E. \*

**G.2.** No unique methods or instruments were used for sound correcting.

**G.3.** Sound velocity (SV) casts were acquired several times a day, with not more than four hours between casts. If rain occurred during acquisition, another cast was taken immediately after. Typically, one cast was acquired at the start of the day (before any data was collected), another at noon, and a third at the end of the day. The deepest areas within the survey were typically selected for SV casts.

SV data were immediately processed for quality assurance. The second and any subsequent casts were compared with the first cast of the day using a zone comparison sub-program in **VELOCIWIN** to determine if correctors were changed. During data processing, all casts for that day were concatenated into one file and applied to the corresponding **CARIS** data.

**G.4.** Strong currents in some areas caused vessel speed through water to differ from the recorded speed over ground. These speed differences were most noticeable in the **Spatial Editor** DTM's. DTM's generated with survey lines going both with and against the current show along-track step artifacts with a typical magnitude of 0.1 meters depth difference between opposing swaths. All survey lines were used as the errors, due to limitations in dynamic draft determination, were considered

\* DATA FILED WITH ORIGINAL FIELD RECORDS

negligible by the Hydrographer.

**G.5.** The tidal datum for this project is Mean Lower Low Water (MLLW). The operating tide station at Lewes, Delaware (855-7380) served as control for datum determination.

**G.6.** Zoning for this survey is consistent with the letter instructions. **HPTools** was used for Tide table creation and was used for the application of Preliminary Water Level Data during data processing. Approved tides for F00467 were requested by letter to N/OPS1 dated September 31, 1999. See Appendix D <sup>\*</sup> for tide zones used. *APPROVED TIDES AND ZONING WERE APPLIED DURING OFFICE PROCESSING.*

**G.6.(a)** Zoning was as per letter instructions.

**H. HORIZONTAL CONTROL** *SEE ALSO THE EVALUATION REPORT*

**H.1.** The horizontal datum for this survey is North American Datum of 1983 (NAD 83). No horizontal control stations were established for this survey.

**H.2.** This survey was conducted using differential Global Positioning System (DGPS). Differential correctors were received from U.S. Coast Guard (USCG) beacon stations.

**H.3.** USCG DGPS beacon stations used were Cape Henry and Cape Henlopen.

**H.4.** No diver-least-depth-gauges were use for these field examinations.

**H.5.** Horizontal Dilution of Precision (HDOP) was monitored during on-line data acquisition. If the positioning degraded beyond the acceptable limits while on-line, the data was either smoothed or rejected during post-processing.

Performance checks for WHITING and both launches were conducted with launches secured in davits using the program **Pcheck** (from the HYDROSOFT 9.4 CD-ROM). Differential correctors from the Cape Henry and Cape Henlopen USCG differential beacons were used to correct GPS signals. Simultaneous **HYPACK** positions on all three platforms were acquired and an offset distance and azimuth computed between the ship and each launch system. The computed offset distances and azimuths were compared to measured values. A summary of the DGPS performance checks is included in **Appendix G**.<sup>\*</sup> All DGPS performance checks confirmed that the equipment was working properly.

**H.6.** Serial numbers for the Trimble DSM212L receivers are 0220168291 (Launch 1005) and 0220159716 (Launch 1014).

*\* DATA FILED WITH ORIGINAL FIELD RECORDS*

Trimble receivers were initialized to the appropriate station and frequency using the **Trimble TSIP Talker** software (version 2).

**H.7.(a)** There were no unusual methods used to operate or calibrate electronic positioning equipment.

**H.7.(b)** No equipment malfunctions affected data quality.

**H.7.(c)** No unusual atmospheric conditions affected data quality.

**H.7.(d)** Adequate satellite coverage was maintained throughout the project.

**H.7.(e)** No systematic position errors were detected.

**H.7.(f)** Antenna height for Launch 1014 was confirmed by measurement on April 15, 1999. Launch 1005 horizontal and vertical offsets were measured on March 15, 2000. See Appendix E. \*

**H.7.(g)** SSS offset and layback for the launch J-arms were measured on July 28, 1993, and confirmed on April 15, 1999. The Reson SeaBat 8101 SWMB transducer is hull-mounted on Launch 1005, eliminating any layback or cable length variables. See offset diagrams in Appendix E. \*

#### **I. SHORELINE** *SEE ALSO THE EVALUATION REPORT*

No shoreline verification was required for these field examinations.

#### **J. CROSSLINES**

Crosslines were conducted as a part of each SWMB development. Launch 1005 was the only vessel to acquire crossline data. Agreement between SWMB mainscheme and development soundings was adequate, with the majority of soundings found to be within 1 to 2 feet of each other.

#### **K. JUNCTIONS** *SEE ALSO THE EVALUATION REPORT*

No junction comparisons were required for these field examinations.

*\* DATA FILED WITH ORIGINAL FIELD RECORDS*

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

No comparisons with prior surveys were required for these field examinations.

**M. ITEM INVESTIGATION REPORTS**

Assigned AWOIS items and item investigations are summarized on the following pages. The associated **CORRELATOR** pages are included following each item investigation. **All least depths acquired are corrected for verified tides.** *Refer to Table 1 for **HPS** sheet numbers.*

AWOIS No: 1082

**Item Description:** Charted sunken wreck. Located with 200% SSS during WHITING survey H10931 (1999).

**Source:** LNM31/84, WHITING H10931, 1999, PN DA CW61-98-D-0010, H10931

**AWOIS Position:** 38° 30' 06.00" N, 074° 47' 00.00" W

**Required Investigation:** SD, S2, SWMB, D1

**Radius:** 1000 m

**Charts Affected:** 12214

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**INVESTIGATION**

**Date(s):** August 26, 2000 (DN 239)

*SHEET 7  
CHART 12214*

**Position Numbers:** N/A

**Investigation Used:** SWMB

**Surveyed Position:** N/A

**Position Determined By:** DGPS

**Investigation Summary:** This item was covered with 200% side scan during WHITING survey H10931 (1999). 100% SWMB was acquired on this field examination over the SSS contacts identified during H10931. Contacts investigated were 257\_101\_2204\_1, 257\_106\_1644\_1, 257\_106\_1644\_2, 257\_111\_1003\_1, 257\_113\_0802\_1, 262\_203\_0746\_1, 264\_206\_1502\_1, and 264\_210\_1921\_1. No significant object was found with SWMB developments. Hydrographer believes wreck is no longer significant.

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**CHARTING RECOMMENDATION**

**Recommendation:** The Hydrographer recommends deleting the charted wreck symbol at the AWOIS position. Chart surveyed soundings.

*Con cur*

*Delete ~~✗~~*

257\_101\_2204\_1  
 Offset 51  
 Shad Len 0  
 Correlating Contact

Correlating Dist 0  
 SSS Height 0  
 Second Hit  
 Con Lat 38-29-45.29 N  
 Con Lon 074-47-31.07 W

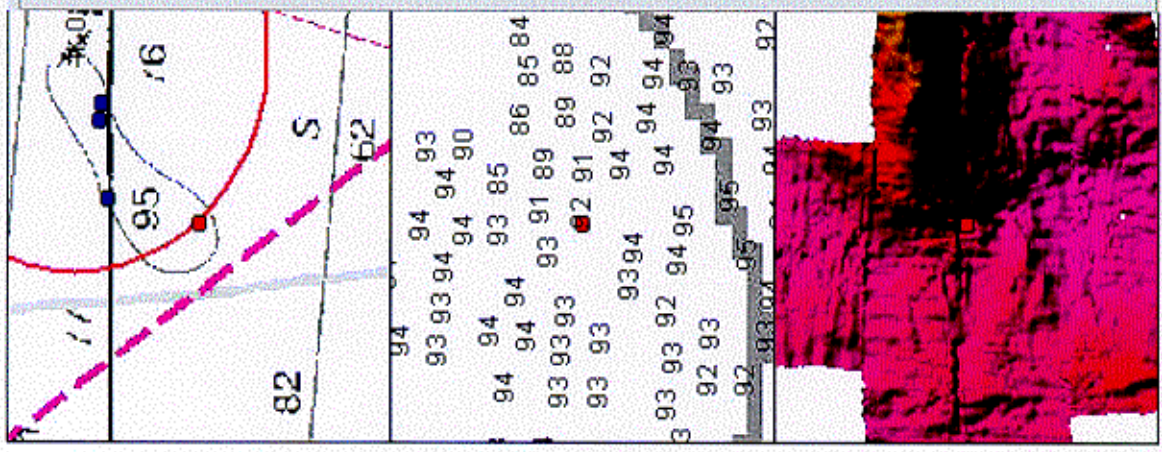
Development  
 Least Depth 28.03 m AWOIS# 0  
 Least Depth 92 ft AWOIS Dist 0  
 Day of LD 239 LD Lat 38-29-45.63 N  
 Contact Dist 13.6 LD Lon 074-47-30.71 W  
 I.D Source Fe2000\_AW1082\_SWMB\_WHO5\_2000-239\_00

Comments  
 Contact Remark 0, something here... no shadow  
 Investigation S1, SWMB  
 Charting Rec Delete charted "Wreck, not danger to surface navigation". Chart representative soundings.  
 Chart Item

Matching Swath Info  
 Line Day Fix Range  
 101 257 47112-47349  
 201 262 48063-48301



DTON  
 DTON >DTON  
 DTON <DTON  
 Fixes <Radius  
 239 0  
 239 0  
 239 0  
 239 0  
 239 0  
 Local Contacts



Resolution  
 SSS Height 0  
 Apparent Height 0.71  
 Average Depth 28.4  
 Top Depth  
 Length 0  
 Width 0  
 Significance Criteria  
 0 > 1 m < 20 m or 10 %  
 28.4 < 25  
 Both Criteria must be red for Auto-Signify

Auto-Signify Significant   
 Resolution Criteria  
 Relief is greater than X% of contact ht. 0.71 > 100 % 0  
 Multibeam Coverage   
 Number of Depths is greater than X 24 > 7  
 Top Depth is greater than local depth 28.4 > 25.6  
 Any green means resolved

Auto-Resolve Resolved   
 Resolution Notes

257\_106\_1644\_I

Offset 48  
Shad Len 0  
Correlating Contact

Correlating Dist 0

SSS Height 2.8

Second Hit

Con Lat 38-30-02.38 N

Con Lon 074-47-11.33 W

Development

Least Depth 28.09 m AWOIS# 1082  
Least Depth 92 ft AWOIS Dist 318.2  
Day of LD 239 LD Lat 38-30-02.57 N  
Contact Dist 11.2 LD Lon 074-47-11.72 W  
LD Source Fe2000\_AW1082\_SWMB\_W405\_2000-239\_00

Comments

Contact Remark 0, Good hit

Investigation S1, SWMB

Charting Rec  Chart Item  
Delete charted "Wreck, not danger to surface navigation" Chart representative soundings.

Matching Swath Info

Line Day Fix Range

106 257 45953-46186  
205 262 49007-49243

VM

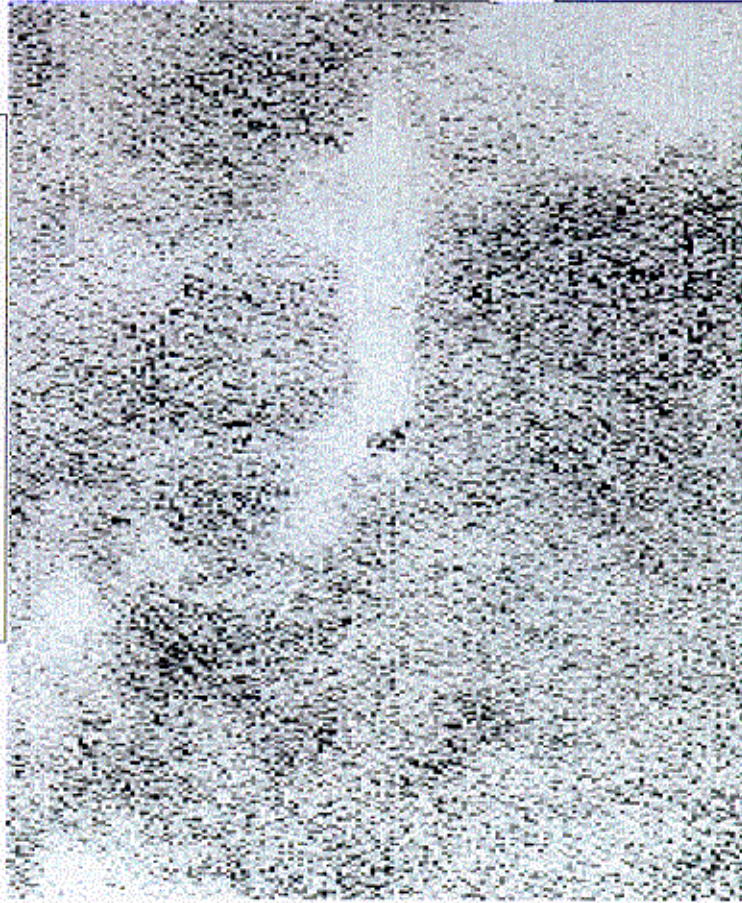
DTON >DTON

DTON

Fixes <Radius

239 0  
239 0  
239 0  
239 0  
239 0

Local Contacts



Resolution

SSS Height 2.8  
Apparent Height 0.34  
Average Depth 28  
Top Depth 0  
Length 0  
Width 0

Significance Criteria

2.8 > 1 m < 20 m or 10 %  
25.2 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify

Significant

Resolution Criteria

Relief is greater than X% of contact ht

0.34 > 100 % 2.8

Multibeam Coverage

Number of Depths is greater than X

19 > 7

Top Depth is greater than local depth

25.2 > 24.5

Any green means resolved

Auto-Resolve

Resolved

Resolution Notes

Resolution Notes text box

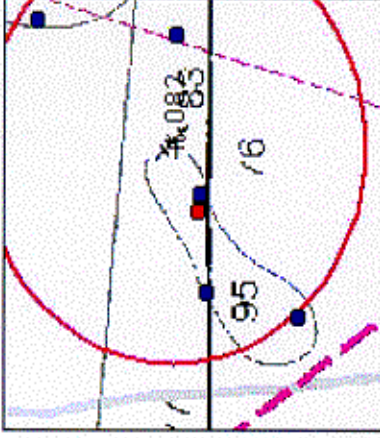
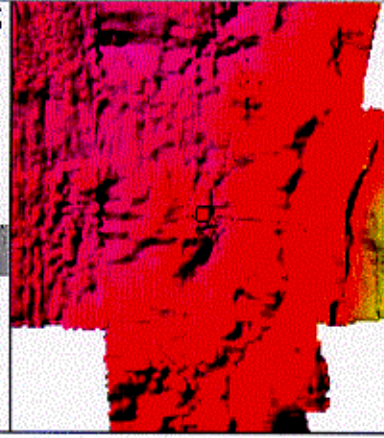


Table with columns for coordinates and values. Values include 93, 92, 91, 90, 89, 88, 87, 86, 85, 84, 83, 82, 81, 80.













264\_206\_1502\_1

Offset 67  
Shad Len 0  
Correlating Contact  
257\_106\_1644\_2

Correlating Dist  
8.3

SSS Height 1.1

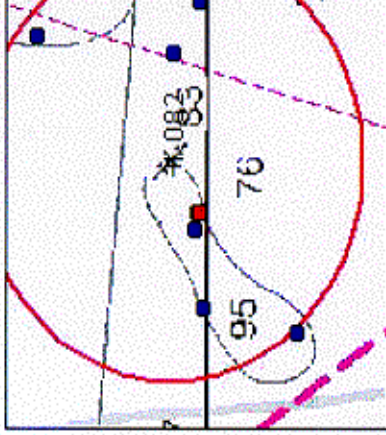
Second Hit  
Con Lat 38-30-01.85 N  
Con Lon 074-47-07.81 W

**Development**  
Least Depth 27.85 m AWOIS# 1082  
Least Depth 91 ft AWOIS Dist 248.5  
Day of LID 239 LID Lat 38-30-01.85 N  
Contact Dist 7.2 LID Lon 074-47-08.11 W  
LID Source Fe2000\_AW1082\_SWMB\_WH05\_2000-239\_00

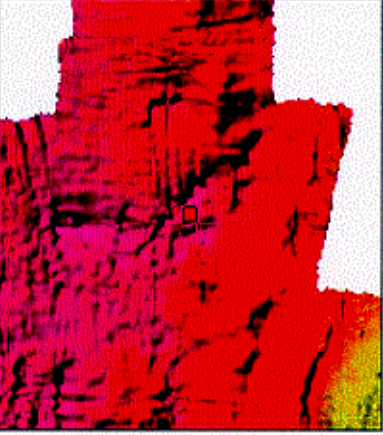
**Comments**  
Contact Remark  
Investigation  
 Rock outcrops?  
S1, SWMB  
Charting Rec  
 Chart Item  
Delete charted "Wreck, not danger to surface navigation". Chart representative soundings.

**Matching Swath Info**

Line Day Fix Range  
106 257 45953-46186  
205 262 49007-49243  
206 264 49312-49487



93	92	93	93	93	92
93	93	93	93	93	93
92	93	91	93	91	92
92	93	93	93	89	92
91	90	90	92	91	91
90	90	90	91	91	90
86	87	88	89	91	90
81	84	84	89	87	86
88					



**Resolution**  
SSS Height 1.1  
Apparent Height 0.81  
Average Depth 28.1  
Top Depth  
Length 0  
Width 0  
**Significance Criteria**  
1.1 > 1 m < 20 m or 10 %  
27 < 25  
Both Criteria must be red for Auto-Signify

Auto-Signify    Significant

**Resolution Criteria**  
Relief is greater than X% of contact ht  
0.81 > 100 % 1.1  
Multibeam Coverage   
Number of Depths is greater than X  
24 > 7  
Top Depth is greater than local depth  
27 > 25.8  
Any green means resolved

Auto-Resolve    Resolved   
Resolution Notes

DTON >DTON  
 DTON  
Fixes <Radius

239 0  
239 0  
239 0  
239 0  
239 0

Local Contacts  
257\_106\_1644\_2 8.26

264\_210\_1921\_1

Offset 51  
Shad Len 0  
Correlating Contact

Correlating Dist 0

SSS Height 1.5

Second Hit  
Con Lat 38-30-05.95 N  
Con Lon 074-46-37.53 W

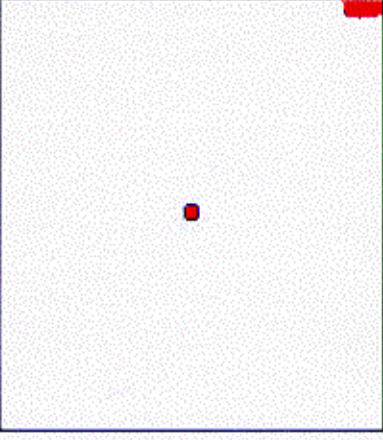
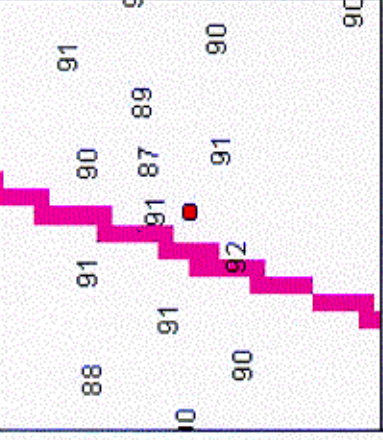
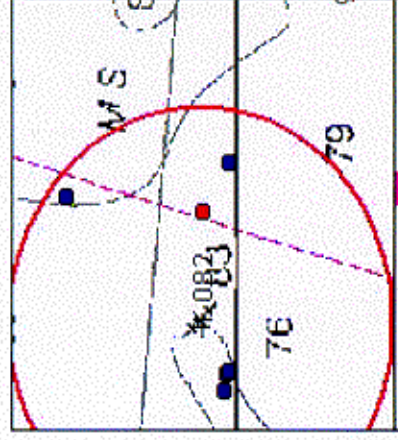
**Development**  
Least Depth 0 m AWOIS# 1082  
Least Depth 0 ft AWOIS Dist 518.9  
Day of LD 0 LD Lat 38-30-05.51 N  
Contact Dist 99999.9 LD Lon 074-46-34.19 W  
LD Source

**Comments**  
Contact Remark  
Investigation  Rock Pile  
SI, SWMB  
Charting Rec  Chart Item  
Delete charted "Wreck, not danger to surface navigation". Chart representative soundings.

**Matching Swath Info**

Line Day Fix Range  
110 257 45053-45240  
209 264 49566-50205  
210 264 50206-50443

VM



**Resolution**  
SSS Height 1.5  
Apparent Height 0  
Average Depth 27.5  
Top Depth 0  
Length 0  
Width 0  
Significance Criteria  
1.5 > 1 m < 20 m or 10 %  
26 < 25  
Both Criteria must be red for Auto-Signify

Auto-Signify Significant   
**Resolution Criteria**  
Relief is greater than X% of contact ht.  
0 > 100 % 1.5  
Multibeam Coverage   
Number of Depths is greater than X  
0 > 7  
Top Depth is greater than local depth  
26 > 26.5  
Any green means resolved

Auto-Resolve Resolved   
Resolution Notes

DTON -> DTON  
 DTON  
Fixes < Radius

Local Contacts

304\_106\_1517\_1

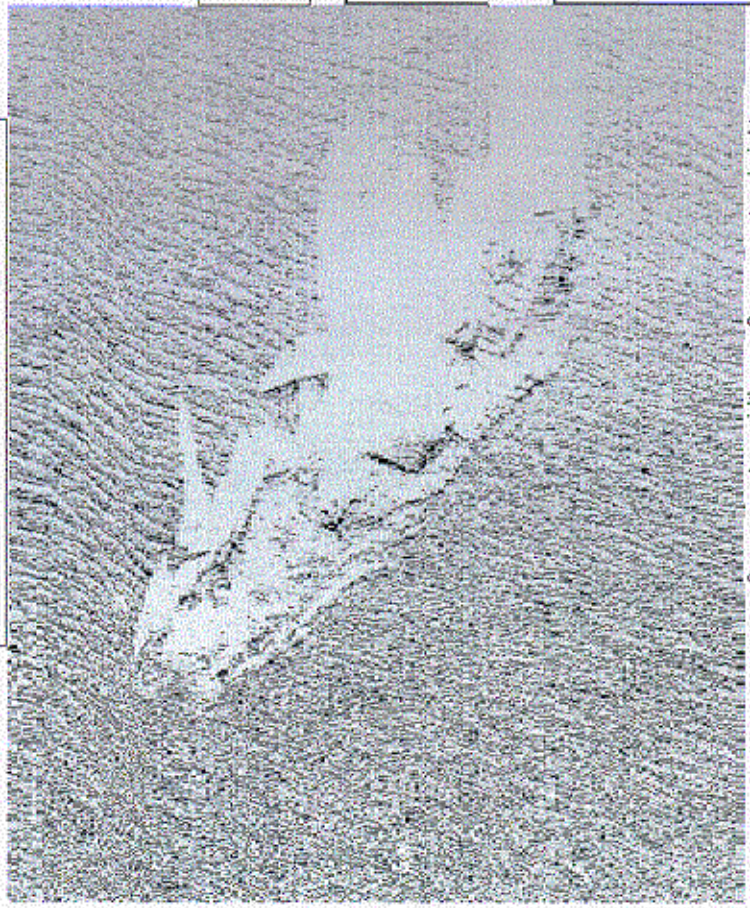
Offset 58  
Shad Len 0  
Correlating Contact  
304\_300\_1627\_1

Correlating Dist 8  
SSS Height 4  
 Second Hit  
Con Lat 38-30-31.95 N  
Con Lon 074-50-32.47 W

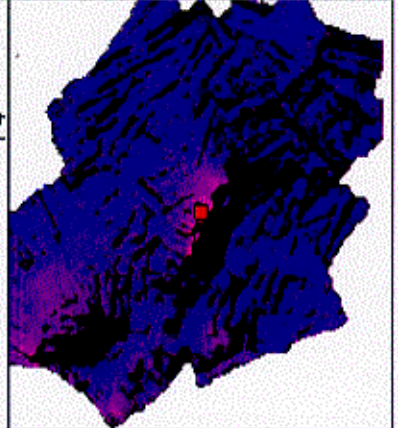
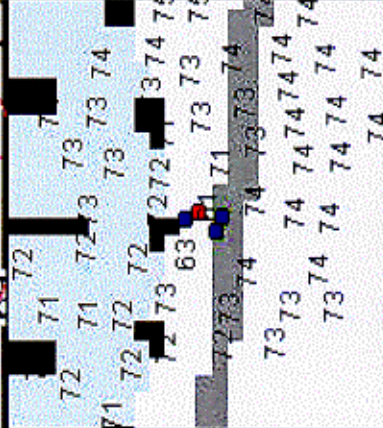
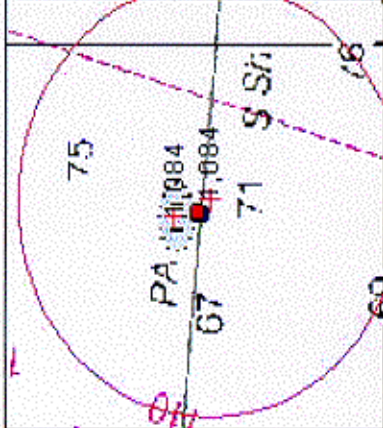
**Development**  
Least Depth 18.82 m AWOIS# 1084  
Least Depth 61 ft AWOIS Dist 85  
Day of I.D 203 LD Lat 38-30-31.79 N  
Contact Dist 6.5 LD Lon 074-50-32.31 W  
LD Source Fe2000\_18\_Aw1084\_WHD5\_2000-203\_003

**Comments**  
Contact Remark 0, Found incomplete awois 1084  
Investigation SWMB  
Charting Rec Chart 'wreck, least depth known by sounding only, 61m' at surveyed position.  
 Chart Item  
W/RK

Matching Swath Info  
Line Day Fix Range



DTON >DTON  
 DTON  
Fixes <Radius  
2  
203 0  
203 0  
203 0  
203 0  
Local Contacts  
304\_107\_1529\_1 12.1  
304\_300\_1627\_1 7.97  
304\_300\_1645\_1 12.2



**Resolution**  
SSS Height 4  
Apparent Height 4.08  
Average Depth 22.4  
Top Depth 0  
Length 0  
Width 0  
Significance Criteria  
4 > 1 m < 20 m or 10 %  
18.4 < 25  
Both Criteria must be red for Auto-Signify

Auto-Signify Significant

**Resolution Criteria**  
Relief is greater than X% of contact ht. 4.08 > 100 % 4  
Multibeam Coverage   
Number of Depths is greater than X. 60 > 7  
Top Depth is greater than local depth. 18.4 > 19.4  
Any green means resolved

Auto-Resolve Resolved   
**Resolution Notes**  
Found in F-004SS with side scan sonar.

304\_107\_1529\_1

Offset 90  
Shad Len 0  
Correlating Contact  
304\_300\_1645\_1

Correlating Dist 8.5  
SSS Height 2.5  
 Second Hit  
Con Lat 38-30-31.69 N  
Con Lon 074-50-32.85 W

**Development**  
Least Depth 18.82 m AWOIS# 1084  
Least Depth 61 ft AWOIS Dist 86.3  
Day of LD 203 LD Lat 38-30-31.79 N  
Contact Dist 13.5 LD Lon 074-50-32.31 W  
LD Source Fe2000\_18\_Aw/1084\_W/105\_2000-203\_003\_

**Comments**  
Contact Remark 0, Found incomplete awois 1084  
Investigation SWMB  
Charting Rec Chart 'wreck, least depth known by sounding only, 61'' at surveyed position.  
 Chart Item



0 100 meters width 0 100 meters height

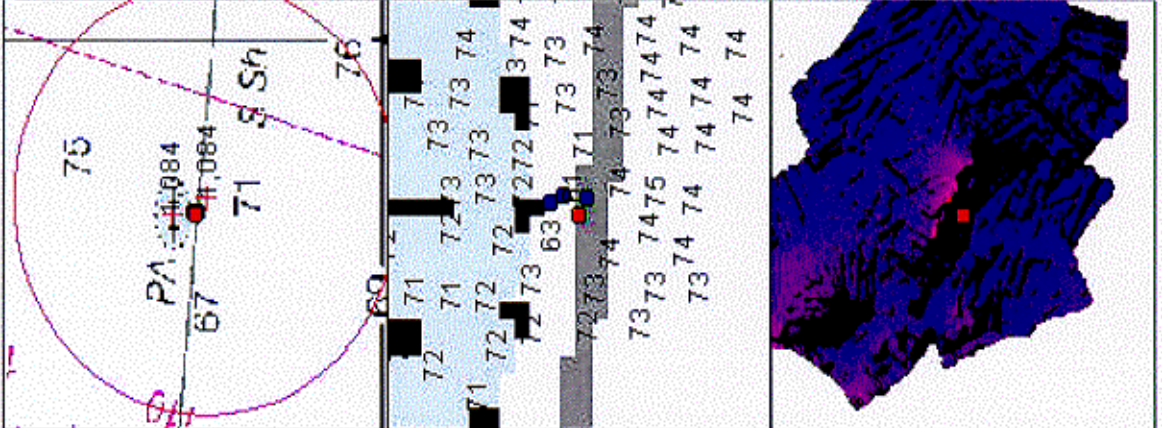
**Matching Swath Info**  
Line Day Fix Range

VM

DTON  
 DTON  
DTON

Fixes <Radius  
2 203 0  
203 0  
203 0  
203 0

**Local Contacts**  
304\_106\_1517\_1 12.1  
304\_300\_1627\_1 16.4  
304\_300\_1645\_1 8.53



**Resolution**  
SSS Height 2.5  
Apparent Height 4.25  
Average Depth 22.4  
Top Depth  
Length 0  
Width 0  
**Significance Criteria**  
2.5 > 1 m < 20 m or 10 %  
19.9 < 25  
Both Criteria must be red for Auto-Signify

Auto-Signify  Significant

**Resolution Criteria**  
Relief is greater than X% of contact ht. 4.25 > 100 % 2.5  
Multibeam Coverage  
Number of Depths is greater than X. 44 > 7  
Top Depth is greater than local depth. 19.9 > 19.4  
Any green means resolved

Auto-Resolve  Resolved  
**Resolution Notes**  
Found in F-00453 with side scan sonar.

304\_300\_1645\_1

Offset -32

Shad Len 0

Correlating Contact

304\_107\_1529\_1

Correlating Dist

8.5

SSS Height 4.2

Second Hit

Con Lat 38-30-31.56 N

Con Lon 074-50-32.53 W

Development

Least Depth 18.82 m AWOIS# 1084

Least Depth 61 ft AWOIS Dist 77.9

Day of I.D 203 LD Lat 38-30-31.79 N

Contact Dist 9 LD Lon 074-50-32.31 W

LD Source Fe2000\_18\_Aw1084\_WI105\_2000-203\_003

Comments

Contact Remark 0, Found incomplete awois 1084

Investigation SWMB

Charting Rec

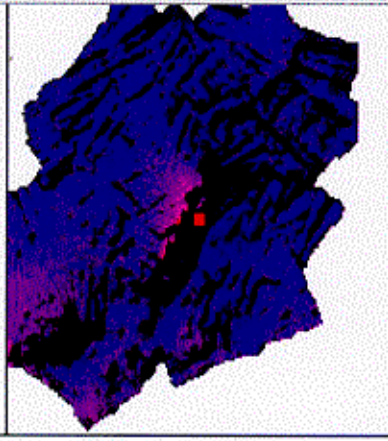
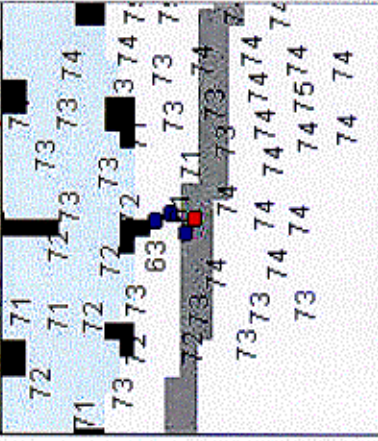
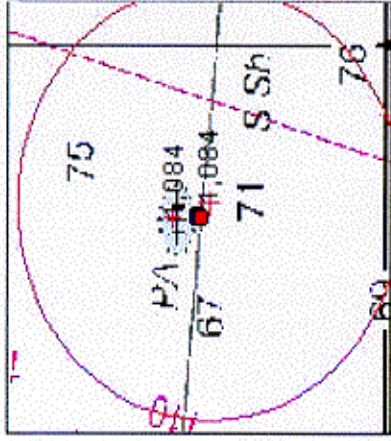
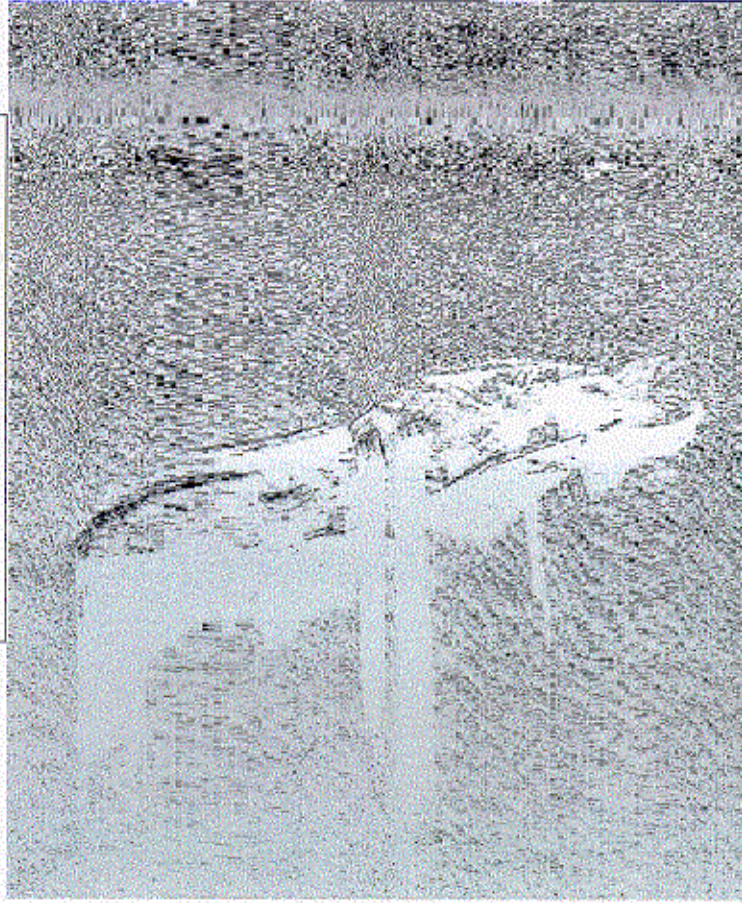
Chart Item

Chart "wreck, least depth known by sounding only, 61" at surveyed position.

Matching Swath Info

Line Day Fix Range

VM



Resolution

SSS Height 4.2

Apparent Height 4.25

Average Depth 22.4

Top Depth 0

Length 0

Width 0

Significance Criteria

4.2 > 1 m < 20 m or 10 %

18.2 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact ht.

4.25 > 100 % 4.2

Multibeam Coverage

Number of Depths is greater than X

51 > 7

Top Depth is greater than local depth

18.2 > 19.4

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

Found in F-00453 with side scan sonar.

-DTON ->DTON

DTON

Fixes <Radius

2

203 0

203 0

203 0

203 0

Local Contacts

304\_106\_1517\_1 12.2

304\_107\_1529\_1 8.53

304\_300\_1627\_1 19.4



304\_300\_1627\_1

Offset 26  
Shad Len 0  
Correlating Contact  
304\_106\_1517\_1

Correlating Dist 8

SSS Height 3.8

Second Hit

Con Lat 38-30-32.19 N

Con Lon 074-50-32.61 W

Development

Least Depth 18.82 m AWOIS# 1084  
Least Depth 61 ft AWOIS Dist 92.6  
Day of LD 203 LD Lat 38-30-31.79 N  
Contact Dist 14.3 LD Lon 074-50-32.31 W  
LD Source Fe2000\_18\_Aw1084\_WHD5\_2000-203\_003\_

Comments

Contact Remark 0, Found incomplete awois 1084

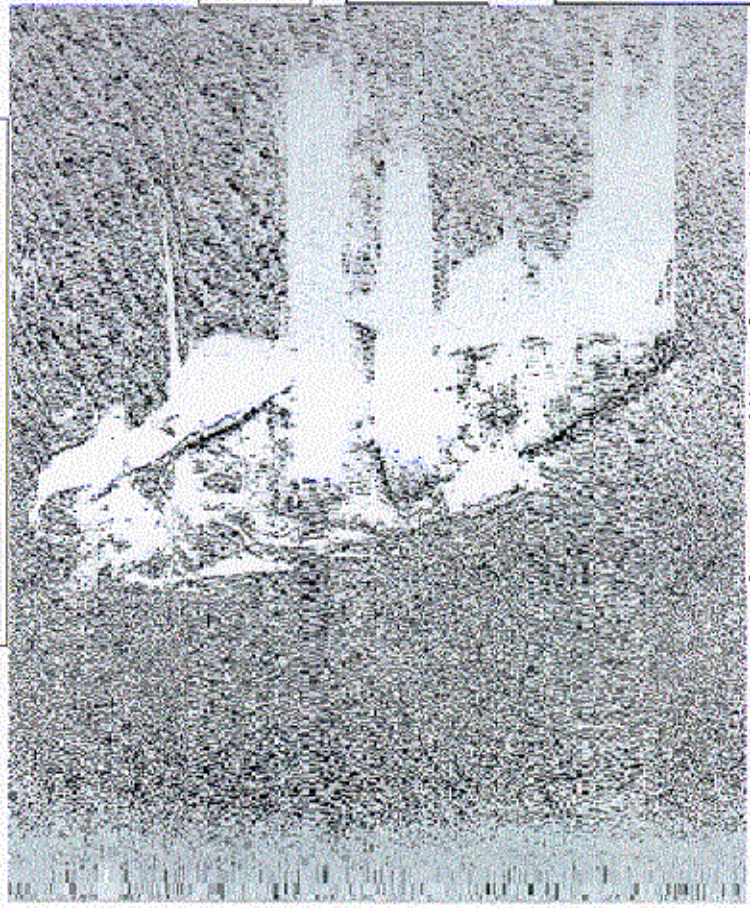
Investigation SWMB

Charting Rec  Chart Item  
Chart 'wreck, least depth known by sounding only, 61'' at surveyed position.

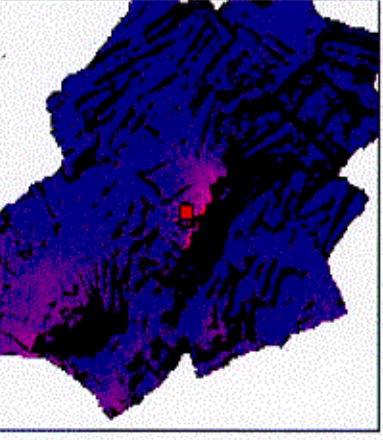
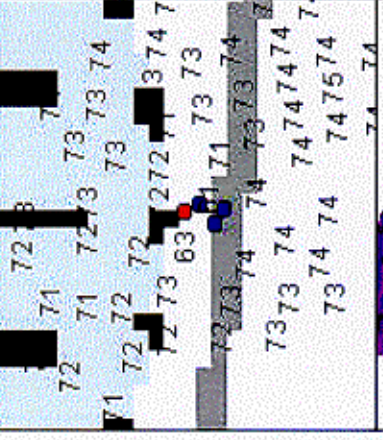
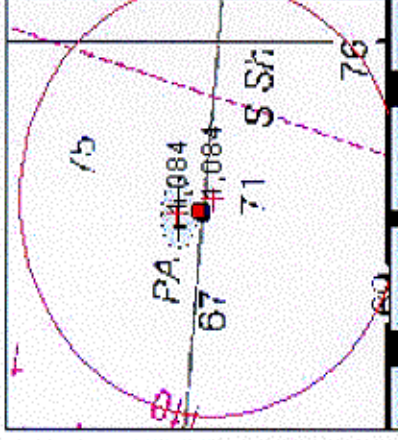
Matching Swath Info

Line Day Fix Range

DTON  
 DTON  
Fixes <Radius  
2  
203 0  
203 0  
203 0  
203 0  
Local Contacts  
304\_106\_1517\_1 7.97  
304\_107\_1529\_1 16.4  
304\_300\_1645\_1 19.4



0 meters width 0 meters height



Resolution

SSS Height 3.8  
Apparent Height 3.55  
Average Depth 22.5  
Top Depth 0  
Length 0  
Width 0

Significance Criteria  
3.8 > 1 m < 20 m or 10 %  
18.7 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact ht  
3.55 > 100 % 3.8  
Multibeam Coverage

Number of Depths is greater than X  
62 > 7

Top Depth is greater than local depth  
18.7 > 19.4

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

Found in F-004SS with side scan sonar.

AWOIS No: 1084

**Item Description:** Wreck NINA located with 200% SSS during WHITING survey F00453 (1999).

**Source:** Shipwrecks of Delaware and Maryland by Gary Gentile, copyright 1990, Gary Gentile Productions, P.O. Box 57137, Philadelphia, PA 19111, F00453

**AWOIS Position:** 38° 30' 30.00" N, 074° 50' 30.00" W

**Required Investigation:** S2, DI, SD

**Radius:** 1000 m

**Charts Affected:** 12214

### INVESTIGATION

*SHEET 3  
CHART 12214*

**Date(s):** July 21, 2000 (DN 203)

**Position Numbers:** HPS Fix # 30465.

**SWMB Data Source:** Fe2000\_18/Aw1084/WH05/2000-203/003\_1851/125/79

**Investigation Used:** SWMB

**Surveyed Position:** 38° 30' 31.79" N, 074° 50' 32.31" W

**Position Determined By:** DGPS

**Investigation Summary:** Contacts 304\_106\_1517\_1, 304\_107\_1529\_1, 304\_300\_1645\_1 and 304\_300\_1627\_1 were identified during F00453 WHITING 1999 survey. These contacts were developed with SWMB during F00467 2000. A contact resembling a wreck with a least depth of 61 ft was identified. *62*

### CHARTING RECOMMENDATION

**Recommendation:** The Hydrographer recommends deleting the charted wreck symbol and charted PA notation at the AWOIS position. Chart a <sup>*dangerous*</sup> wreck symbol with least depth of 61 ft at latitude 38° 30' 31.79" N, longitude 074° 50' 32.31" W. *Concur*

*Delete PA ~~PA~~*

*Add 62 WK*

AWOIS No: 2723

**Item Description:** Located with 200% SSS and VBES developments during WHITING survey F00453 (1999). Wreck THERESA I described by divers to be two wrecks lying side by side (see AWOIS 2724 GRAZE).

**Source:** NM27/67, CL 1167/67. NM 37/67. H10255/87 OPR D219-HFP-86, F00453

**AWOIS Position:** 39° 12' 37.86" N, 075° 15' 15.1 " W

**Required Investigation:** DI

**Radius:** 100 m

**Charts Affected:** 12304

---

**INVESTIGATION**

**Date(s):** September 7, 2000 (DN 251)

*SHEET 8  
CHART 12304*

**Position Numbers:** HPS Fix # 31308

**SWMB Data Source:** Fe2000\_24/WH05/2000-251/023\_1633/308/77

**Investigation Used:** SWMB

**Surveyed Position:** 39° 12' 37.99" N, 075° 15' 14.99" W

**Position Determined By:** DGPS

**Investigation Summary:** 100% SWMB was acquired over two contact areas identified during WHITING F00453 (1999) operations. Contact 238\_047\_1923\_1 resembled a wreck and was found with a least depth of 16 ft. See AWOIS No. 2724 item investigation.

---

**CHARTING RECOMMENDATION**

**Recommendation:** The Hydrographer recommends retaining the charted 15 ft sounding and wrecks notation at the AWOIS position. *Do Not Concure*

*Delete 15 WKS*

*Add 16 WKS*

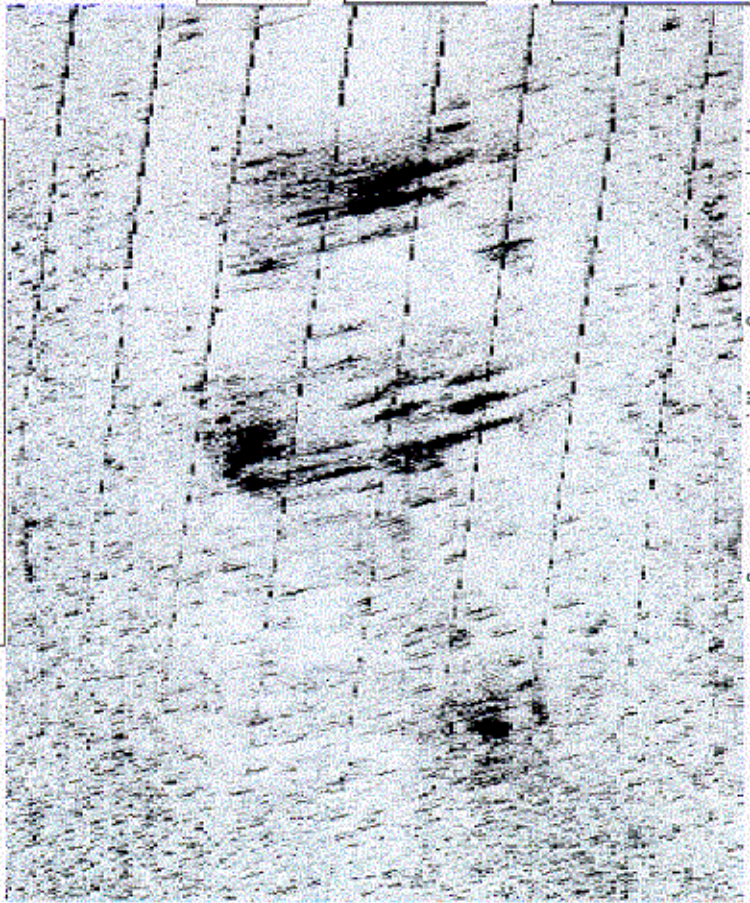
238\_047\_1923\_1  
 Offset 52  
 Shad Len 0  
 Correlating Contact

Correlating Dist 0  
 SSS Height 0  
 Second Hit  
 Con Lat 39-12-38.39 N  
 Con Lon 075-15-15.29 W

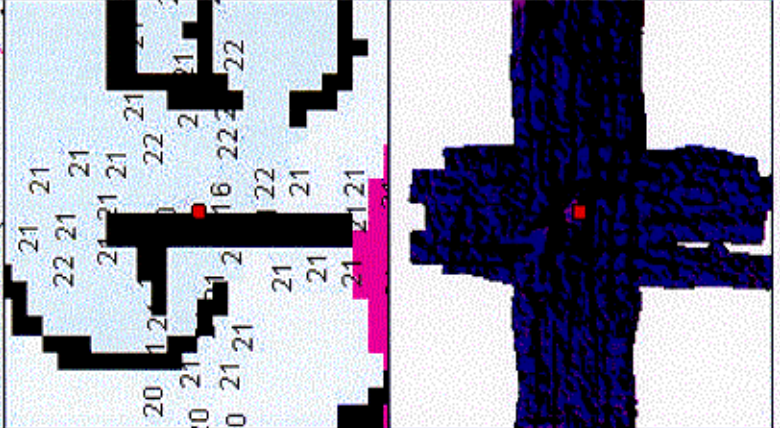
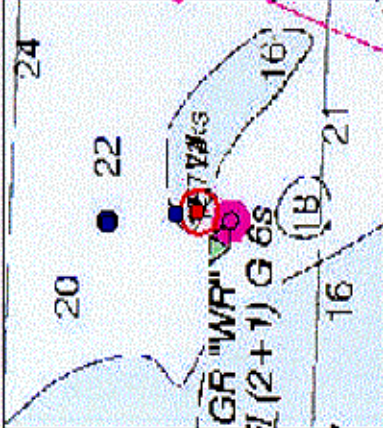
**Development**  
 Least Depth 4.84 m AWOIS# 2723  
 Least Depth 16 ft AWOIS Dist 16.7  
 Day of LD 251 LD Lat 39-12-37.99 N  
 Contact Dist 14.2 LD Lon 075-15-14.99 W  
 LD Source Fe2000\_24\_W1105\_2000-251\_023\_1633\_30

**Comments**  
 Contact Remark  
 Investigation SWMB  
 Charting Rec  
 Chart Item

**Matching Swath Info**  
 Line Day Fix Range



DTON >DTON  
 DTON  
 Fixes <Radius  
 2  
 251 0  
 251 0  
 251 0  
 251 0  
 Local Contacts



**Resolution**  
 SSS Height 0  
 Apparent Height 1.97  
 Average Depth 6.6  
 Top Depth  
 Length 0  
 Width 0  
**Significance Criteria**  
 0 > 1 m < 20 m or 10 %  
 6.6 < 25  
 Both Criteria must be red for Auto-Signify

Auto-Signify Significant   
**Resolution Criteria**  
 Relief is greater than X% of contact fit  
 1.97 > 100 % 0  
 Multibeam Coverage   
 Number of Depths is greater than X  
 39 > 7  
 Top Depth is greater than local depth  
 6.6 > 6.1  
 Any green means resolved

Auto-Resolve Resolved   
**Resolution Notes**  
 wreck found

AWOIS No: 2724

**Item Description:** Oyster boat WALTER GRAZE sunk in 22 ft of water. Described by divers to be two wrecks lying side by side (see AWOIS item 2723 THERESA I). Located with 200% SSS and VBES developments during WHITING survey F00453 1999.

**Source:** NM27/67, CL1167/67, NM37/67. H10255/87 OPR D219-HFP-86, F00453

**AWOIS Position:** 39° 12' 37.45" N, 075° 15' 16.42" W

**Required Investigation:** DI

**Radius:** 100 m

**Charts Affected:** 12304

---

**INVESTIGATION**

**Date(s):** September 7, 2000 (DN 251)

*SHEET 8  
CHART 12304*

**Position Numbers:** HPS Fix # 30479.

**SWMB Data Source:** Fe2000\_24/WH05/2000-251/003\_1601/494/50

**Investigation Used:** SWMB

**Surveyed Position:** 39° 12' 53.40" N, 075° 15' 17.04" W

**Position Determined By:** DGPS

**Investigation Summary:** 100% SWMB was acquired over two contact areas identified during F00435 WHITING 1999 operations. Contact 238\_042\_2036\_1 resembled a wreck and was found to have a least depth of 14 ft. See <sup>\*</sup>AWOIS 2723 investigation. This item was submitted as a Danger to Navigation (#2), dated March 14, 2001.

*\* AWOIS 2723 is LOCATED APPROX. 475 meters SOUTH OF AWOIS 2724*

**CHARTING RECOMMENDATION**

**Recommendation:** The Hydrographer recommends charting a wreck with least depth of 14 ft at latitude 39° 12' 53.40" N, longitude 075° 15' 17.04" W. *Concur*

*Add 14' wk*

238\_042\_2036\_1

Offset -13  
Shad Len 0  
Correlating Contact  
238\_050\_2010\_1

Correlating Dist  
7.2

SSS Height 1.4

Second Hit  
Con Lat 39-12-53.46 N  
Con Lon 075-15-17.37 W

Development

Least Depth 4.37 m AWOIS# 0  
Least Depth 14 ft AWOIS Dist 0  
Day of LD 251 LD Lat 39-12-53.4 N  
Contact Dist 8.1 LD Lon 075-15-17.04 W  
LD Source Fe2000 24 W105\_2000-251\_003\_1601\_49

Comments

Contact Remark 0, +DEV hyd good hard hit in search

Investigation SWMB

Charting Rec

Chart Item  W/RK  
chart "Wreck, least depth known by sounding only, 14" at surveyed position.

Matching Swath Info

Line Day Fix Range

VM



0 meters width 0 meters height

-DTON >DTON

DTON

3 Wreck

Fixes <Radius

251 0  
251 0  
251 0  
251 0  
251 0

Local Contacts

230\_019\_1824\_1 15.2  
230\_020\_1846\_3 14.9  
238\_043\_2045\_1 24.5  
238\_044\_2049\_1 12.4  
238\_044\_2053\_1 22.3  
238\_044\_2056\_1 17.0  
238\_050\_2010\_1 7.23

Resolution

SSS Height 1.4  
Apparent Height 2.21  
Average Depth 6.5  
Top Depth 0  
Length 0  
Width 0

Significance Criteria

1.4 > 1 m < 20 m or 10 %  
5.1 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify

Significant

Resolution Criteria

Relief is greater than X% of contact ht.

2.21 > 100 % 1.4

Multibeam Coverage

Number of Depths is greater than X

29 > 7

Top Depth is greater than local depth

5.1 > 5.1

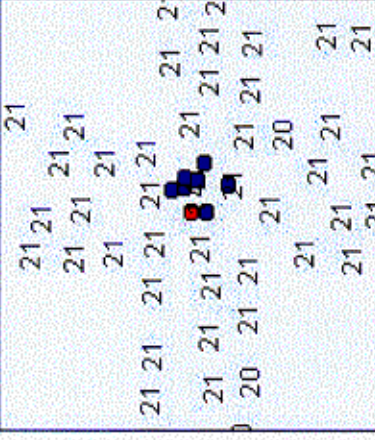
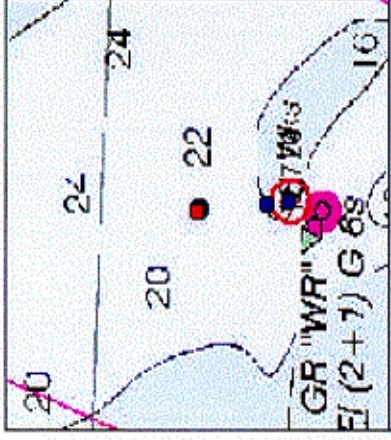
Any green means resolved

Auto-Resolve

Resolved

Resolution Notes

wreck found



AWOIS No: 8132

**Item Description:** Wreck of the SARA LARANCE (sic) reported to have sunk on Hen and Chicken Shoal. Reported cargo of coal at time of sinking. Wreck is broken up and scattered.

**Source:** CL208/85, Notebook on Shipwrecks Maryland Delaware Coast, H. Richard Moale, Copyright 1990, Family Line Publications. Captain David Potter, Pilots Association for Bay and River Delaware, confirms name and location.

**AWOIS Position:** 38° 44' 40.00" N, 075° 03' 06.00" W

**Required Investigation:** Unassigned

**Radius:** 1600 m

**Charts Affected:** 12214, 12216

### INVESTIGATION

**Date(s):** July 20, 22-24, August 12, September 15, 2000 (DN 201, 203-205, 224, 258)

**Position Numbers:** None

**Investigation Used:** S2, SWMB, DI

**Surveyed Position:** None

**Position Determined By:** DGPS

**Investigation Summary:** AWOIS 8132 was investigated with 200% side scan sonar. Thirteen contacts were found and investigated with SWMB. Of those thirteen, two contacts resembled possible wreckage and were investigated by divers. Divers found no wreckage at either site. Further investigation with local sources reveal the AWOIS position is in error and that the LORAN TD's for the wreck are reported at 27138.9 and 42611.8, which corresponds to a position of Lat. 38°45'43" N Lon. 75°03'54" W. This new position places the wreck on the shoalest portion of Hen and Chicken Shoal, outside the assigned radius. Launch operations in this area were deemed unsafe.

### CHARTING RECOMMENDATION

*SEE ALSO THE EVALUATION REPORT*

**Recommendation:** The Hydrographer recommends charting surveyed soundings. *CONCUR WITH CLARIFICATION*

204\_213\_1936\_1

Offset 43  
Shad Len 0  
Correlating Contact

Correlating Dist 0

SSS Height 0.6

Second Hit

Con Lat 38-44-47.3 N

Con Lon 075-03-42.93 W

Development

Least Depth 11.7 m AWOIS# 8132  
Least Depth 38 f AWOIS Dist 917.6  
Day of LD 224 LD Lat 38-44-47.27 N  
Contact Dist 1.7 LD Lon 075-03-42.98 W  
LD Source Fe2000\_16\_Aw8132

Comments

Contact Remark 0, contact-small shadow possible pi  
Investigation S2, SWMB

Charting Rec The Hydrographer recommends

Chart Item charting representative soundings.

Matching Swath Info

Line Day Fix Range  
119 203 21857-21935  
213 204 23157-23254

VM

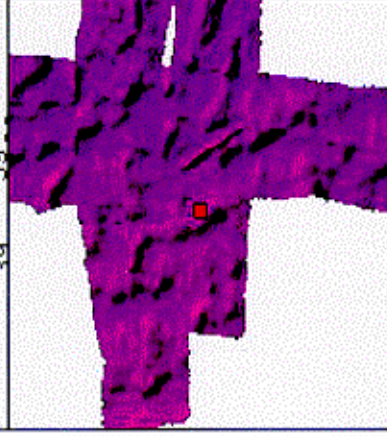
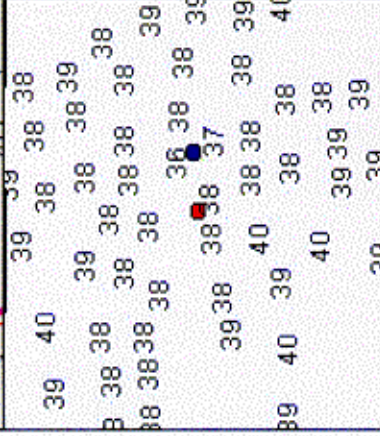
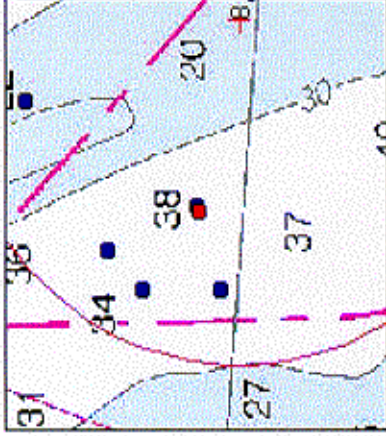
DTON >DTON

DTON

Fixes <Radius

224 24550  
224 24552  
224 24560  
224 24561  
224 24562

Local Contacts



Resolution

SSS Height 0.6  
Apparent Height 0.5  
Average Depth 11.9  
Top Depth  
Length 0  
Width 0

Significance Criteria

0.6 > 1 m < 20 m or 10 %  
11.3 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact ht.

0.5 > 100 % 0.6

Multibeam Coverage

Number of Depths is greater than X

42 > 7

Top Depth is greater than local depth

11.3 > 11.1

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

200% side scan sonar coverage was attained. Significant contacts were



204\_122\_1518\_2

Offser 16  
Shad Len 0  
Correlating Contact

Correlating Dist 0

SSS Height 0.7

Second Hit  
Con Lat 38-44-43.53 N  
Con Lon 075-03-57.48 W

Development

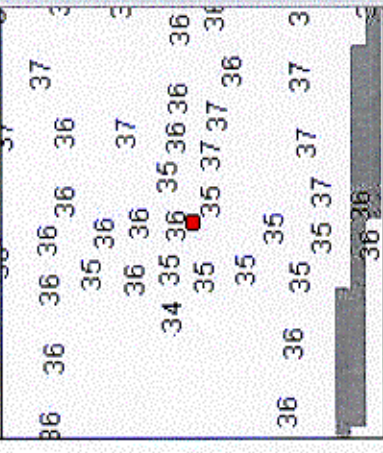
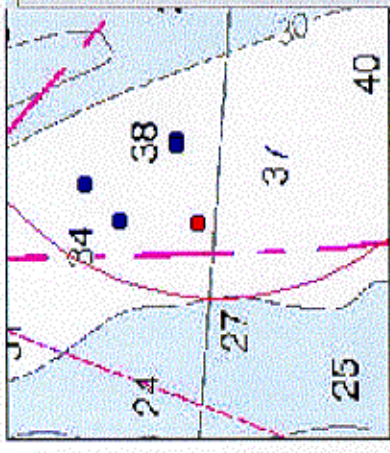
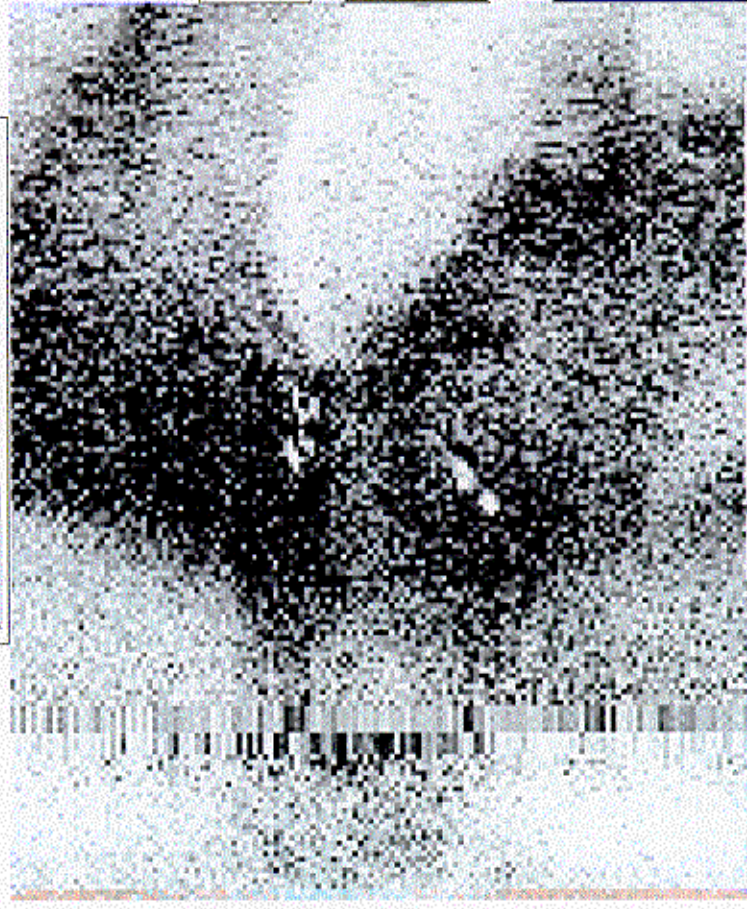
Least Depth 10.7 m AWOIS# 8132  
Least Depth 35 ft AWOIS Dist 1244.6  
Day of I.D. 224 LD Lat 38-44-43.75 N  
Contact Dist 12.8 LD Lon 075-03-57.93 W  
LD Source Fe2000\_16\_Aw8132

Comments

Contact Remark 0, small contact, nothing found  
Investigation S2, SWMB, DI  
Charting Rec The Hydrographer recommends charting representative soundings.  
 Chart Item

Matching Swath Info

Line Day Fix Range  
122 204 22100-22154  
212 204 23255-23348



Resolution

SSS Height	0.7
Apparent Height	0.5
Average Depth	11.1
Top Depth	0
Length	0
Width	0

Significance Criteria

> 1 m	< 20 m or	10 %
0.7	< 25	

Both Criteria must be red for Auto-Signify

Auto-Signify    Significant

Resolution Criteria

Relief is greater than X% of contact ht

0.5	>	100 %	0.7
-----	---	-------	-----

Multibeam Coverage

Number of Depths is greater than X

58	>	7
----	---	---

Top Depth is greater than local depth

10.4	>	10.6
------	---	------

Any green means resolved

Auto-Resolve    Resolved

Resolution Notes

200% side scan coverage was attained. Significant contacts were

-DTON  DTON  DTON

Fixes <Radius

224 23397
224 23399
224 23404
224 23410
224 23411

Local Contacts

--

204\_122\_1518\_1

Offset 20  
Shad Len 0  
Correlating Contact

Correlating Dist 0

SSS Height 0.9

Second Hit  
Con Lat 38-44-56.82 N  
Con Lon 075-03-57.45 W

Development

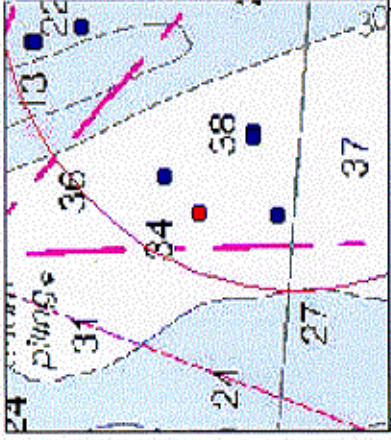
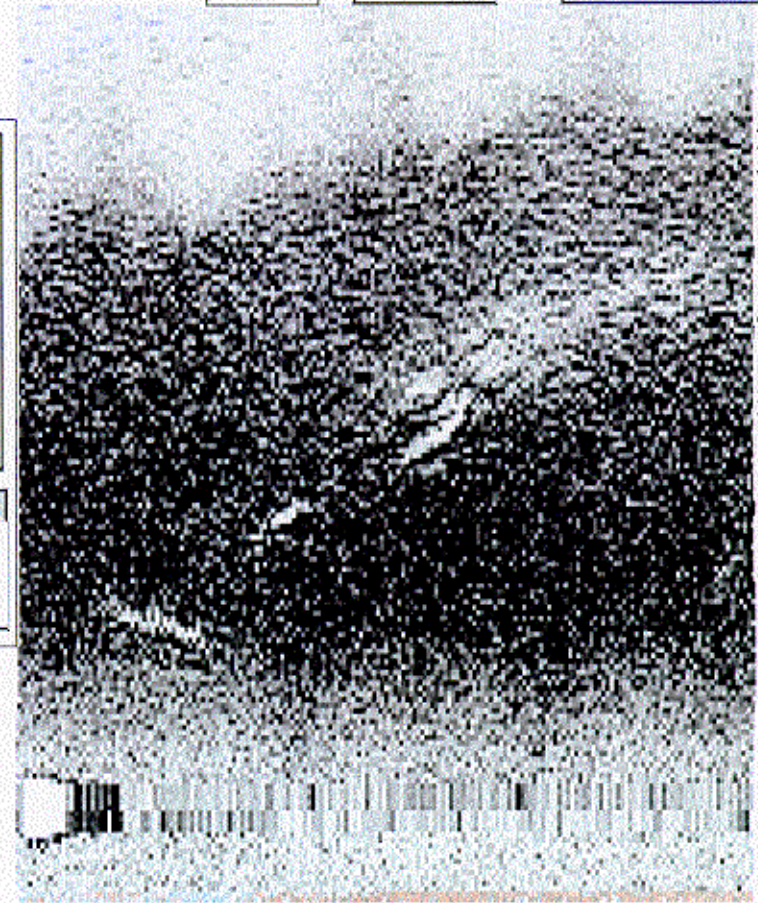
Least Depth 10.6 m AWOIS# 8132  
Least Depth 34 ft AWOIS Dist 1343.7  
Day of LD 224 LD Lat 38-44-56.85 N  
Contact Dist 13.5 LD Lon 075-03-58.01 W  
LD Source Fe2000\_16\_Aw8132

Comments

Contact Remark 0, large area of debris  
Investigation S2, SWMB  
Charting Rec The Hydrographer recommends charting representative soundings.  
 Chart Item

Matching Swath Info

Line	Day	Fix Range
122	204	22100-22154
25	204	22678-22699
216	204	22876-22967



37	38	3
36	35	3
36	36	3
35	35	3
35	37	3
34	34	3
35	35	3
35	36	3
35	37	3
35	36	3
35	37	3
34	35	3
35	36	3
35	37	3



Resolution

SSS Height 0.9  
Apparent Height 0.8  
Average Depth 11  
Top Depth 0  
Length 0  
Width 0

Significance Criteria  
0.9 > 1 m < 20 m or 10 %  
10.1 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact ht  
0.8 > 100 % 0.9

Multibeam Coverage

Number of Depths is greater than X  
121 > 7

Top Depth is greater than local depth  
10.1 > 10.4

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

200% side scan coverage was attained. Significant contacts were

204\_115\_1549\_2

Offset 37  
Shad Len 0  
Correlating Contact

Correlating Dist 0

SSS Height 0.5

Second Hit  
Con Lat 38-45-16.55 N  
Con Lon 075-03-21.82 W

**Development**  
Least Depth 5.9 m AWOIS# 8132  
Least Depth 19 ft AWOIS Dist 1192  
Day of FLD 224 LD Lat 38-45-16.5 N  
Contact Dist 2.3 LD Lon 075-03-21.89 W  
LD Source F62000\_16\_Aw8132

**Comments**  
Contact Remark 0, Possible debris or scour, nothing f  
Investigation S2, SWMBE, DI

**Charting Rec**  
 Chart Item  
The Hydrographer recommends charting representative soundings.

**Matching Swath Info**

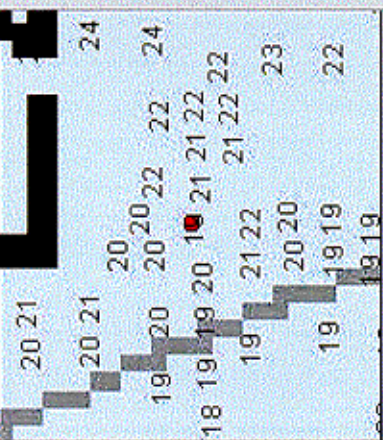
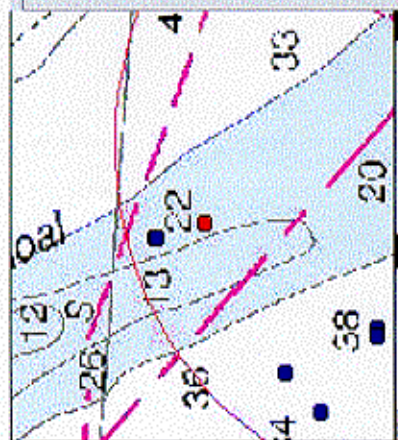
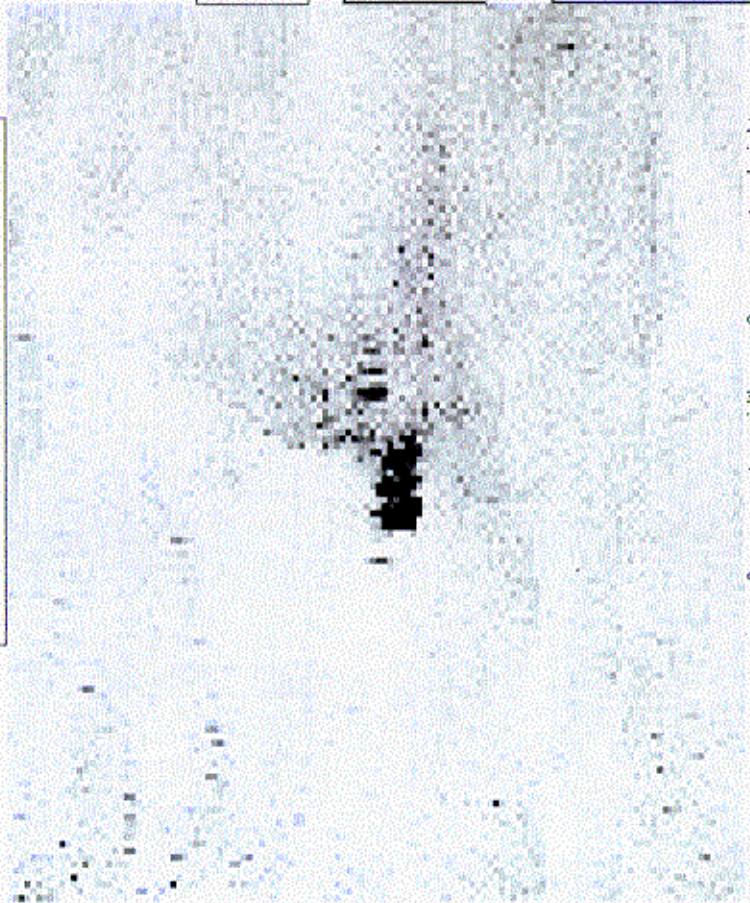
Line	Day	Fix Range
115	201	20631-20734
115	201	20735-20758
115	204	22197-22289
221	204	23545-23598

VM

DTON  
 DTON  
DTON

Fixes <Radius  
224 28917  
224 28918  
224 28919  
224 28921  
224 28929

Local Contacts



**Resolution**  
SSS Height 0.5  
Apparent Height 1.5  
Average Depth 6.3  
Top Depth  
Length 0  
Width 0

**Significance Criteria**  
0.5 > 1 m < 20 m or 10 %  
5.8 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

**Resolution Criteria**  
Relief is greater than X% of contact ht  
1.5 > 100 % 0.5  
Multibeam Coverage   
Number of Depths is greater than X  
67 > 7  
Top Depth is greater than local depth  
5.8 > 5.5  
Any green means resolved

Auto-Resolve Resolved

**Resolution Notes**  
200% side scan coverage was attained. Significant contacts were

204\_115\_1549\_1

Offset -31  
Shad Len 0  
Correlating Contact

205\_223\_1341\_2

Correlating Dist 15.4

SSS Height 1.3

Second Hit

Con Lat 38-45-24.67 N

Con Lon 075-03-24.6 W

Development

Least Depth 6.2 m AWOIS# 8132  
Least Depth 20 ft AWOIS Dist 1078.4  
Day of LD 224 LD Lat 38-45-25.13 N  
Contact Dist 14.8 LD Lon 075-03-24.78 W  
LD Source Fe2000\_16\_Aw8132

Comments

Contact Remark 0, possible wreck or scour  
Investigation S2, SWMB  
Charting Rec The Hydrographer recommends charting representative soundings.  
 Chart Item

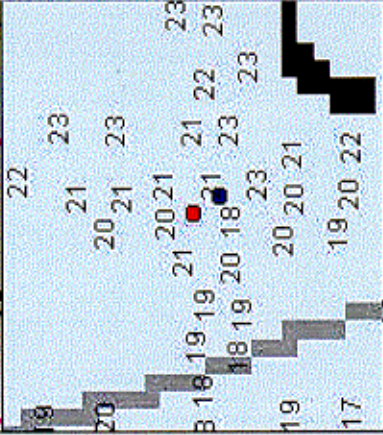
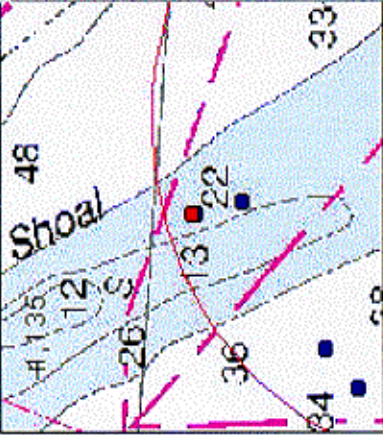
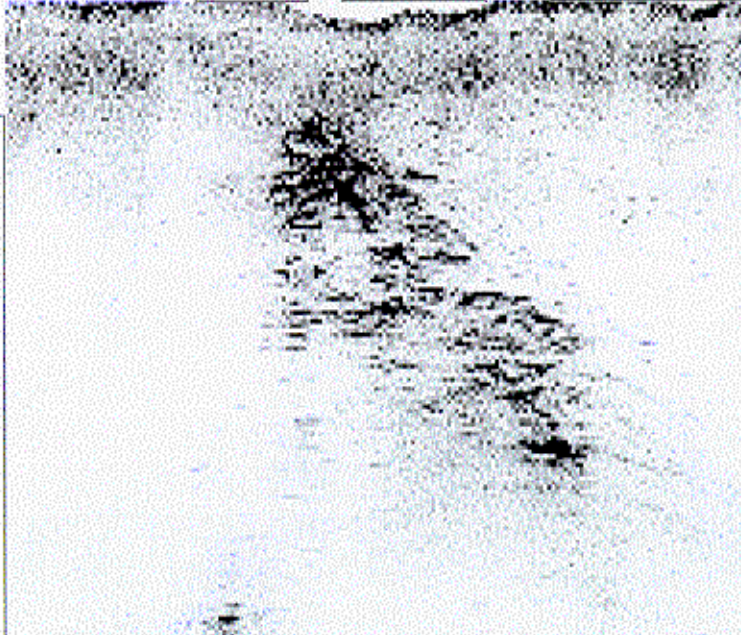
Matching Swath Info

Line Day Fix Range  
115 201 20631-20734 VM  
115 201 20735-20758  
115 204 22197-22289  
223 205 23707-23749

DTON  
 DTON  
Fixes <Radius

224 29412  
224 29413  
224 29414  
224 29415  
224 29416

Local Contacts  
205\_223\_1341\_2 15.3



Resolution  
SSS Height 1.3  
Apparent Height 1.1  
Average Depth 6.6  
Top Depth  
Length 0  
Width 0

Significance Criteria  
1.3 > 1 m < 20 m or 10 %  
5.3 < 25  
Both Criteria must be red for Auto-Signify

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact ht.  
1.1 > 100 % 1.3  
Multibeam Coverage   
Number of Depths is greater than X  
99 > 7  
Top Depth is greater than local depth  
5.3 > 5.5  
Any green means resolved

Auto-Resolve Resolved

Resolution Notes

200% side scan coverage was attained. Significant contacts were

203\_119\_1859\_1

Offset -39  
Shad Len 0  
Correlating Contact

Correlating Dist 0

SSS Height 0.7

Second Hit  
Con Lat 38-44-47.36 N  
Con Lon 075-03-41.78 W

Development

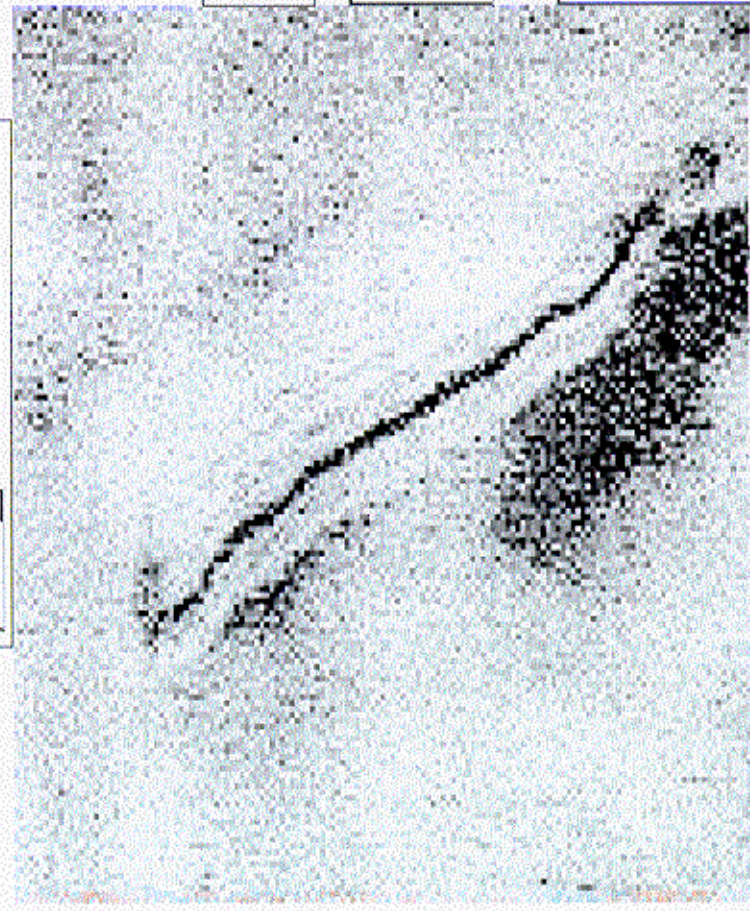
Least Depth 11.1 m AWOIS# 8132  
Least Depth 36 ft AWOIS Dist 891.4  
Day of LD 224 LD Lat 38-44-47.61 N  
Contact Dist 9.2 LD Lon 075-03-41.99 W  
LD Source Fe2000\_16\_Aw8132

Comments

Contact Remark 0, unknown contact  
Investigation S2, SWMB  
Charting Rec The Hydrographer recommends charting representative soundings.  
 Chart Item

Matching Swath Info

Line Day Fix Range  
119 203 21857-21935  
213 204 23157-23254



0 meters width 0 meters height

DTON  
 DTON  
Fixes <Radius

224 24134  
224 24137  
224 24146  
224 24149  
224 24158

Local Contacts

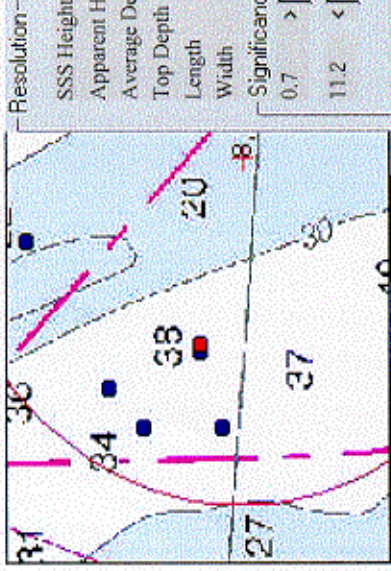
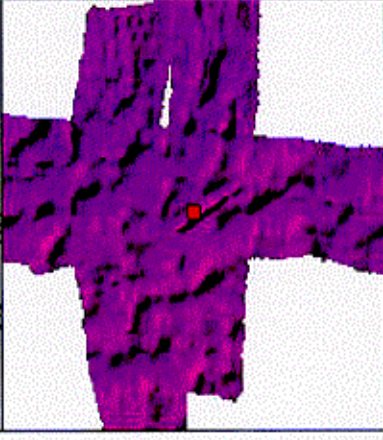


Table of depth soundings:

40	39	38	38	38	40
38	39	38	38	38	39
38	38	38	38	38	38
38	38	38	36	38	38
39	38	38	37	38	39
40	40	38	38	38	39
40	39	38	38	38	40
40	40	39	39	39	40



Resolution

SSS Height 0.7  
Apparent Height 1  
Average Depth 11.9  
Top Depth 0  
Length 0  
Width 0

Significance Criteria

0.7 > 1 m < 20 m or 10 %  
11.2 < 25  
Both Criteria must be red for Auto-Signify

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact hit  
1 > 100 % 0.7  
Multibeam Coverage   
Number of Depths is greater than X  
109 > 7  
Top Depth is greater than local depth  
11.2 > 11.5  
Any green means resolved

Auto-Resolve Resolved

Resolution Notes

200% side scan sonar coverage was attained. Significant contacts were

**AWOIS No:** 8402 (same as AWOIS No. 9291)

**Item Description:** Wreck (unknown name) located with 200% SSS during WHITING surveys H10446 (1992) and H10476 (1993). Both AWOIS 8402 and 9291 are given with identical positions.

**Source:** AWOIS 8402: H10446/92, OPR-D368-WH & AWOIS 9291: H10476/93, OPR-D368-WH

**AWOIS Position:** 38° 44' 47.<sup>37</sup>49" N, 074° 57' 32.<sup>44</sup>43" W

**Required Investigation:** S2, DI, SD

**Radius:** 100 m

**Charts Affected:** 12214

---

**INVESTIGATION**

*SHEET 11*  
*CHART 12214*

**Date(s):** September 8, 2000 (DN 252)

**Position Numbers:** HPS Fix # 34363.

**SWMB Data Source:** Fe2000\_25/WH05/2000-252/019\_1802/231/22

**Investigation Used:** SWMB

**Surveyed Position:** 38° 44' 47.49" N, 74°57' 32.43" W

**Position Determined By:** DGPS

**Investigation Summary:** Complete SWMB coverage was acquired over AWOIS 8402 (AWOIS 9291). A contact resembling a wreck with least depth of 56 ft was identified.

---

**CHARTING RECOMMENDATION**

**Recommendation:** The Hydrographer recommends deleting the charted wreck symbol with least depth of 55 ft at the AWOIS position. Chart a wreck symbol with least depth of 56 ft at latitude 38° 44' 47.49" N, longitude 74° 57' 32.43" W. *concur*

*Delete 55 Wk*

*Add 56 Wk*

reference\_point3

Offset 0  
Shad Len 0  
Correlating Contact

Correlating Dist 0  
SSS Height 0

Second Hit  
Con Lat 38-44-47.83 N  
Con Lon 074-57-32.52 W

**Development**  
Least Depth 17.21 m AWOIS# 9291  
Least Depth 56 ft AWOIS Dist 12.8  
Day of LD 252 LD Lat 38-44-47.49 N  
Contact Dist 10.6 LD Lon 074-57-32.43 W  
LD Source Fe2000\_25 WH05\_2000-252\_019\_1802\_23

**Comments**  
Contact Remark 0, second contact development (25)  
Investigation SWMB  
Charting Rec Chart "obstruction, least depth known by sounding only, 56" at surveyed position.  
 Chart Item

Matching Swath Info  
Line Day Fix Range

VM

DTON >DTON  
 DTON

Fixes <Radius  
2 252.0  
252.0  
252.0  
252.0

Local Contacts

0 meters width 0 meters height

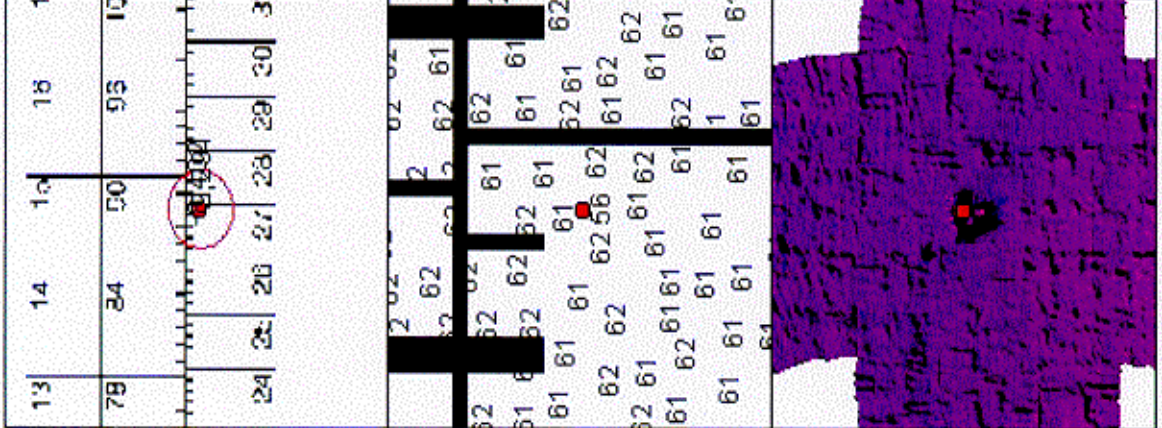
**Resolution**  
SSS Height 0  
Apparent Height 2.12  
Average Depth 18.9  
Top Depth 0  
Length 0  
Width 0  
Significance Criteria  
0 > 1 m < 20 m or 10 %  
18.9 < 25  
Both Criteria must be met for Auto-Signify

Auto-Signify Significant

**Resolution Criteria**  
Relief is greater than X% of contact ht  
2.12 > 100 % 0  
Multibeam Coverage   
Number of Depths is greater than X  
53 > 7  
Top Depth is greater than local depth  
18.9 > 18.7  
Any green means resolved

Auto-Resolve Resolved

Resolution Notes  
Investigation at request of pilots Association.



AWOIS No: 8975

**Item Description:** Wreck (unknown name) located with SSS during WHITING survey H10446 (1993).

**Source:** H10446/92-93 OPR D368-WH

**AWOIS Position:** 38° 46' 24.20" N , 074° 58' 40.20" W

**Required Investigation:** SD, S2, SWMB, D1

**Radius:** 100 m

**Charts Affected:** 12304, 12214

### INVESTIGATION

**Date(s):** September 8, 2000 (DN 252)

*SHEET 10*

**Position Numbers:** HPS Fix # 30218.

*CHARTS 12214  
12304*

**SWMB Data Source:** Fe2000\_25/WH05/2000-252/006\_1614/299/51

**Investigation Used:** SWMB

**Surveyed Position:** 38° 46' 24.<sup>11</sup>/~~22~~" N, 074° 58' 40.<sup>50</sup>/~~45~~" W

**Position Determined By:** DGPS

**Investigation Summary:** Complete SWMB coverage over the assigned radius. A contact resembling a wreck was located with a least depth of 57 ft.

### CHARTING RECOMMENDATION

**Recommendation:** The Hydrographer recommends deleting the charted wreck symbol at the AWOIS position. Chart a wreck symbol with least depth of 57 ft at latitude 38° 46' 24.<sup>11</sup>/~~22~~" N, longitude 074° 58' 40.<sup>50</sup>/~~45~~" W. *CONCUR*

*Delete (SS) wk*

*Add (57) wk*



reference\_point2

Offset 0  
Shad Len 0  
Correlating Contact

Correlating Dist 0

SSS Height 0

Second Ht  
Con Lat 38-46-24.2 N  
Con Lon 074-58-40.02 W

**Development**  
Least Depth 17.47 m AWOIS# 8975  
Least Depth 57 ft AWOIS Dist 6.2  
Day of LD 252 LD Lat 38-46-24.22 N  
Contact Dist 10.4 LD Lon 074-58-40.45 W  
LD Source Fe2000\_25\_WHO5\_2000-252\_006\_1614\_29

**Comments**  
Contact Remark 0, contact development (25)  
Investigation SWMB

Charting Rec  
 Chart Item  
Chart "obstruction, least depth known by sounding only, 57" at surveyed position.

Matching Swath Info  
Line Day Fix Range

VM

DTON  
 DTON  
Fixes <-Radius

2  
252.0  
252.0  
252.0  
252.0

Local Contacts

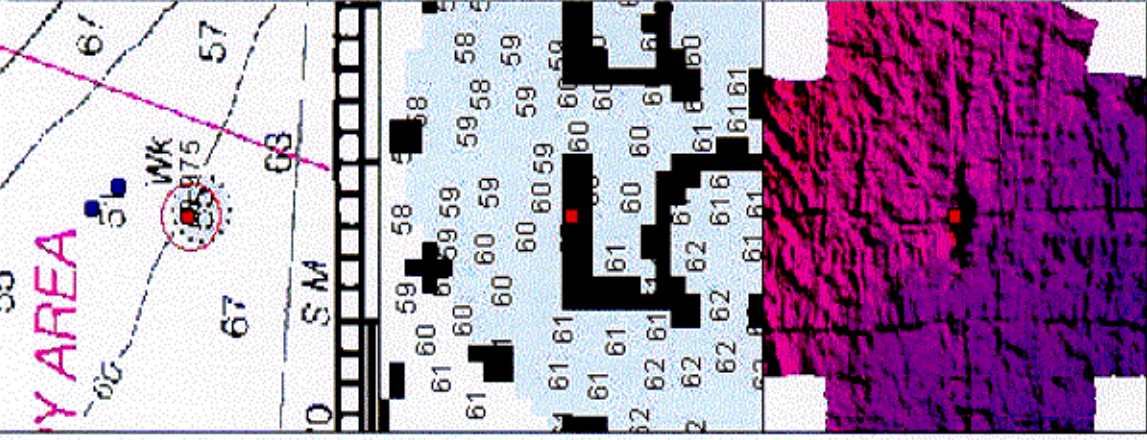
**Resolution**  
SSS Height 0  
Apparent Height 1.23  
Average Depth 18.5  
Top Depth  
Length 0  
Width 0  
Significance Criteria  
0 > 1 m < 20 m or 10 %  
18.5 < 25  
Both Criteria must be red for Auto-Signify

Auto-Signify Significant

**Resolution Criteria**  
Relief is greater than X% of contact ht. 1.23 > 100 % 0  
Multibeam Coverage   
Number of Depths is greater than X 40 > 7  
Top Depth is greater than local depth 18.5 > 17.7  
Any green means resolved

Auto-Resolve Resolved

Resolution Notes



0 meters width 0 meters height

AWOIS No: 9935

**Item Description:** Wreck STAR DUST located with 200% SSS and VBES development during WHITING survey H10917 (1999).

**Source:** LNM 14/92, D392-WH, H10917

**AWOIS Position:** 38° 50' 12.00" N, 075° 04' 06.00" W

**Required Investigation:** S2, DI, SD

**Radius:** 1000 m

**Charts Affected:** 12216,12214,12304

### INVESTIGATION

*SHEET 1*

**Date(s):** September 8, 2000 (DN 252)

*CHARTS 12214  
12216  
12304*

**Position Numbers:** HPS Fix # 31497.

**SWMB Data Source:** Fe2000\_1A/WH05/2000-252/033\_1422/202/13

**Investigation Used:** SWMB

**Surveyed Position:** 38° 50' 38.5" N, 075° 04' 30.83" W

**Position Determined By:** DGPS

**Investigation Summary:** Contacts 238\_039\_2044\_1, 217\_061\_1443\_1, 217\_059\_1348\_2, 215\_060\_2120\_1 and 215\_062\_2028\_2 were identified using 200% SSS during WHITING survey H10917 (1999). During F00467, these contacts were developed with SWMB. A contact resembling a wreck with least depth of <sup>101</sup>102 ft was identified just inside of the AWOIS search radius, approximately 1000 m from the charted position.

### CHARTING RECOMMENDATION

**Recommendation:** The Hydrographer recommends deleting the charted wreck symbol and PA notation at the AWOIS position. Chart a wreck symbol with a least depth of 102 ft at latitude 38° 50' 38.5" N, longitude 075° 04' 30.83" W. *\*concur w/ clarification*

*\* SEE ALSO THE  
EVALUATION REPORT*

25

*Delete PA ~~102~~*

*Add 101 WK*

*(No Reference in  
Eval. Rep... SSV 3/1/02)*

215\_060\_2120\_1

Offset -34

Shad Len 0

Correlating Contact

217\_061\_1443\_1

Correlating Dist

8

SSS Height 8

Second Hit

Con Lat 38-50-38.12 N

Con Lon -075-04-30.71 W

**Development**

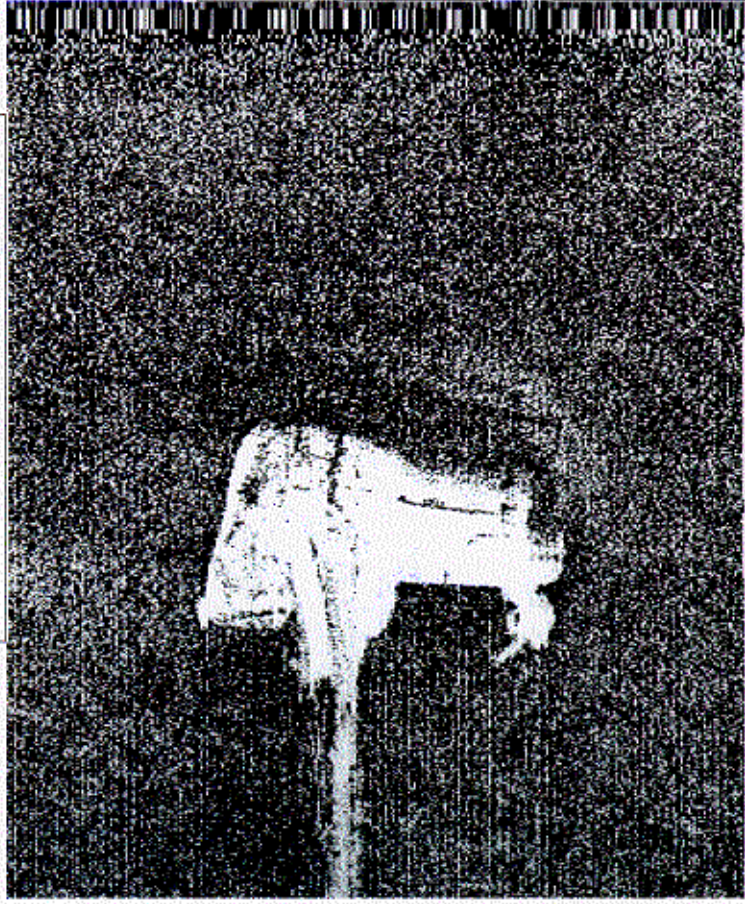
Least Depth 31.02 m AWOIS# 9935  
 Least Depth 101 ft AWOIS Dist 0  
 Day of LD 252 LD Lat 38-50-38.5 N  
 Contact Dist 12 LD Lon 075-04-30.83 W  
 LD Source Fe2000\_1\_A\_WHO5\_2000-252\_033\_1422\_2

**Comments**

Contact Remark 0, +DEV HYDRO DIVE wreck-good  
 Investigation SWMB  
 Charting Rec chart "wreck, not a danger to surface navigation" at surveyed position.  
 Chart Item

**Matching Swath Info**

Line Day Fix Range



0 100 meters width

0 100 meters height

**Resolution**

SSS Height 8  
 Apparent Height 14.64  
 Average Depth 45.1  
 Top Depth  
 Length 0  
 Width 0

**Significance Criteria**

8 > 1 m < 20 m or 10 %  
 37.1 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

**Resolution Criteria**

Relief is greater than X% of contact ht

14.64 > 100 % 8

Multibeam Coverage

Number of Depths is greater than X

77 > 7

Top Depth is greater than local depth

37.1 > 39.5

Any green means resolved

Auto-Resolve Resolved

**Resolution Notes**

Found in H-10917 with side scan and vbes developments. Least depth of 102.4 ft

VM

DTON -> DTON  
 DTON  
 Fixes < Radius

2  
 252 0  
 252 0  
 252 0  
 252 0

Local Contacts

217\_061\_1443\_1 7.95  
 238\_039\_2044\_1 20.7  
 51396.0 14.2457

215\_062\_2028\_2

Offset -66  
Shad Len 0  
Correlating Contact

Correlating Dist 0

SSS Height 1.2

Second Hit  
Con Lat 38-50-37.25 N  
Con Lon 075-04-33.06 W

Development

Least Depth 44.82 m AWOIS# 0  
Least Depth 147 ft AWOIS Dist 0  
Day of LD 252 LD Lat 38-50-37.01 N  
Contact Dist 14.3 LD Lon 075-04-32.55 W  
LD Source F62000\_1\_A\_WH05\_2000-252\_031\_1440\_1

Comments

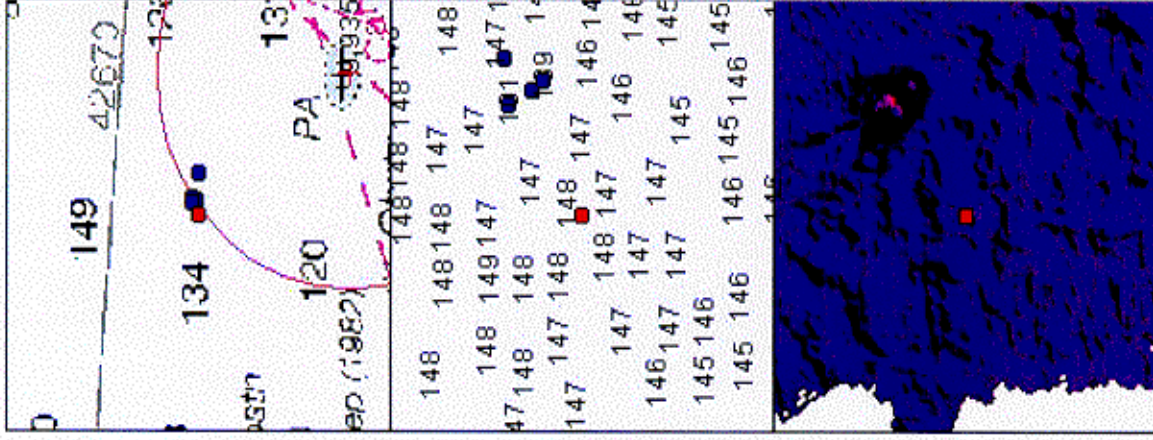
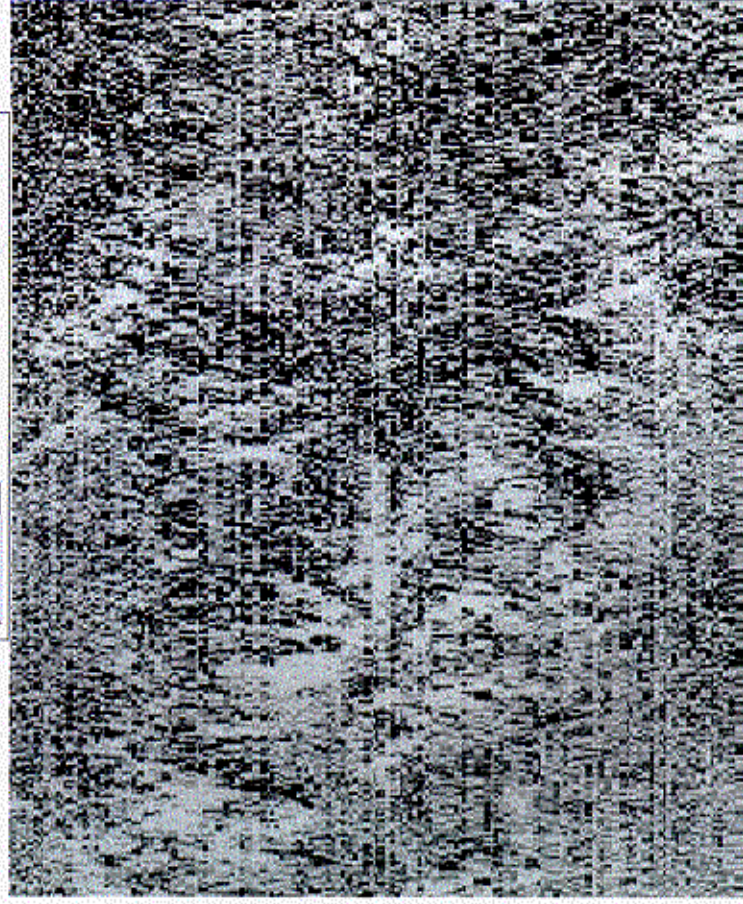
Contact Remark 0, INSIG @ 20PLUS Small good sh  
Investigation SWMB

Charting Rec

Chart Item

Chart representative soundings.

Matching Swath Info  
Line Day Fix Range



Resolution

SSS Height 1.2  
Apparent Height 0.9  
Average Depth 44.9  
Top Depth  
Length 0  
Width 0

Significance Criteria

1.2 > 1 m < 20 m or 10 %  
43.7 < 25  
Both Criteria must be red for Auto-Signify

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact ht.  
0.9 > 100 % 1.2  
Multibeam Coverage   
Number of Depths is greater than X  
68 > 7  
Top Depth is greater than local depth  
43.7 > 31  
Any green means resolved

Auto-Resolve Resolved

Resolution Notes

Insignificant debris near surveyed wreck.

217\_059\_1348\_2

Offset 17  
Shad Len 0  
Correlating Contact

Correlating Dist 0

SSS Height 5.6

Second Hit

Con Lat 38-50-37.32 N

Con Lon 075-04-25.33 W

Development

Least Depth 44.62 m AWOIS# 9935  
Least Depth 146 ft AWOIS Dist 909.6  
Day of LD 252 LD Lat 38-50-37.71 N  
Contact Dist 13 LD Lon 075-04-25.51 W  
LD Source Fe2000\_1\_A\_WHO5\_2000-252\_034\_1449\_2

Comments

Contact Remark 0, NOT FOUND Big shadow weak

Investigation S2

Charting Rec

Chart Iterr

Chart representative soundings.

Matching Swath Info

Line Day Fix Range

VM

DTON

DTON

Fixes <-Radius

252.0

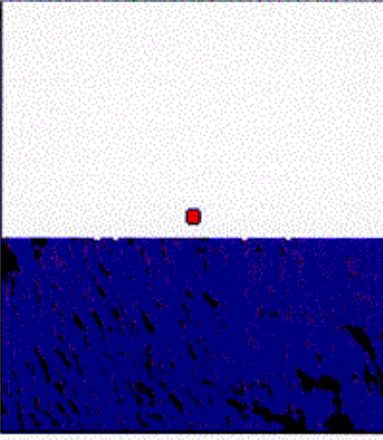
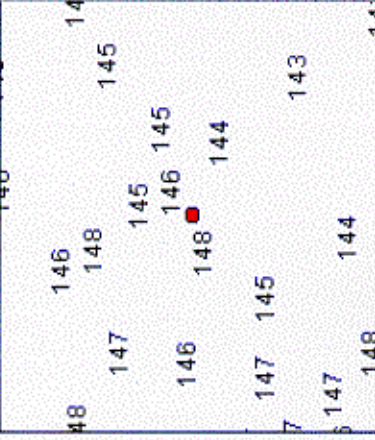
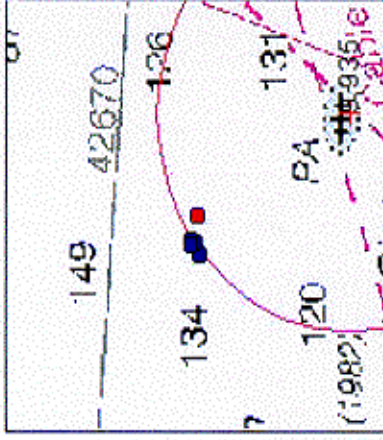
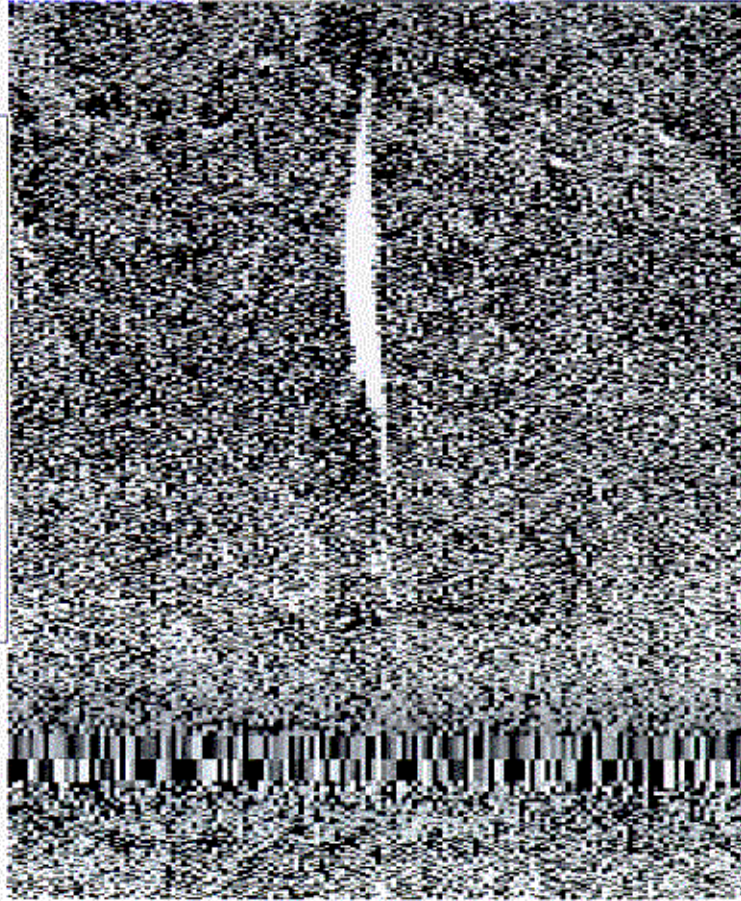
252.0

252.0

252.0

252.0

Local Contacts



Resolution

SSS Height 5.6  
Apparent Height 0.28  
Average Depth 44.9  
Top Depth  
Length 0  
Width 0

Significance Criteria  
5.6 > 1 m < 20 m or 10 %  
39.3 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact ht.  
0.28 > 100 % 5.6

Multibeam Coverage

Number of Depths is greater than X  
13 > 7

Top Depth is greater than local depth  
39.3 > 44.4

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

Insignificant debris near surveyed wreck.  
Not investigated in 2000.

217\_061\_1443\_1

Offset 53

Shad Len 0

Correlating Contact

215\_060\_2120\_1

Correlating Dist

8

SSS Height 7.6

Second Hit

Con Lat 38-50-37.92 N

Con Lon 075-04-30.5 W

Development

Least Depth 38.5 m AWOIS# 9935

Least Depth 126 ft AWOIS Dist 994.1

Day of LD 252 LD Lat 38-50-38.13 N

Contact Dist 6.5 LD Lon 075-04-30.46 W

LD Source Fz2000\_1\_A\_WH05\_2000-252\_036\_1454\_1

Comments

Contact Remark 0, +DEV HYDRO DIVE S/A 215060

Investigation SWMB

Charting Rcc chart "wreck, not a danger to surface navigation" at surveyed position.

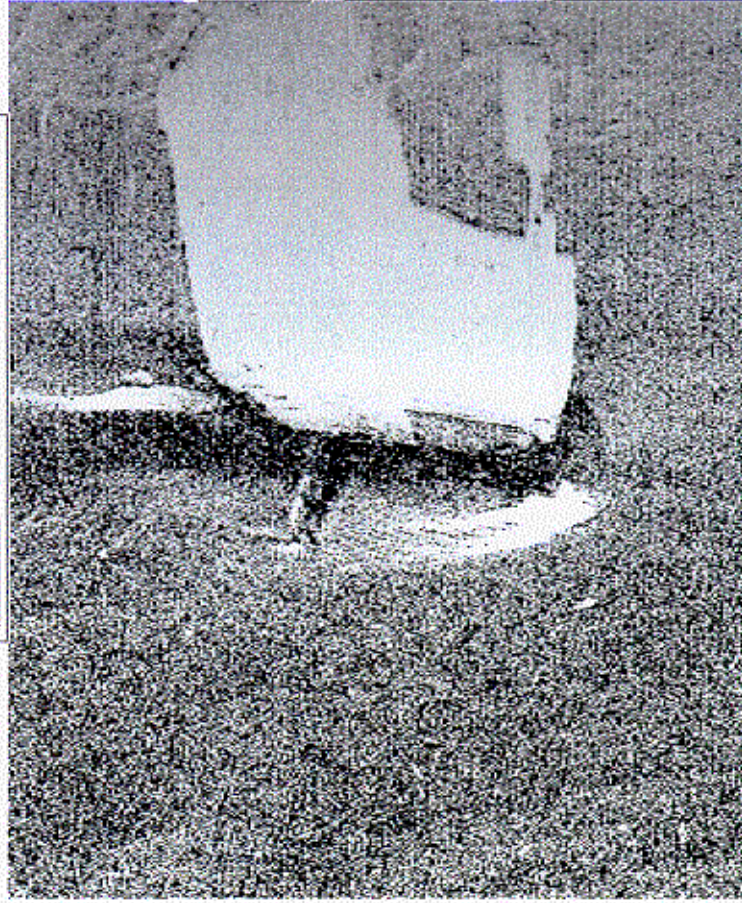
Chart Item

WRK

Matching Swath Info

Line Day Fix Range

VM



0 meters width 0 meters height

DTON

DTON

DTON

Fixes <Radius

2

252.0

252.0

252.0

252.0

Local Contacts

215\_060\_2120\_1 7.95

238\_039\_2044\_1 22.5

51396.0 22.05999

Resolution

SSS Height 7.6

Apparent Height 6.94

Average Depth 45

Top Depth 0

Length 0

Width 0

Significance Criteria

7.6 > 1 m < 20 m or 10 %

37.4 < 25

Auto-Signify

Significant

Both Criteria must be red for Auto-Signify

Resolution Criteria

Relief is greater than X% of contact ht

6.94 > 100 % 7.6

Auto-Resolve

Resolved

Multibeam Coverage

Number of Depths is greater than X

103 > 7

Top Depth is greater than local depth

37.4 > 31

Any green means resolved

Resolution Notes

Found in H-10917 with side scan and vbes developments. Least depth of 102.4 ft

238\_039\_2044\_1

Offset 11  
Shad Len 0  
Correlating Contact

215\_060\_2120\_1  
Correlating Dist 20.7

SSS Height 9.6

Second Hit  
Con Lat 38-50-38.58 N  
Con Lon 075-04-30.07 W

Development

Least Depth 39.95 m AWOIS# 0  
Least Depth 131 ft AWOIS Dist 0  
Day of LD 252 LD Lat 38-50-38.35 N  
Contact Dist 14.2 LD Lon 075-04-30.58 W  
LD Source Fe2000\_1\_A\_WHO5\_2000-252\_034\_1456\_1

Comments

0, +DEV w/flyd DIVE big one STAI

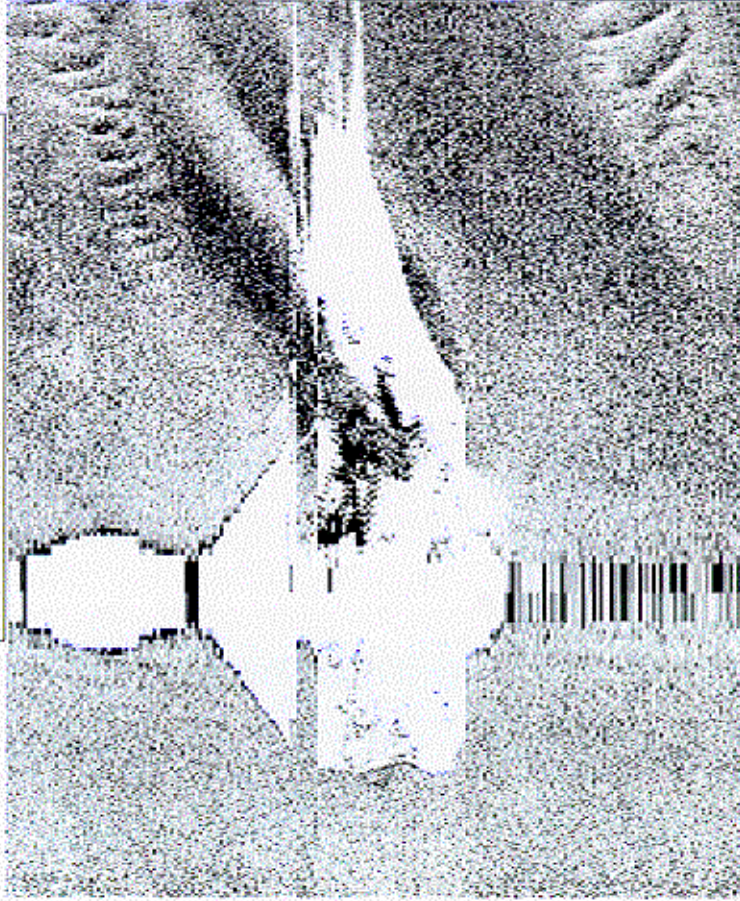
SWMB

Charting Rec

Chart Item  
chart "wreck, not a danger to surface navigation" at surveyed position.

Matching Swath Info

Line Day Fix Range



Resolution

SSS Height 9.6  
Apparent Height 6.12  
Average Depth 45  
Top Depth 0  
Length 0  
Width 0

Significance Criteria

9.6 > 1 m < 20 m or 10 %  
35.4 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

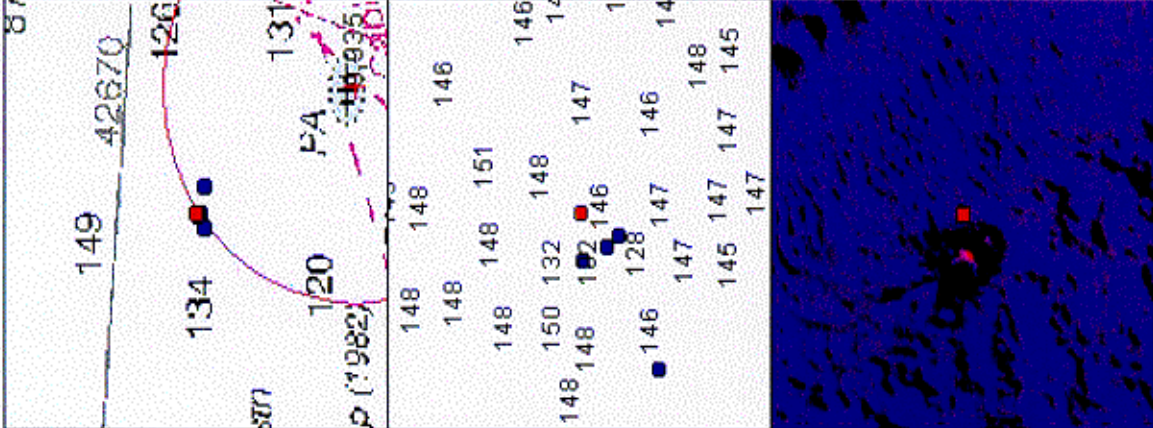
Resolution Criteria

Relief is greater than X% of contact ht  
6.12 > 100 % 9.6  
Multibeam Coverage   
Number of Depths is greater than X  
70 > 7  
Top Depth is greater than local depth  
35.4 > 31  
Any green means resolved

Auto-Resolve Resolved

Resolution Notes

Found in H-10917 with side scan and vbes developments. Least depth of 102.4 ft



AWOIS No: 9992

**Item Description:** Submerged rock located with 200% SSS and VBES developments during WHITING survey F00453 (1999).

**Source:** CL653/37, War Department, U.S. Engineers Office, H9202/71, F00453

**AWOIS Position:** 39° 02' 40.50" N, 075° 10' 09.00" W

**Required Investigation:** S2, ES, BD, DI, SD

**Radius:** 500 m

**Charts Affected:** 12304

---

**INVESTIGATION**

**Date(s):** September 7, 2000 (DN 251)

**Position Numbers:** HPS Fix # 31783.

**SWMB Data Source:** Fe2000\_24/WH05/2000-251/036\_1829/401/59

**Investigation Used:** SWMB

**Surveyed Positions:** 39° 02' 40.93" N, 075° 10' 06.60" W

**Position Determined By:** DGPS

**Investigation Summary:** 100% SWMB was obtained over contacts 236\_011\_2118\_1, 230\_011\_1516\_1, 236\_011\_2105\_1, 236\_004\_1748\_1 identified during WHITING F00453 (1999). A least depth of 35 ft was found for contact 230\_011\_1516\_1.

---

**CHARTING RECOMMENDATION**

**Recommendation:** The Hydrographer recommends deleting the charted Rk notation, and least depth of 30 ft, at the AWOIS position. Chart a rock with Rk notation, least depth of 35 ft, at latitude 39° 02' 40.93" N, longitude 075° 10' 06.60" W. *Do NOT CONEUT - INSIGNIFICANT CHART SURVEY SOUNDINGS*

*Delete (30) Rk  
Add "rky"*



236\_011\_2118\_1

Offset -24  
Shad Len 0  
Correlating Contact

Correlating Dist 0

SSS Height 0

Second Hit

Con Lat 39-02-41.01 N

Con Lon 075-10-08.52 W

Development

Least Depth 10.9 m AWOIS# 9992  
Least Depth 35 ft AWOIS Dist 19.6  
Day of LD 251 LD Lat 39-02-40.69 N  
Contact Dist 12 LD Lon 075-10-08.79 W  
I.D. Source Fe2000\_24\_WH05\_2000-251\_032\_1821\_44

Comments

Contact Remark 0, +DEV hyd Awois 9992- Rock Ptl

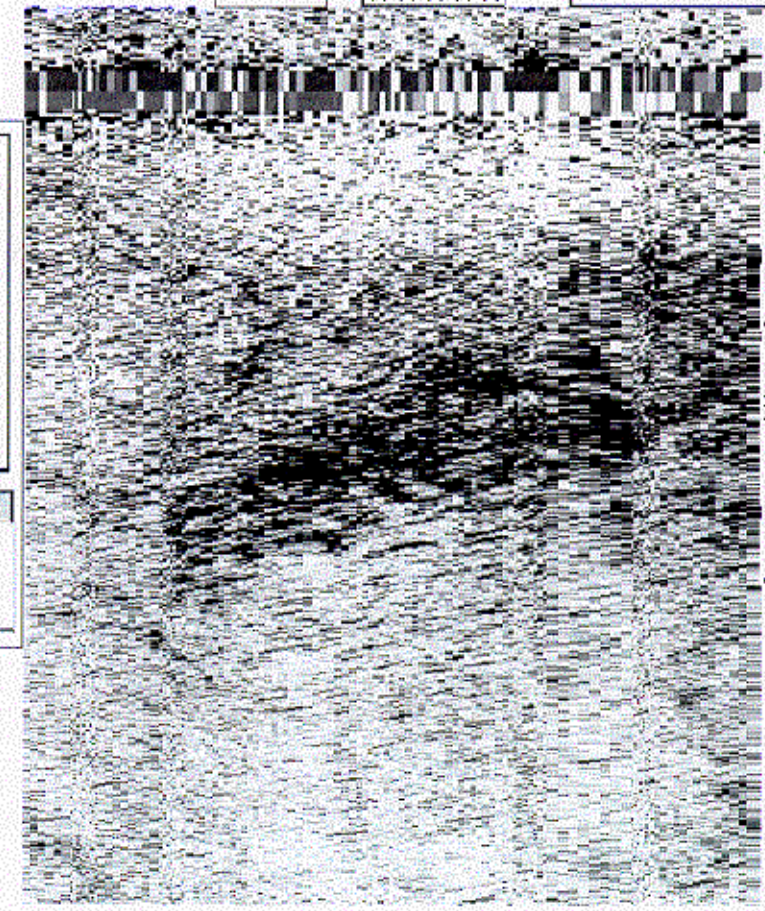
Investigation SWMB

Charting Rec chart representative soundings

Chart Item

Matching Swath Info

Line Day Fix Range



Resolution

SSS Height 0  
Apparent Height 0.29  
Average Depth 11.1  
Top Depth 0  
Length 0  
Width 0

Significance Criteria

0 > 1 m < 20 m or 10 %  
11.1 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact ht.

0.29 > 100 % 0

Multibeam Coverage

Number of Depths is greater than X

32 > 7

Top Depth is greater than local depth

11.1 > 10:1

Any green means resolved

Auto-Resolve Resolved

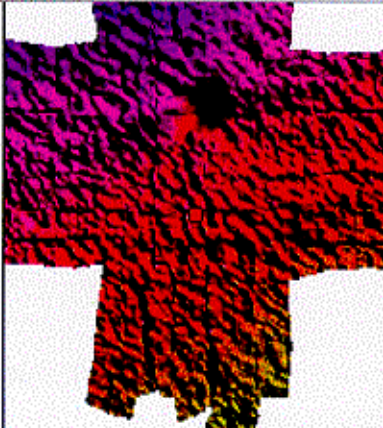
Resolution Notes

Investigated in F-00453.

onal  
or  
ean

9992

36 37 38 38 38  
36 37 37  
34 34 35 36 36 36 37 38 38  
34 34 35 35 36 37 38 38 3  
33 34 35 35 36 36 37 38  
33 33 34 35 35 36 36 37 37 3  
34 36 36 36 37  
34 35 35 36 36 37



236\_011\_2105\_1

Offset -23  
Shad Len 0  
Correlating Contact

230\_011\_1516\_1  
Correlating Dist 22.5

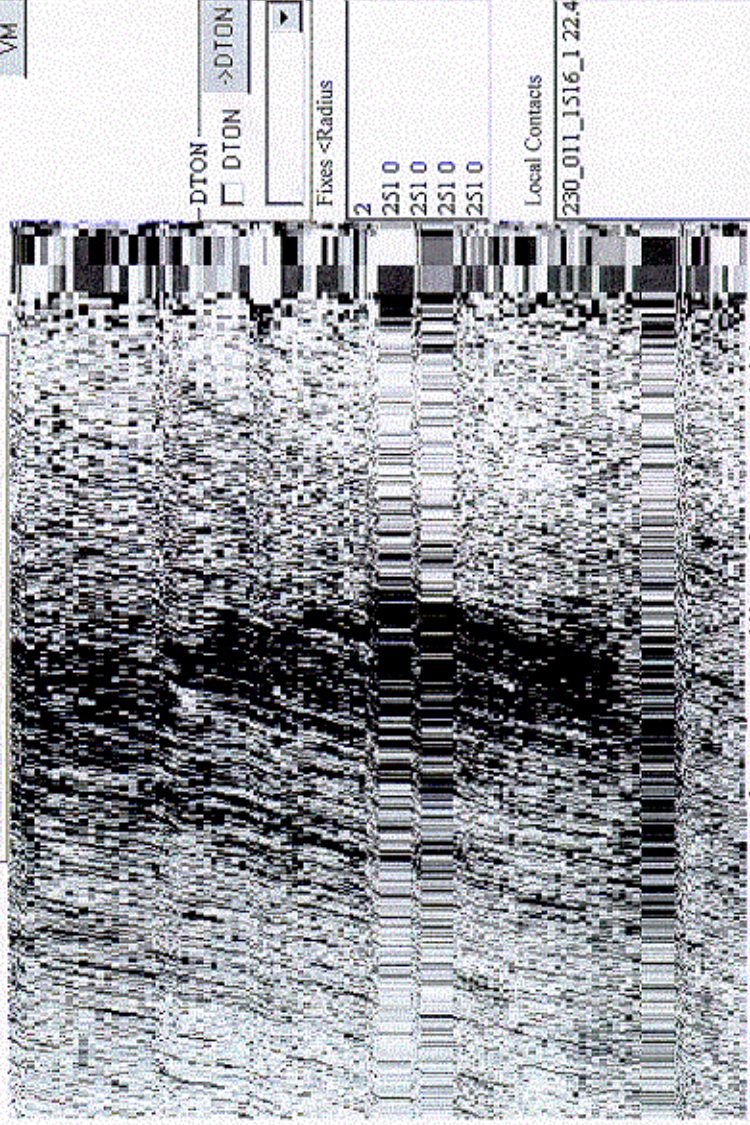
SSS Height 0  
 Second HR  
Con Lat 39-02-40.7 N  
Con Lon 075-10-06.19 W

Development  
Least Depth 10.67 m AWOIS# 0  
Least Depth 35 ft AWOIS Dist 0  
Day of LD 251 LD Lat 39-02-40.93 N  
Contact Dist 12.3 LD Lon 075-10-06.6 W  
I.D Source Fe2000\_24\_WHO5\_2000-251\_036\_1829\_40

Comments  
Contact Remark 0, +DEV HYD A W9992 Rock Pile?  
Investigation SW7MB

Charting Rec  
 Chart Item  
OBSTN  
chart "obstruction, least depth known by sounding only, 35" at surveyed position.

Matching Swath Info  
Line Day Fix Range



0 meters width 0 meters height

Final for plan

9992

36 37 37 37 38  
36 37 37  
36 36 37 37 38 38 39 40 40  
35 35 36 36 37 38 38 39 39 4  
35 35 36 36 37 38 38 39 39 39  
4 35 36 36 37 38 38 39 39  
35 35 36 36 36 37 37 38 38 39  
34 36 36 37  
34 35 36 36 36  
35 35 36 36



Resolution

SSS Height 0  
Apparent Height 0.99  
Average Depth 11.4  
Top Depth 0  
Length 0  
Width 0

Significance Criteria  
0 > 1 m < 20 m or 10 %  
11.4 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact ht.

0.99 > 100 % 0

Multibeam Coverage

Number of Depths is greater than X

37 > 7

Top Depth is greater than local depth

11.4 > 10.5

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

Investigated in F-00453.

236\_004\_1748\_1

Offset 25

Shad Len 0

Correlating Contact

230\_011\_1516\_1

Correlating Dist

18.1

SSS Height 4

Second Hit

Con Lat 39-02-41.68 N

Con Lon -075-10-06.84 W

Development

Least Depth 11.1 m AWOIS# 0  
Least Depth 36 ft AWOIS Dist 0  
Day of LD 251 LD Lat 39-02-41.2 N  
Contact Dist 14.7 LD Lon 075-10-06.77 W  
LD Source F22000\_24\_WH05\_2000-251\_035\_1827\_41

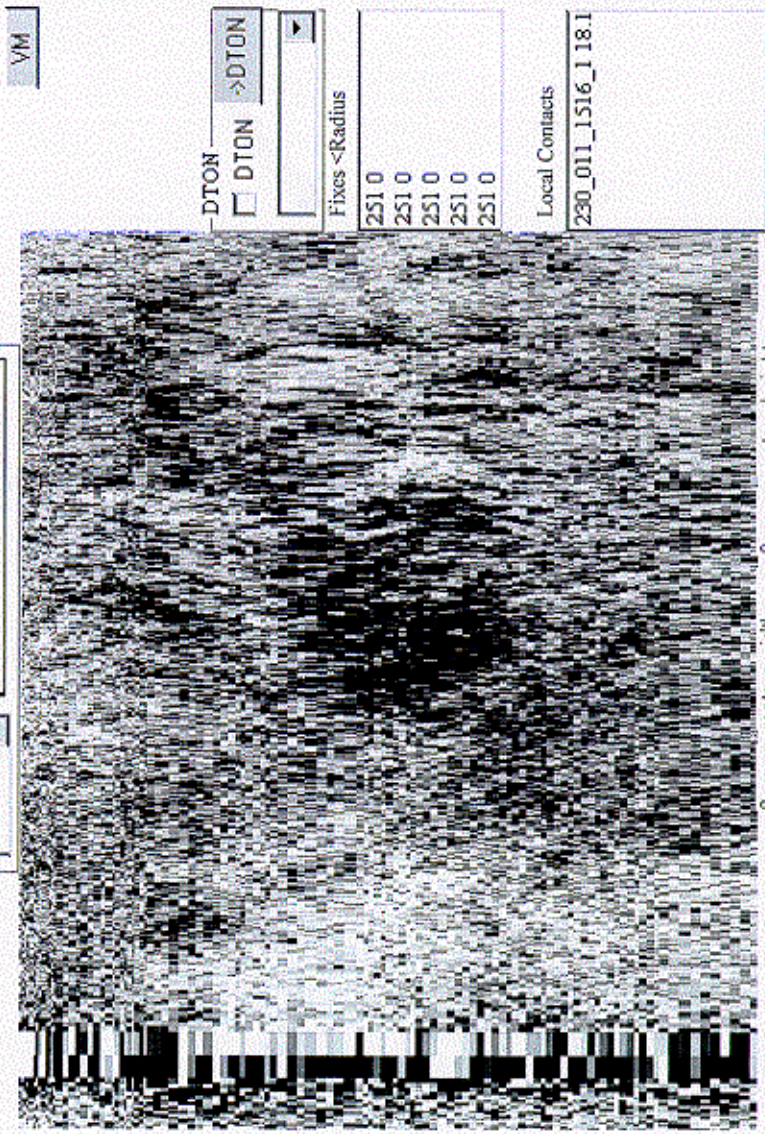
Comments

Contact Remark 0, +DEV hyd Aw9992 rock pile- sh  
Investigation SWMB

Charting Rec

Chart Item  
OBSTN chart "obstruction, least depth known by sounding only, 35" at surveyed position.

Matching Swath Info  
Line Day Fix Range



36	37	38	38	38				
36	37	37	37	38				
36	36	37						
35	35	36	36	37	38	39	39	40
35								
34	35	36	36	37	38	38	39	39
34	35	36	36	36	37	38	38	38
34	35	35	36	36	37	38	38	38
34	35	35	36	36	37	38	38	38
34	35	35	36	36	37	38	38	38



Resolution  
SSS Height 4  
Apparent Height 0.55  
Average Depth 11.3  
Top Depth  
Length 0  
Width 0

Significance Criteria  
4 > 1 m < 20 m or 10 %  
7.3 < 25  
Both Criteria must be red for Auto-Signify

Auto-Signify Significant

Resolution Criteria  
Relief is greater than X% of contact ht.  
0.55 > 100 % 4

Multibeam Coverage

Number of Depths is greater than X  
33 > 7

Top Depth is greater than local depth  
7.3 > 10.5

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

Investigated in F-00453.

onal  
for  
can

9992

VM

DTON

DTON

Fixes <Radius

251 0

251 0

251 0

251 0

251 0

Local Contacts

230\_011\_1516\_1 18.1

230\_011\_1516\_1

Offset 6

Shad Len 0

Correlating Contact

236\_004\_1748\_1

Correlating Dist

18.1

SSS Height 0

Second Hit

Con Lat 39-02-41.1 N

Con Lon 075-10-06.97 W

Development

Least Depth 10.67 m AWOIS# 0

Least Depth 35 ft AWOIS Dist 0

Day of LD 251 LD Lat 39-02-40.93 N

Contact Dist 10.2 LD Lon 075-10-06.6 W

LD Source Fe2000\_24\_W#05\_2000-251\_056\_1829\_40

Comments

Contact Remark 0, +DEV Awois 9992 XRef fathoms

Investigation SWMB

Charting Rec

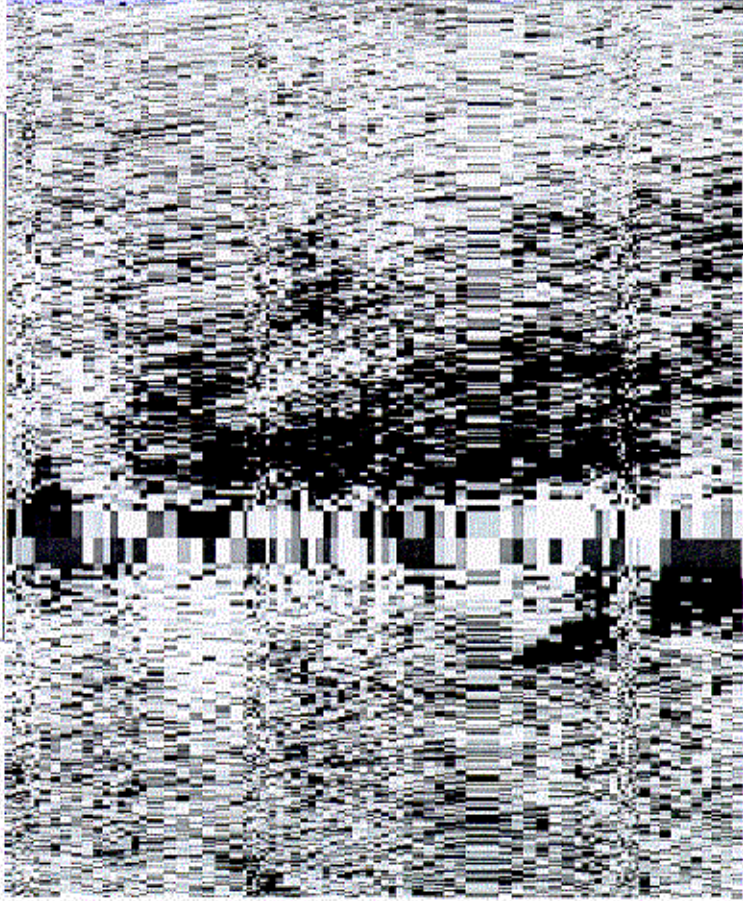
Chart Item chart "obstruction, least depth known by sounding only, 35" at surveyed position.

OBSIN

Matching Swath Info

Line Day Fix Range

VM



0 meters width 0 meters height

DTON ->DTON

DTON

2. Rock

Fixes <Radius

2

251 0

251 0

251 0

251 0

Local Contacts

236\_004\_1748\_1 18.1

236\_011\_2105\_1 22.4

Resolution

SSS Height 0

Apparent Height 0.77

Average Depth 11.3

Top Depth

Length 0

Width 0

Significance Criteria

0 > 1 m < 20 m or 10 %

11.3 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify

Significant

Resolution Criteria

Relief is greater than X% of contact hit.

0.77 > 100 % 0

Multibeam Coverage

Number of Depths is greater than X

37 > 7

Top Depth is greater than local depth

11.3 > 10.4

Any green means resolved

Auto-Resolve

Resolved

Resolution Notes

Investigated in F-00453.

AWOIS No: 10,401

**Item Description:** Wreck BEAR RIDGE located with 200% SSS during WHITING survey H10935 (1999). Scaled least depth of 45.3 ft determined in latitude 38° 55' 39.62" N, longitude 74° 45' 33.40" W.

**Source:** CL347/58, Navy Wreck List

**AWOIS Position:** 38° 55' 30" N, 074° 45' 28" W

**Required Investigation:** S2, DI, SD

**Radius:** 1500 m

**Charts Affected:** 12214

---

**INVESTIGATION**

*Sheet 4*

**Date(s):** July 17, 2000 (DN 199)

*CHART 12214*

**Position Numbers:** HPS Fix # 31583.

**SWMB Data Source:** Fe2000\_19\_Esup/WH05/2000-205/008\_1639/379/36

**Investigation Used:** SWMB

**Surveyed Position:** 38° 55' 44.843" N, 074° 44' 53.753" W

**Position Determined By:** DGPS

**Investigation Summary:** During H10935 (1999), two clusters of contacts were located by WHITING with SSS in the assigned search radius. Contacts in the <sup>western</sup> eastern cluster were 275\_110\_0250\_1, 274\_211\_2202\_2, and 274\_212\_2216\_1 (H109935, 1999 data). SSS imagery clearly shows the remains of a wooden vessel (presumed to be the BEAR RIDGE) and other debris. None had significant height. Contacts in the <sup>EAST</sup> west cluster were 272\_124\_0514\_1 and 272\_223\_1940\_1 (H10935, 1999 data). SSS imagery shows debris with one item of significant height estimated at 17.7 ft (5.4 m).

Full-coverage SWMB data was acquired over each of these two clusters during this field examination. No significant relief over the wreck of the BEAR RIDGE was detected. SWMB data over the ~~west~~ <sup>EAST</sup>

cluster located a least depth of 9.288 m (30.47 ft). This item was submitted as a Danger to Navigation (#4), dated March 14, 2001.

**CHARTING RECOMMENDATION**

**Recommendation:** The Hydrographer recommends deleting the charted wreck symbol<sup>\*</sup> at the AWOIS position. Chart a wreck, not dangerous to surface navigation, at latitude 38° 55' 39.86" N, longitude 074° 44' 33.6" W. <sup>consult</sup> Chart surveyed depths where shoaler to supersede chart. Second, the Hydrographer recommends charting an obstruction, least depth ~~30~~ ft, in latitude 38° 55' 44.843" N, longitude 074° 44' 53.753" W. <sup>consult</sup> <sub>31</sub>

Add 47 WK

Add 31 Obstr

\* WRECK NOT CHARTED ON 12214, 43rd Ed, Dec 16/00

274\_211\_2202\_2

Offset 3  
Shad Len 0  
Correlating Contact  
275\_110\_0250\_1

Correlating Dist 9

SSS Height 0  
 Second Hit  
Con Lat 38-55-39.86 N  
Con Lon 074-45-33.6 W

**Development**  
Least Depth 14.6 m AWOIS# 10401  
Least Depth 48 ft AWOIS Dist 337.3  
Day of LD 205 LD Lat 38-55-39.94 N  
Contact Dist 2.3 LD Lon 074-45-33.62 W  
LD Source Fe2000\_19\_Eaup\_WH05\_2000-205\_005\_16

**Comments**  
Contact Remark 0, For '00 unresvd DEV HYD Possib  
Investigation SWMB

**Charting Rec**  
 Chart Item  
WRK  
Chart "Wreck, least depth known  
by sounding only, 48" at surveyed  
position.

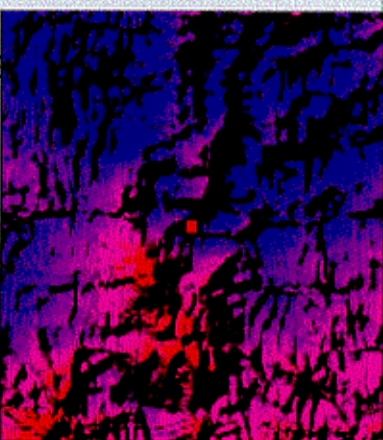
**Matching Swath Info**  
Line Day Fix Range



DTON >DTON  
 DTON  
6, Wreck  
Fixes <Radius  
205 0  
205 0  
205 0  
205 0  
205 0  
Local Contacts  
275\_110\_0250\_1 8.96

VM

47	47	48	49	48	48	49	49
47	47	48	48	48	48	49	49
47	47	48	48	49	49	49	49
48	47	47	46	47	48	49	49
47	46	47	47	48	48	48	48
47	48	48	48	47	48	48	48
47	47	48	48	48	49	48	49
47	48	48	48	48	48	49	49



**Resolution**  
SSS Height 0  
Apparent Height 0.3  
Average Depth 14.8  
Top Depth  
Length 0  
Width 0

**Significance Criteria**  
0 > 1 m < 20 m or 10 %  
14.8 < 25  
Both Criteria must be red for Auto-Signify

Auto-Signify Significant

**Resolution Criteria**  
Relief is greater than X% of contact ht  
0.3 > 100 % 0  
Multibeam Coverage   
Number of Depths is greater than X  
22 > 7  
Top Depth is greater than local depth  
14.8 > 14.2  
Any green means resolved

Auto-Resolve Resolved

**Resolution Notes**

WRK REMOVED FROM INTER CHART

274\_212\_2216\_1

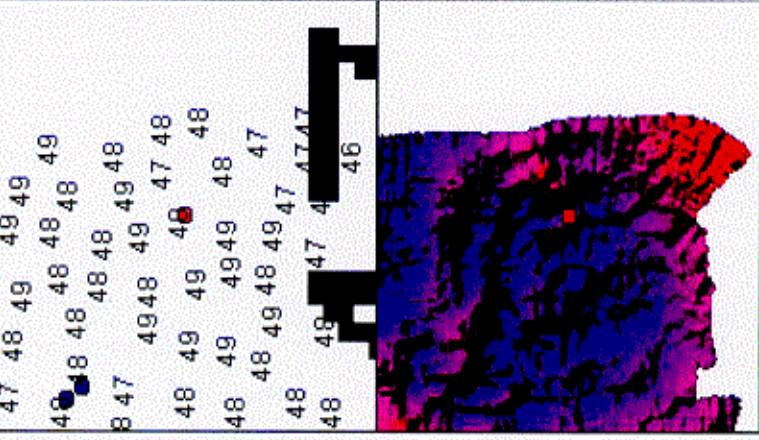
Offset 33  
Shad Len 0  
Correlating Contact

Correlating Dist 0  
SSS Height 0.3  
 Second Hit  
Con Lat 38-55-37.87 N  
Con Lon 074-45-30.08 W

**Development**  
Least Depth 14.6 m AWOIS# 10401  
Least Depth 48 ft AWOIS Dist 245.5  
Day of LD 205 LD Lat 38-55-37.99 N  
Contact Dist 14.9 LD Lon 074-45-29.48 W  
LD Source Fe2000\_19\_Esup\_w1105\_2000-205\_004\_15

**Comments**  
Contact Remark **Q For '00 unresvd DEV HYD Inside**  
Investigation **SWMB**  
Charting Rec **Chart representative soundings.**  
 Chart Item

**Matching Swath Info**  
Line Day Fix Range



**Resolution**

SSS Height 0.3  
Apparent Height 0.5  
Average Depth 14.8  
Top Depth Length 0  
Width 0

**Significance Criteria**

0.3 > 1 m < 20 m or 10 %  
14.5 < 25

Both Criteria must be red for Auto-Signity

Auto-Signity Significant

**Resolution Criteria**

Relief is greater than X% of contact ht.

0.5 > 100 % 0.3

Multibeam Coverage

Number of Depths is greater than X

18 > 7

Top Depth is greater than local depth

14.5 > 14.2

Any green means resolved

Auto-Resolve Resolved

**Resolution Notes**

Debris near surveyed wreck.

-DTON

DTON

Fixes <Radius

205 0

205 0

205 0

205 0

205 0

Local Contacts

VM

-DTON

DTON

Fixes <Radius

205 0

205 0

205 0

205 0

205 0

Local Contacts



275\_110\_0250\_1

Offset -23

Shad Len 0

Correlating Contact

274\_211\_2202\_2

Correlating Dist

9

SSS Height 0.8

Second Hit

Com Lat 38-55-39.62 N

Com Lon 074-45-33.4 W

Development

Least Depth 14.6 m AWOIS# 10401  
Least Depth 48 ft AWOIS Dist 328.4  
Day of LD 205 LD Lat 38-55-39.64 N  
Contact Dist 7.7 LD Lon 074-45-33.08 W  
LD Source Fe2000\_19\_Esup\_W1105\_2000-205\_001\_16

Comments

Contact Remark 0 For '00 unresolv HYD DEV possi  
Investigation SWMB  
Charting Rec Chart "Wreck, least depth known  
by sounding only, 48' " at surveyed  
position.  
 Chart Item WPK

Matching Swath Info

Line Day Fix Range

VM

DTON

DTON

Wreck

Fixes <Radius

205 0

205 0

205 0

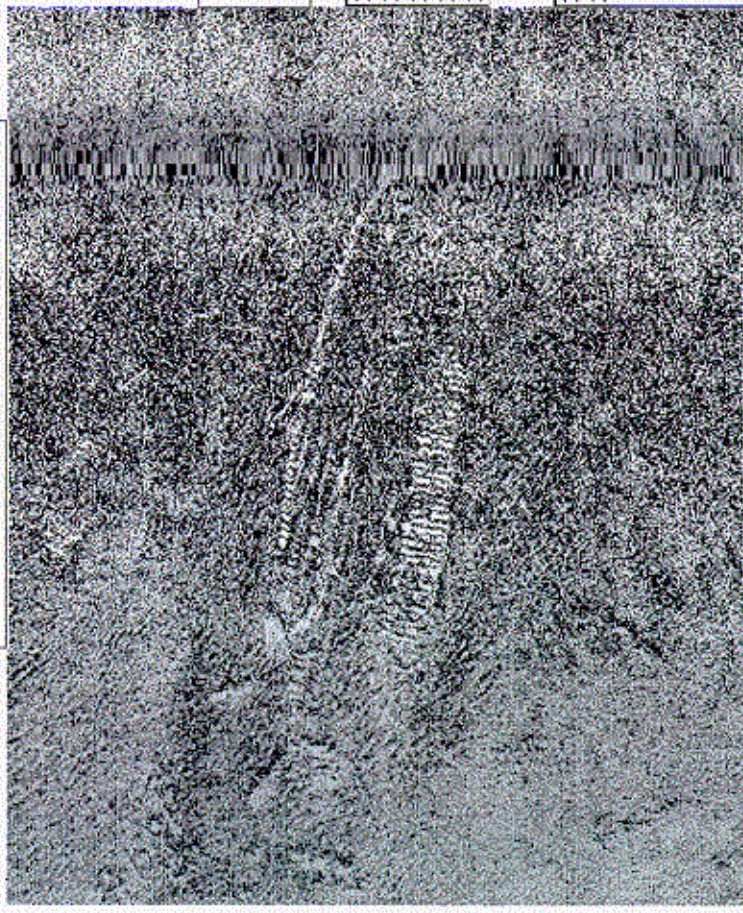
205 0

205 0

Local Contacts

274\_211\_2202\_2896

274\_211\_2202\_2896



Resolution

SSS Height 0.8  
Apparent Height 0.3  
Average Depth 14.8  
Top Depth  
Length 0  
Width 0

Significance Criteria

0.8 > 1 m < 20 m or 10 %  
14 < 25  
Both Criteria must be red for Auto-Signify

Auto-Signify Significant

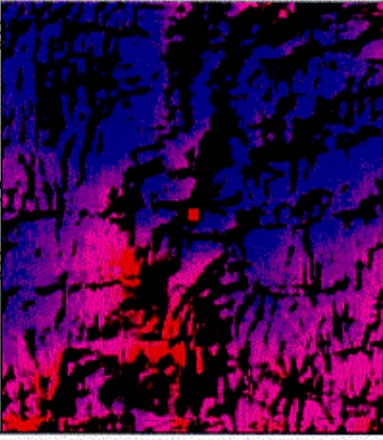
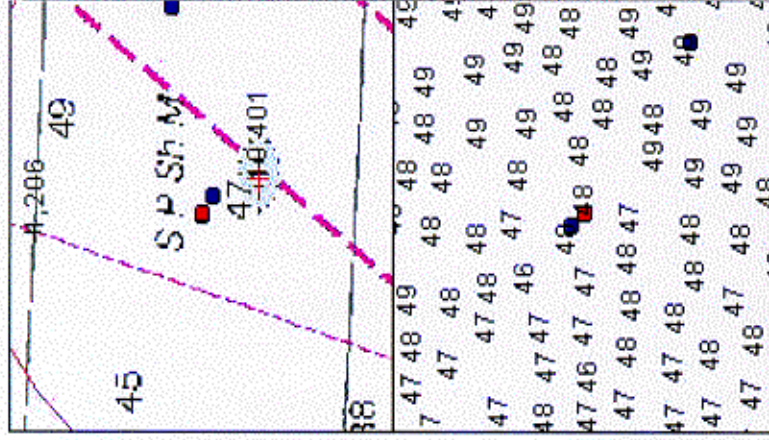
Resolution Criteria

Relief is greater than X% of contact ht  
0.3 > 100 % 0.8  
Multibeam Coverage   
Number of Depths is greater than X  
23 > 7  
Top Depth is greater than local depth  
14 > 14.2  
Any green means resolved

Auto-Resolve Resolved

Resolution Notes

Delete charted Wreck at areois position.



272\_124\_0514\_1

Offset -60

Shad Len 0

Correlating Contact

272\_223\_1940\_1

Correlating Dist

3.3

SSS Height 4.1

Second Hit

Con Lat 38-55-45.08 N

Con Lon 074-44-53.63 W

Development

Least Depth 9.3 m AWOIS# 10401  
 Least Depth 30 ft AWOIS Dist 912.9  
 Day of LD 205 LD Lat 38-55-44.84 N  
 Contact Dist 7.8 LD Lon 074-44-53.75 W  
 LD Source Fe2000\_19\_Esup\_WHO5\_2000-205\_008\_16

Comments

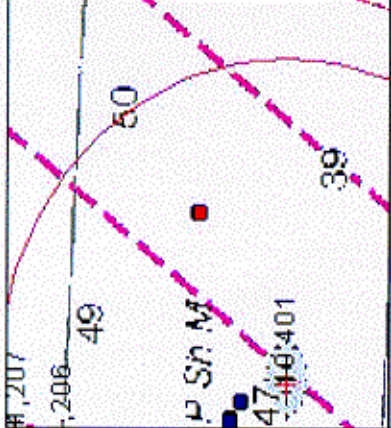
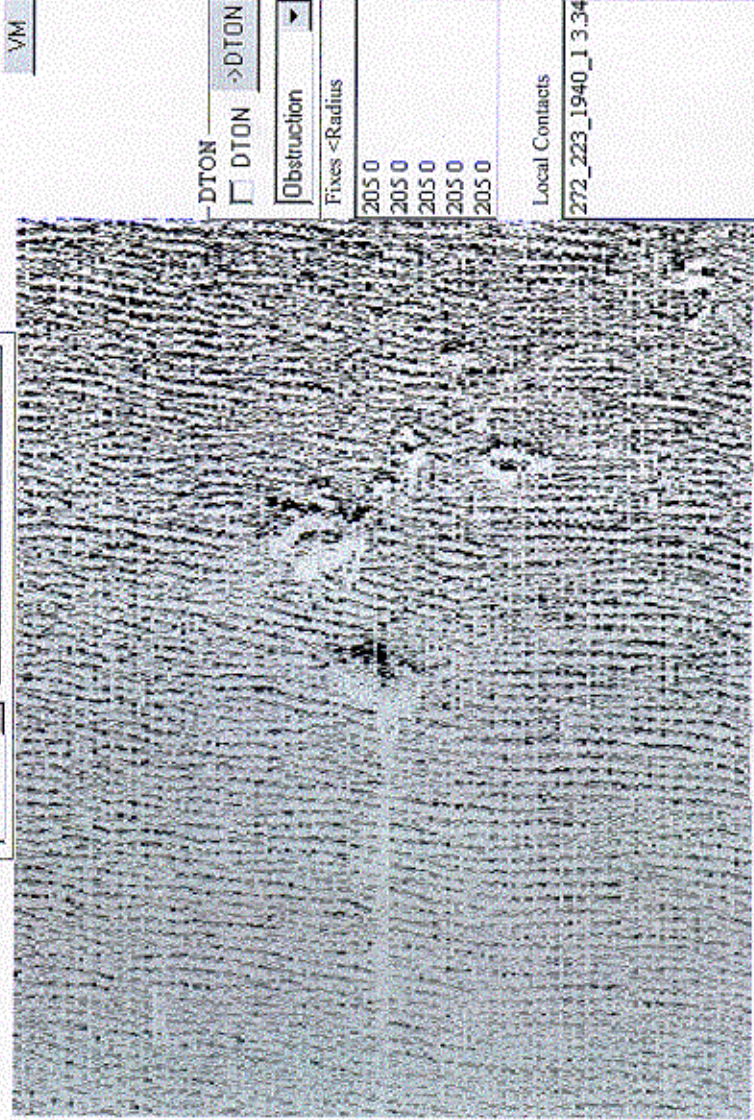
Contact Remark 0, +DEV HYD LONG shadow scath

Investigation SWZMB

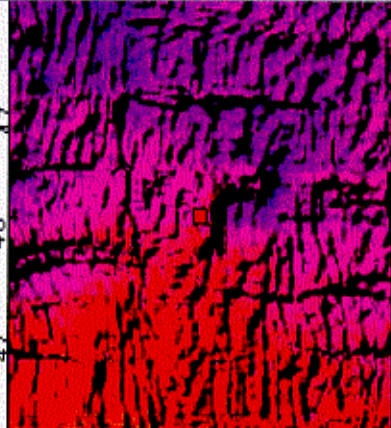
Charting Rec

Chart Item Chart "Obstruction, least depth known by sounding only, 30" at the surveyed position.

Matching Swath Info  
Line Day Fix Range



6	46	47	48	47	47	48	48	4
5	46	46	47	47	47	48	48	48
4	45	46	46	47	47	48	48	48
3	45	46	46	45	47	47	48	48
2	46	46	47	47	48	47	48	48
1	6	46	47	47	47	48	48	48
0	46	47	47	47	47	48	48	48
	7	47	47	48	48	48	48	4
	46	47	47	47	48	48	48	48
	47	47	47	48	48	48	48	4
	46	47	47	48	48	48	48	4



Resolution

SSS Height 4.1  
 Apparent Height 5.4  
 Average Depth 14.6  
 Top Depth  
 Length 0  
 Width 0

Significance Criteria  
 4.1 > 1 m < 20 m or 10 %  
 10.5 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact ht.  
 5.4 > 100 % 4.1 ●

Multibeam Coverage

Number of Depths is greater than X  
 32 > 7 ●

Top Depth is greater than local depth  
 10.5 > 13.9 ●

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

272\_223\_1940\_1

Offset 19  
Shad Len 0  
Correlating Contact

272\_124\_0514\_1

Correlating Dist 3.3

SSS Height 1.2

Second Hit

Con Lat 38-55-45.1 N

Con Lon 074-44-53.76 W

Development

Least Depth 9.3 m AWOIS# 10401  
Least Depth 30 ft AWOIS Dist 910.4  
Day of LD 205 LD Lat 38-55-44.84 N  
Contact Dist 7.8 LD Lon 074-44-53.75 W  
LD Source Fe2000 19\_Esup\_WH05\_2000-205\_008 16

Comments

Contact Remark 0, +DEV HYD scattered debris LON

Investigation SWMB

Charting Rec

Chart Item OBSTN  
Chart "Obstruction, least depth known by sounding only, 30" at the surveyed position."

Matching Swath Info  
Line Day Fix Range

VM  
-DTON ->DTON  
 DTON  
5. Obstruction  
Fixes <Radius  
205 0  
205 0  
205 0  
205 0

Local Contacts

272\_124\_0514\_1 3.34

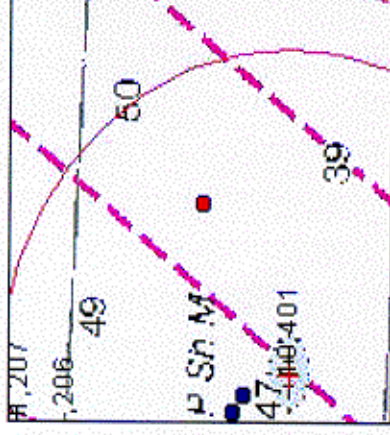
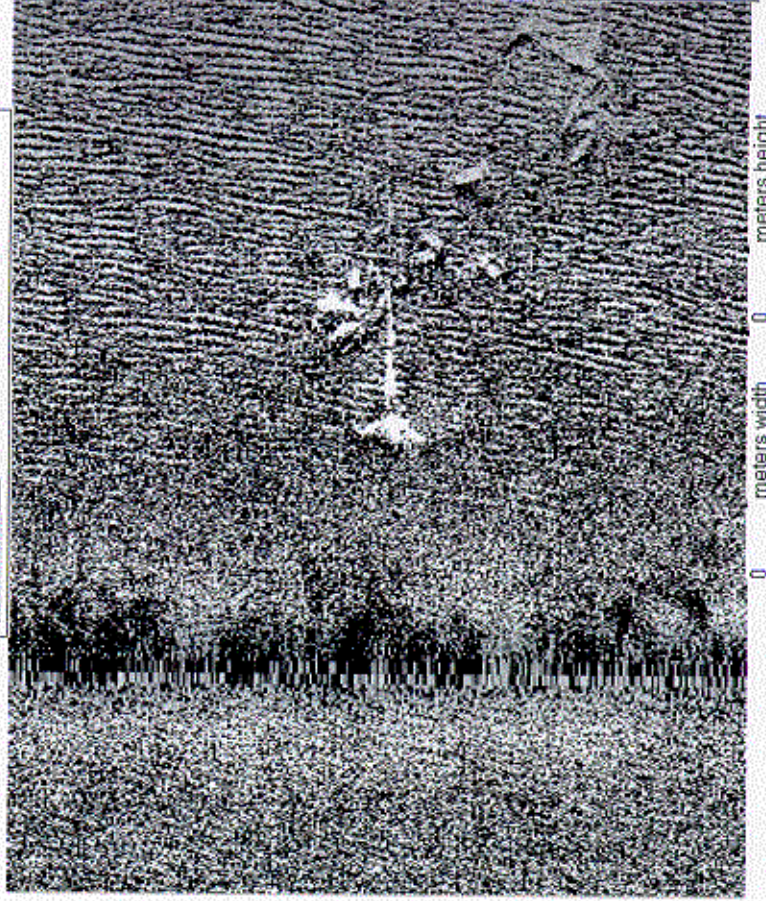
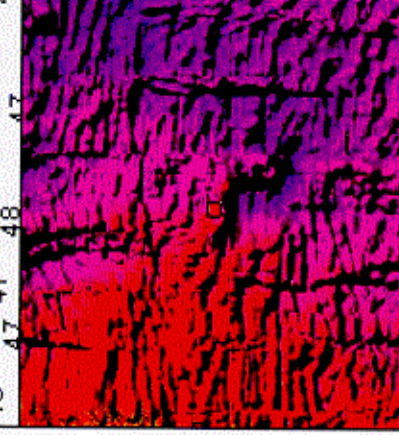


Table with depth data:

47	47	47	47	47	48	48
46	47	47	47	47	48	48
45	46	46	47	47	48	48
45	46	45	47	47	48	48
46	46	47	47	47	48	48
6	46	47	47	47	48	48
48	47	47	47	47	48	48
7	47	47	47	47	48	48
46	47	47	47	47	48	48



Resolution

SSS Height 1.2  
Apparent Height 5.4  
Average Depth 14.6  
Top Depth 0  
Length 0  
Width 0

Significance Criteria

1.2 > 1 m < 20 m or 10 %  
13.4 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact ht  
5.4 > 100 % 1.2  
Multibeam Coverage   
Number of Depths is greater than X  
30 > 7  
Top Depth is greater than local depth  
13.4 > 13.9  
Any green means resolved

Auto-Resolve Resolved

Resolution Notes

Submited in 1999 as 31' DTON  
Submited in 2000 as 30' DTON

**Item Investigation:** Cape May Inlet

**Item Description:** Reconnaissance for WHITING entry to U.S. Coast Guard Station Cape May. Local information from USCG indicated the 16-ft depth charted at the entrance to Cape May Inlet was shoaling. Surveyed at the discretion of WHITING Command as part of F00467 (2000).

**Source:** None

**AWOIS Position:** N/A

**Required Investigation:** None

**Radius:** N/A

**Charts Affected:** 12317,12316,12214,12304

SHEET 12  
CHARTS 12317  
12214  
12304

---

**INVESTIGATION**

**Date(s):** July 17, 2000 (DN 199). This item is under HPS project "Capemay", Sheet 24.

**Position Numbers:** HPS Fix # 3024~~4~~5

**SWMB Data Source:** Capemay/WH05/2000-199/008\_1556/2388\_15

**Investigation Used:** SWMB

**Surveyed Position:** 38° 56' 15.5" N, 074° 51' 52.06" W

**Position Determined By:** DGPS

**Investigation Summary:** The entrance to Cape May Inlet was surveyed with SWMB. The least depth over the 16 ft shoal at the entrance jetties was found to be <sup>12</sup>~~11~~ ft. See Figures 3 and 4. This item was submitted as a Danger to Navigation (No. 8), dated March 14, 2001.

---

**CHARTING RECOMMENDATION**

**Recommendation:** The Hydrographer recommends charting an <sup>12</sup>~~11~~ ft sounding at latitude 38° 56' 15.50" N, longitude 074° 51' 52.06" W. Update the chart with surveyed soundings in the applicable areas.

*Concur*

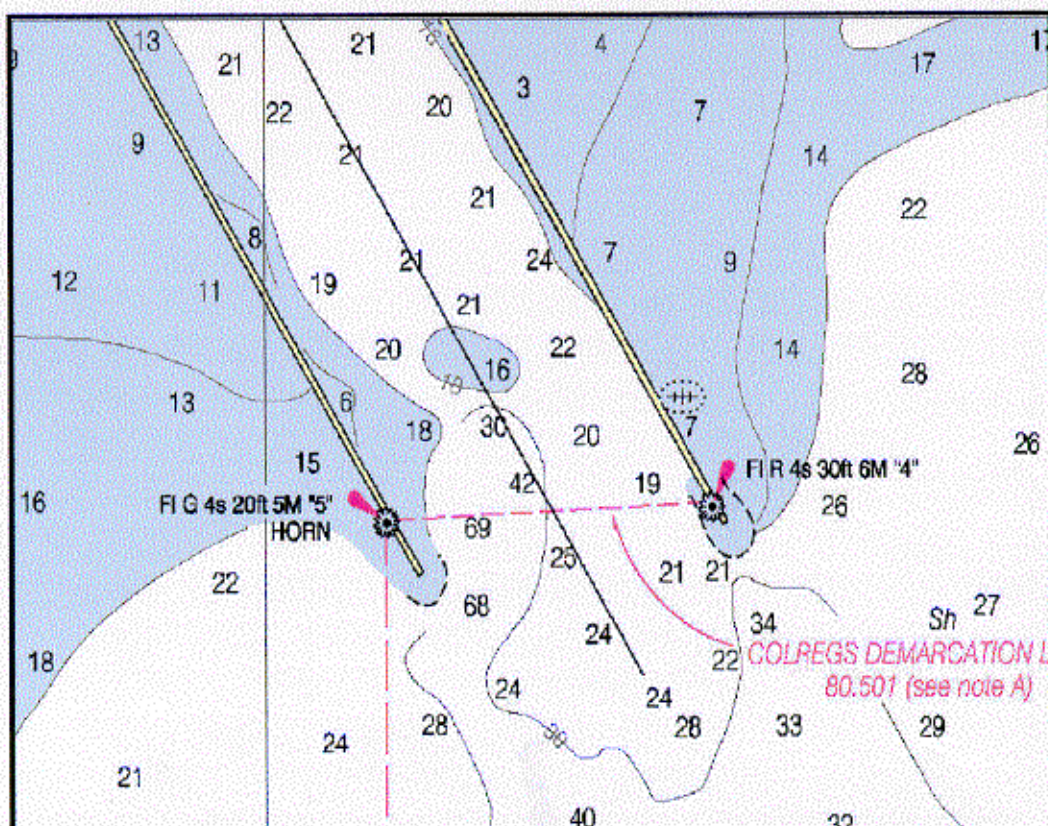


Figure 3: Entrance to Cape May Inlet (NOS Chart 12317, 30<sup>th</sup> Ed., Feb. 3, 1996)

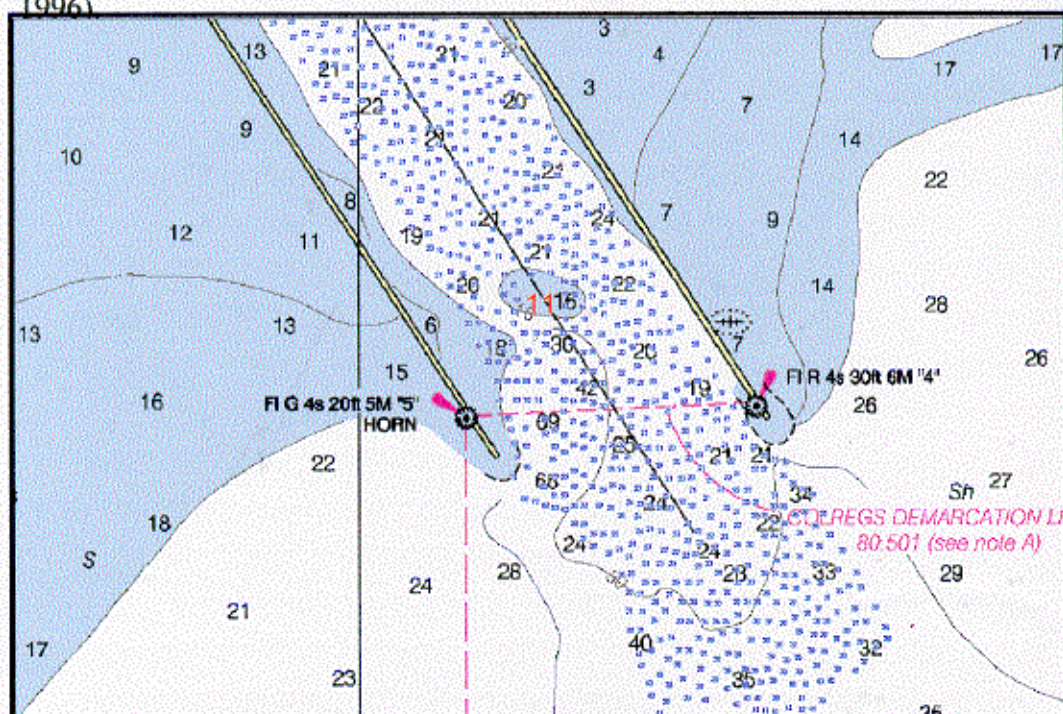


Figure 4: 11 ft DToN sounding on 16 ft charted depth.

**Item Investigation:** 30 ft Shoal**Item Description:** An area of shoaling was identified during WHITING survey H10954 (1999).**Source:** H10954**AWOIS Position:** None**Required Investigation:** None**Radius:** N/A**Charts Affected:** 12214

---

**INVESTIGATION****Date(s):** July 23 & 27, 2000 (DN 205, 209)*SHEET 5  
CHART 12214***Position Numbers:** HPS FIX # 41982.**SWMB Data Source:** Fe2000\_19\_Esup/WH05/2000-209/022\_1542/6077/99**Investigation Used:** SWMB**Surveyed Position:** 38° 57' 46.76" N, 074° 42' 56.9" W.**Position Determined By:** DGPS**Investigation Summary:** Complete SWMB coverage was acquired over an area of possible shoaling identified during WHITING survey H10954 (1999). A 30 ft least depth was found in the charted traffic zone at the surveyed position. This item was submitted as a Danger to Navigation (No. 7), dated March 14, 2001.

---

**CHARTING RECOMMENDATION****Recommendation:** The Hydrographer recommends charting a 30 ft sounding at latitude 38° 57' 46.76" N, longitude 074° 42' 56.90" W. *concur**Chart survey soundings*

Reference\_point5

Offset 0  
Shad Len 0  
Correlating Contact

Correlating Dist 0  
SSS Height 15  
 Second Hit  
Con Lat 38-57-46.76 N  
Con Lon 074-42-56.9 W

Development

Least Depth 9.2 m AWOIS# 0  
Least Depth 30 ft AWOIS Dist 0  
Day of LD 209 LD Lat 38-57-46.76 N  
Contact Dist 0 LD Lon 074-42-56.9 W  
LD Source Fe2000\_19\_Esup\_WI05\_2000-209\_022\_15

Comments

Contact Remark  
Investigation Shoal in channel area  
SWMB  
Charting Rec The Hydrographer recommends charting representative soundings  
 Chart Item

Matching Swath Info  
Line Day Fix Range

VM

DTON >DTON

DTON

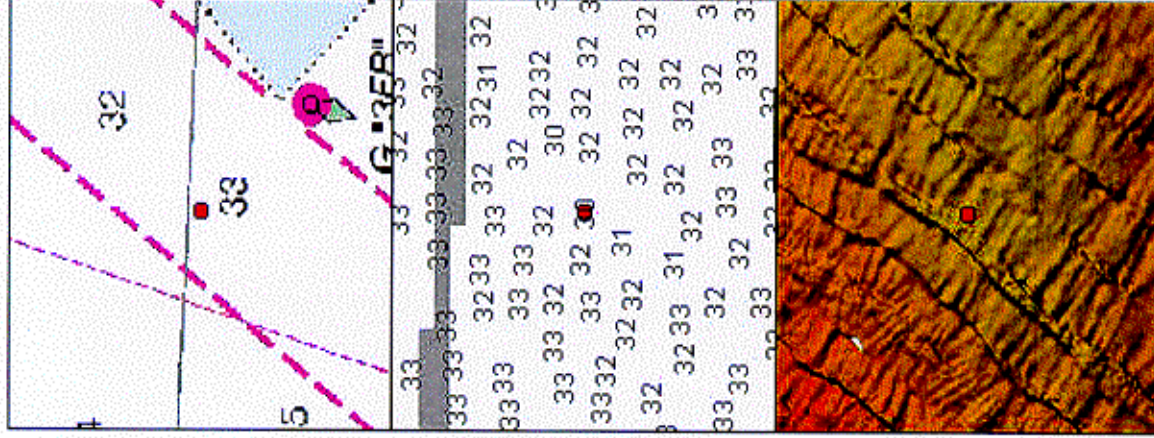
10, Sounding

Fixes <Radius

209 0  
209 0  
209 0  
209 0  
209 0

Local Contacts

0 meters width 0 meters height



Resolution

SSS Height 15  
Apparent Height 0.8  
Average Depth 10  
Top Depth 0  
Length 0  
Width 0

Significance Criteria

15 > 1 m < 20 m or 10 %  
-5 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact ht.

0.8 > 100 % 15

Multibeam Coverage

Number of Depths is greater than X

12 > 7

Top Depth is greater than local depth

-5 > 9.3

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

Significant shoaling in Traffic Zone frequented by tug and barge traffic.

**Item Investigation:** 51 ft Sounding

**Item Description:** Charted 51 ft sounding. Pilots Association for Bay and River Delaware requested investigation of a charted 51 ft sounding (chart 12214).

**Source:** NOS prior survey unknown. Pilots Association for Bay and River Delaware.

**AWOIS Position:** None

**Required Investigation:** None

**Radius:** N/A

**Charts Affected:** 12304, 12214

---

**INVESTIGATION**

**Date(s):** September 8, 2000 (DN 252)

**Position Numbers:** HPS Fix # 32310

**SWMB Data Source:** Fe2000\_25/WH05/2000-252/026\_1638/440/28

**Investigation Used:** SWMB

**Surveyed Position:** 38° 46' 40.59" N, 074° 58' 38.74" W.

**Position Determined By:** DGPS

**Investigation Summary:** The 51 ft sounding was developed with SWMB and a least depth of 49 ft was discovered. A large scour is visible in the DTM image, indicating a grounding occurred in this area. This item was submitted as a Danger to Navigation (No. 6), dated March 14, 2001.

---

**CHARTING RECOMMENDATION**

**Recommendation:** The Hydrographer recommends charting a 49 ft sounding at latitude 38° 46' 40.59" N, longitude 074° 58' 38.74" W. *Concur*

*CHART SURVEY SOUNDINGS*



reference\_point4

Offset 0  
Shad Len 0  
Correlating Contact

Correlating Dist 0

SSS Height 0  
 Second Hit  
Con Lat 38-46-40.59 N  
Con Lon 074-58-38.74 W

Development  
Least Depth 15.03 m AWOIS# 0  
Least Depth 49 ft AWOIS Dist 0  
Day of I.D. 252 LD Lat 38-46-40.59 N  
Contact Dist 0 LD Lon 074-58-38.74 W  
I.D Source Fe2000\_25\_WH05\_2000-252\_026\_1638\_44

Comments

Contact Remark  
Investigation SWMB

Charting Rec  
 Chart Item  
The Hydrographer recommends charting representative soundings.

Matching Swath Info  
Line Day Fix Range

VM

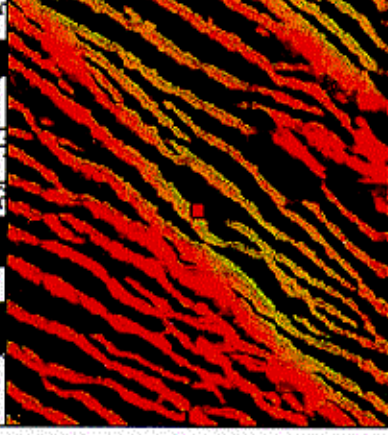
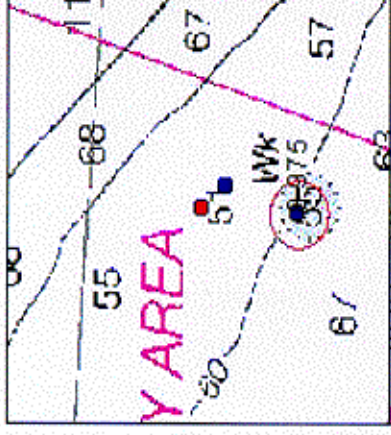
DTON  
 DTON

7. Sounding  
Fixes <Radius

252.0  
252.0  
252.0  
252.0  
252.0

Local Contacts

0 meters width 0 meters height



Resolution

SSS Height 0  
Apparent Height 0.77  
Average Depth 15.9  
Top Depth 0  
Length 0  
Width 0

Significance Criteria

0 > 1 m < 20 m or 10 %  
15.9 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact ht

0.77 > 100 % 0

Multibeam Coverage

Number of Depths is greater than X

13 > 7

Top Depth is greater than local depth

15.9 > 14.9

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

Sounding investigation at request of Pilots Association

**Item Investigation:** 16 ft Sounding

**Item Description:** A Danger To Navigation submitted by WHITING from survey H10917 (1999) reported a 20 ft sounding in the north entrance to Harbor of Refuge. Cape May, NJ - Lewes, DE ferries transit through this entrance.

**Source:** H10917

**AWOIS Position:** 38° 50' 01.67" N, 075° 06' 25.66" W

**Required Investigation:** None

**Radius:** N/A

**Charts Affected:** 12304, 12214

---

**INVESTIGATION**

**Date(s):** July 20, 2000 (DN 202)

**Position Numbers:** HPS Fix # 30402.

**SWMB Data Source:** FE2000\_1\_A/WH05/2000\_202/001\_1404/726/64

**Investigation Used:** SWMB

**Surveyed Position:** 38° 50' 01.67" N, 075° 06' 25.66" W

**Position Determined By:** DGPS

**Investigation Summary:** WHITING survey H10917 (1999) located a significant contact with a least depth of 20 ft. SWMB data was acquired on this item as part of F00467 in 2000. A least depth of 16 ft was determined. This item was submitted as a Danger to Navigation (No. 3), dated March 14, 2001.

*Sheet 1*  
*charts 12214*  
*12214*  
*12304*

---

**CHARTING RECOMMENDATION**

**Recommendation:** The Hydrographer recommends charting a 16 ft sounding in latitude 38° 50' 01.67" N, longitude 075° 06' 25.66" W.

*Concur*

24551.0  
 Day No. 227  
 Offset 0  
 Shad Len 0  
 Correlating Contact

Correlating Dist 0  
 SSS Height 1.4  
 Second Hit  
 Con Lat 38-50-01.98 N  
 Con Lon 075-06-25.49 W

**Development**  
 Least Depth 5.01 m AWOIS# 0  
 Least Depth 16 ft AWOIS Dist 0  
 Day of LD 202 LD Lat 38-50-01.67 N  
 Contact Dist 10.4 LD Lon 075-06-25.66 W  
 LD Source Fe2000\_1\_A\_WH05\_2000-202\_001\_1404\_7

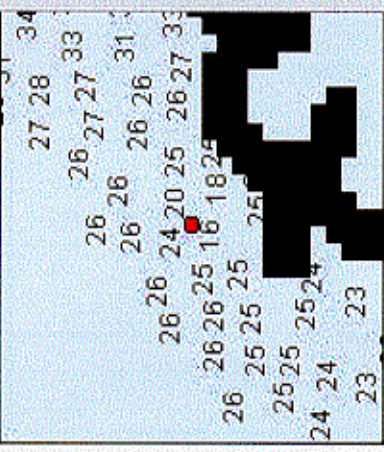
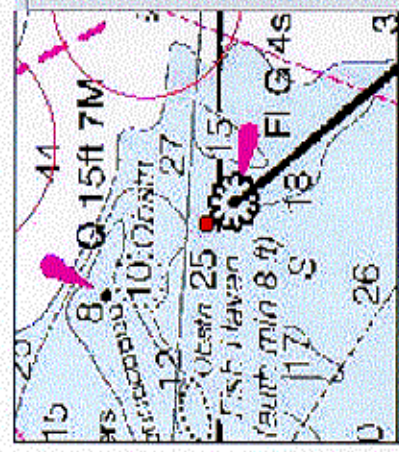
**Comments**  
 Contact Remark 0\_NFI +DEV Fatho Hit Pile Shape  
 Investigation SWMB  
 Charting Rec  
 Chart Item  
 The Hydrographer recommends charting representative soundings.

Matching Swath Info  
 Line Day Fix Range  
 VM

DTON ->DTON  
 DTON  
 4. Sounding  
 Fixes <Radius  
 2  
 202 0  
 202 0  
 202 0  
 202 0

Local Contacts

0 meters width 0 meters height



**Resolution**  
 SSS Height 1.4  
 Apparent Height 3.16  
 Average Depth 8  
 Top Depth 0  
 Length 0  
 Width 0

**Significance Criteria**  
 1.4 > 1 m < 20 m or 10 %  
 6.6 < 25  
 Both Criteria must be red for Auto-Signify

Auto-Signify  Significant

**Resolution Criteria**  
 Relief is greater than X% of contact ht 3.16 > 100 % 1.4  
 Multibeam Coverage  
 Number of Depths is greater than X 49 > 7  
 Top Depth is greater than local depth 6.6 > 5.7  
 Any green means resolved

Auto-Resolve  Resolved

**Resolution Notes**  
 20 ft sounding identified in H-10917 and submitted as DToN.

**Item Investigation:** Tanker Vessel (T/V) MICHAEL Grounding Site**Item Description:** T/V MICHAEL grounding site.**Source:** Captain Vaughan, Pilots Association for Bay and River Delaware.**Item Positions:** Position No.1 @ 38° 42' 23.94" N, 074° 58' 41.99" W. Position No. 2 @ 38° 42' 31.98"N, 074° 58' 24.35"W**Required Investigation:** None**Radius:** N/A**Charts Affected:** 12214*Sheet 6  
Chart 12214*

---

**INVESTIGATION****Date(s):** August 10,200 (VBES, DN 223); September 8, 2000 (SWMB, DN 252)**Position Numbers:** DN 223, HPS Fix # 996 (45 ft @ position no. 1); and DN 252, HPS Fix # 73980 (48 ft @ position no. 2).**SWMB Data Source:** TVMichael/WH05/2000-252/043\_1914/733/31**Investigation Used:** VBES, SWMB**Surveyed Positions:** See item positions above.**Position Determined By:** DGPS**Investigation Summary:** The grounding site was initially investigated using VBES to delineate the extent of shoaling. The area was then fully covered with SWMB. Least depths of <sup>46</sup>45 ft at position no. 1, and 48 ft at position no. 2 were determined. See Dangers to Navigation report dated September 13, 2000.

---

**CHARTING RECOMMENDATION****Recommendation:** The Hydrographer recommends charting a 48 ft sounding at latitude 38° 42' 32.00" N, longitude 074° 58' 24.30" W, and a <sup>46</sup>45 ft sounding at latitude 38° 42' 23.94" N, longitude 74° 58' ~~41.99~~" W.*39.89**Concur w/ Clarification.  
Chart Survey Soundings**03*

**TVM\_grounding**

Offset 0  
Shad Len 0  
Correlating Contact

Correlating Dist 0

SSS Height 0

Second Hit

Con Lat 38-42-31.98 N  
Con Lon 074-58-24.35 W

**Development**

Least Depth 14.74 m AWOIS# 0  
Least Depth 48 ft AWOIS Dist 0  
Day of LD 252 LD Lat 38-42-31.98 N  
Contact Dist 0 LD Lon 074-58-24.35 W  
LD Source TVMichael\_WI105\_2000-252\_043\_1914\_73

**Comments**

Contact Remark  
Investigation

Charting Rec  
 Chart Item

The Hydrographer recommends charting representative soundings.

Matching Swath Info  
Line Day Fix Range

VM

DTON  
 DTON

8. Sounding  
Fixes <Radius

223 710  
223 710  
252 0  
252 0  
252 0

Local Contacts

0 meters width 0 meters height

**Resolution**

SSS Height 0  
Apparent Height 0.52  
Average Depth 15.5  
Top Depth  
Length 0  
Width 0

**Significance Criteria**

0 > 1 m < 20 m or 10 %  
15.5 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

**Resolution Criteria**

Relief is greater than X% of contact ht.

0.52 > 100 % 0

Multibeam Coverage

Number of Depths is greater than X

19 > 7

Top Depth is greater than local depth

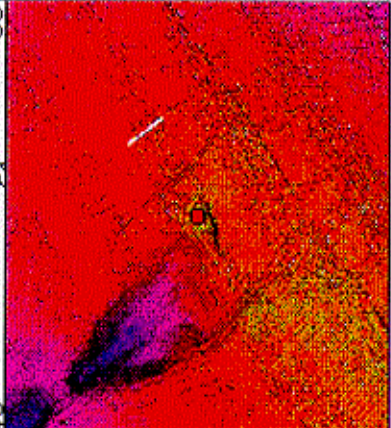
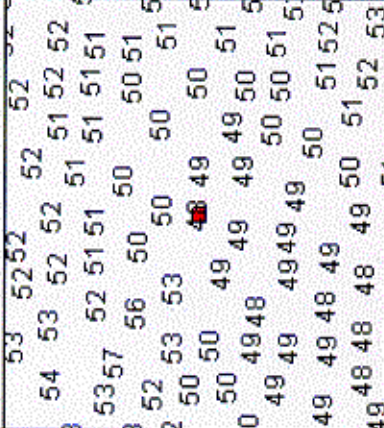
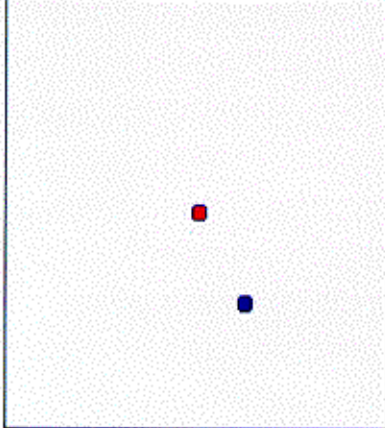
15.5 > 14.7

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

TVM Michael investigation. Grounding apparent in DTM imagery.



**TVM\_grounding\_2**

Offset 0  
 Shad Len 0  
 Correlating Contact

Correlating Dist 0

SSS Height 0

Second Hit  
 Con Lat 38-42-23.94 N  
 Con Lon 074-58-41.99 W

**Development**

Least Depth 13.9 m AWOIS# 0  
 Least Depth 45 ft AWOIS Dist 0  
 Day of LD 223 LD Lat 38-42-23.94 N  
 Contact Dist 0 LD Lon 074-58-41.99 W  
 I.D Source

**Comments**

Contact Remark

Investigation

Charting Rec

Chart Item

The Hydrographer recommends charting representative soundings.

**Matching Swath Info**

Line Day Fix Range

VM

DTON  
 DTON  
 DTON

9. Sounding

Fixes <Radius

223 996  
 252 0

Local Contacts

**Resolution**

SSS Height 0  
 Apparent Height 0.44  
 Average Depth 14.4  
 Top Depth  
 Length 0  
 Width 0

**Significance Criteria**

0 > 1 m < 20 m or 10 %  
 14.4 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

**Resolution Criteria**

Relief is greater than X% of contact ht.

0.44 > 100 % 0

Multibeam Coverage

Number of Depths is greater than X

2 > 7

Top Depth is greater than local depth

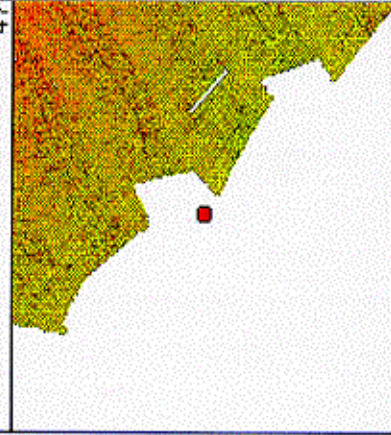
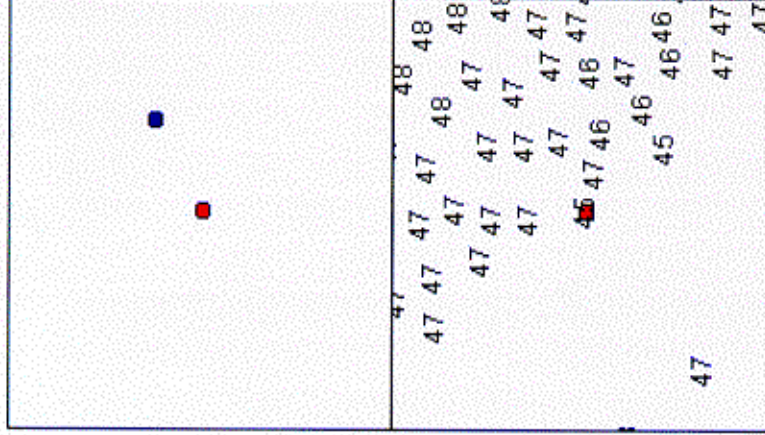
14.4 > 13.9

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

TVM Michael grounding investigation.



0 meters width 0 meters height

**Item:** Uncharted Rock**Item Description:** Contact found during WHITING survey F00453 (1999) with 200% side scan sonar and developed with VBES.**Source:** F00453**AWOIS Position:** N/A**Required Investigation:** None**Radius:** None**Charts Affected:** 12304

---

**INVESTIGATION**
**Date(s):** September 7, 2000 (DN 251)**Position Numbers:** HPS Fix # 331~~64~~<sup>77</sup>*Sheet 9  
Chart 12304***SWMB Data Source:** Fe2000\_24/WH05/2000-251/040\_1923/412/62**Investigation Used:** SWMB**Surveyed Positions:** 39° 02' 19.27" N, 075° 09' 59.03" W**Position Determined By:** DGPS**Investigation Summary:** SWMB on contacts 230\_005\_1406\_1, 230\_006\_1416\_1, 230\_006\_1413\_1, and 230\_008\_1555\_1. A contact resembling a rock with least depth of 34 ft was located. This item was submitted as a Danger to Navigation (No. 1), March 14, 2001.

---

**CHARTING RECOMMENDATION**
**Recommendation:** The Hydrographer recommends charting a rock notation with least depth of 34 ft at 39° 02' 19.27" N, 075° 09' 59.03" W.*Do Not Concern - INSIGNIFICANT  
CHART SURVEY SOUNDINGS**See AWOIS item #9992  
(add notation "rky")  
EJV 3/20/02*

230\_005\_1406\_1

Offset 83

Shad Len 0

Correlating Contact

230\_006\_1416\_1

Correlating Dist

11

SSS Height 0

Second Hit

Con Lat 39-02-19.31 N

Con Lon 075-09-58.68 W

Development

Least Depth 10.48 m AWOIS# 0

Least Depth 34 ft AWOIS Dist 0

Day of LD 251 LD Lat 39-02-19.19 N

Contact Dist 9.4 LD Lon 075-09-59.03 W

LD Source Fe2000\_24\_WHO5\_2000-251\_040\_1923\_41

Comments

0, +DEV\_hyd poss quarry rock

Contact Remark

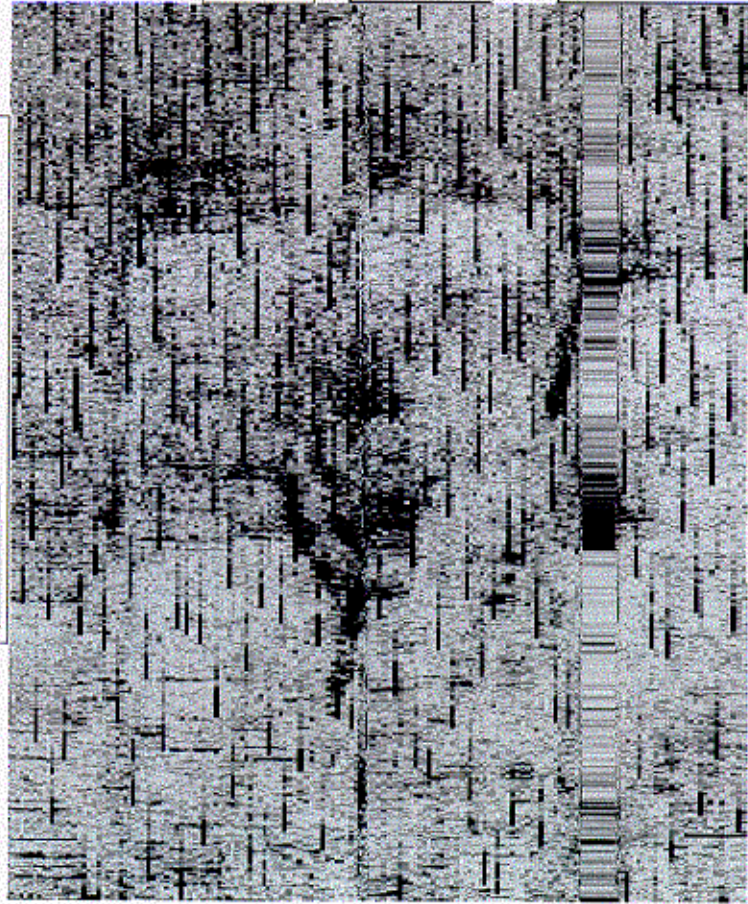
Investigation

Charting Rec

Chart Item  
OBSTN

chart "obstruction, least depth known by sounding only, 34" at surveyed position.

Matching Swath Info  
Line Day Fix Range



DTON >DTON

DTON

Fixes <Radius

2

251 0

251 0

251 0

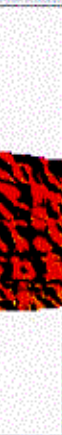
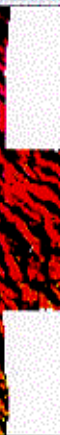
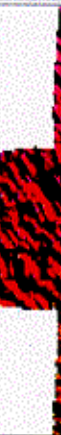
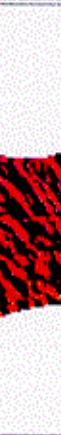
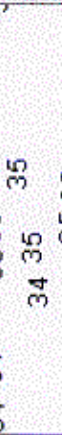
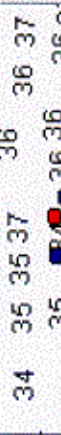
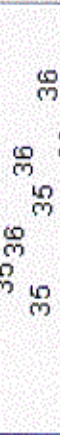
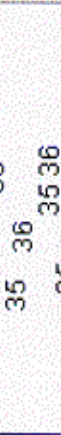
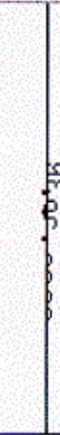
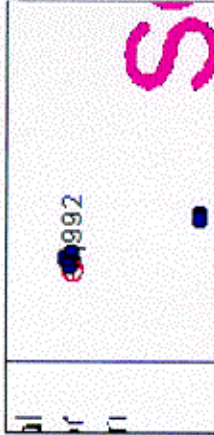
251 0

Local Contacts

230\_006\_1413\_1 11.6

230\_006\_1416\_1 10.9

230\_008\_1555\_1 18.0



Resolution

SSS Height 0

Apparent Height 0.84

Average Depth 10.9

Top Depth 0

Length 0

Width 0

Significance Criteria

0 > 1 m < 20 m or 10 %

10.9 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify

Significant

Resolution Criteria

Relief is greater than X% of contact ht.

0.84 > 100 % 0

Multibeam Coverage

Number of Depths is greater than X

40 > 7

Top Depth is greater than local depth

10.9 > 10.3

Any green means resolved

Auto-Resolve

Resolved

Resolution Notes

Separate rock grouping south of AWOIS 9992. Investigated in F-00453.



230\_006\_1416\_1

Offset 72

Shad Len 0

Correlating Contact

230\_005\_1406\_1

Correlating Dist 11

SSS Height 0

Second Hit

Con Lat 39-02-18.98 N

Con Lon 075-09-58.83 W

Development

Least Depth 10.48 m AWOIS# 0

Least Depth 34 ft AWOIS Dist 0

Day of LD 251 LD Lat 39-02-19.19 N

Contact Dist 8.1 LD Lon 075-09-59.03 W

LD Source Fe2000\_24\_WH05\_2000-251\_040\_1923\_41

Comments

0, +DEV HYD, poss quarry rock

Contact Remark

Investigation

SWMB

Charting Rec

Chart Item  
chart "obstruction, least depth known by sounding only, 34'" at surveyed position.

Matching Swath Info

Line Day Fix Range



VM

DTON

DTON

>DTON

Fixes <Radius

2

251 0

251 0

251 0

251 0

Local Contacts

230\_005\_1406\_1 10.9

230\_006\_1413\_1 14.0

230\_008\_1555\_1 16.8

Resolution

SSS Height 0

Apparent Height 0.75

Average Depth 10.9

Top Depth 0

Length 0

Width 0

Significance Criteria

0 > |1 m < 20 m or 10 %

10.9 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact ht

0.75 > 100 % 0

Multibeam Coverage

Number of Depths is greater than X

36 > 7

Top Depth is greater than local depth

10.9 > 10.2

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

Separate rock grouping south of AWOIS

9992, Investigated in F-00453.



9992

35 36

35 35 36

35 35 35 37 36 36 37

34 34 34 35 36 36

34 34 35 36 36 36 36

33 34 34 35 35 35 35 35

34 34 34 35 35 36 36 36

34 35 35

34 34 34 35

34 34 34 35

34 34 35



230\_006\_1413\_1

Offset -63

Shad Len 0

Correlating Contact

230\_005\_1406\_1

Correlating Dist 11.6

SSS Height 0

Second Hit

Con Lat 39-02-19.11 N

Con Lon 075-09-58.27 W

Development

Least Depth 10.68 m AWOIS# 0

Least Depth 35 ft AWOIS Dist 0

Day of LD 251 LD Lat 39-02-19.14 N

Contact Dist 7.1 LD Lon 075-09-58.56 W

LD Source Fe2000\_24\_WH05\_2000-251\_044\_1912\_37

Comments

Contact Remark 0, +DEV hyd poss quarry rock

Investigation SWMB

Charting Rec

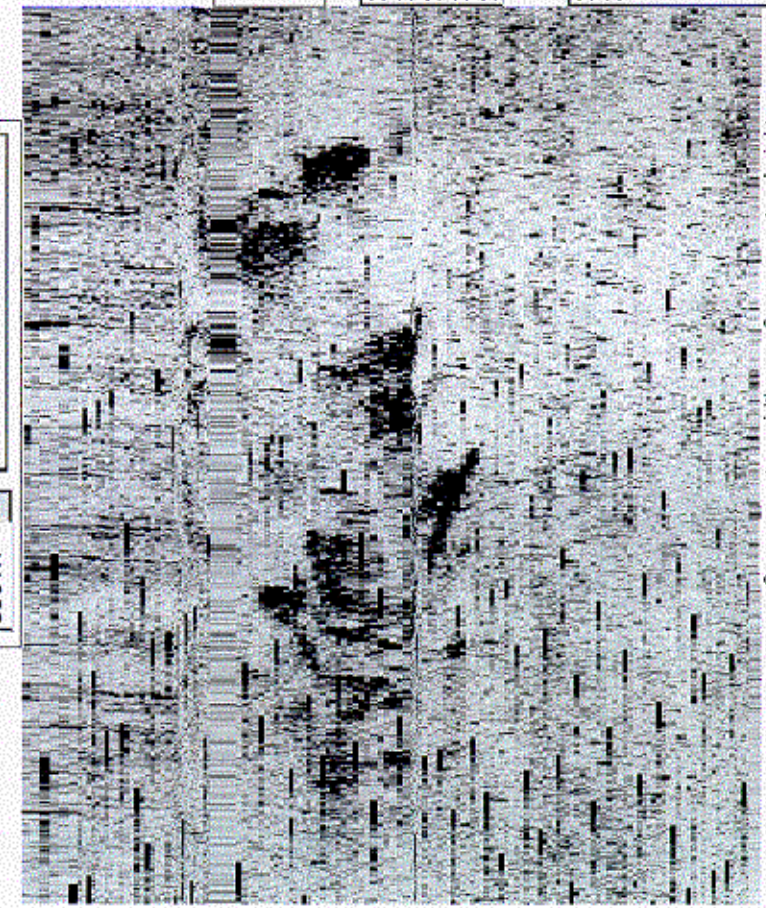
Chart Item chart "obstruction, least depth known by sounding only, 34" at surveyed position.

OBSTN

Matching Swath Info

Line Day Fix Range

VM



DTON

DTON

Fixes <Radius

2

251 0

251 0

251 0

251 0

Local Contacts

230\_005\_1406\_1 11.6

230\_006\_1416\_1 14.0

Resolution

SSS Height 0

Apparent Height 0.86

Average Depth 10.9

Top Depth 0

Length 0

Width 0

Significance Criteria

0 > 1 m < 20 m or 10 %

10.9 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact ht

0.86 > 100 % 0

Multibeam Coverage

Number of Depths is greater than X

43 > 7

Top Depth is greater than local depth

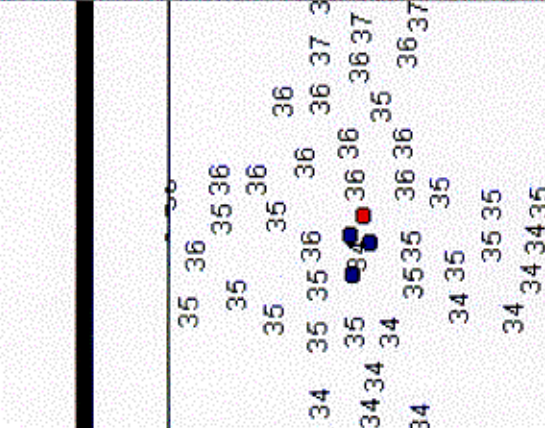
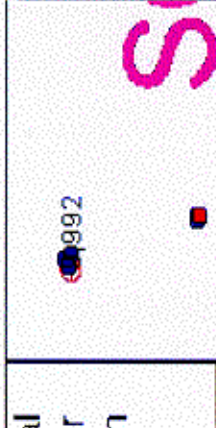
10.9 > 10.4

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

Separate rock grouping south of AWOIS 9992. Investigated in F-00453.



230\_008\_1555\_1

Offset -22

Shad Len 0

Correlating Contact

230\_006\_1416\_1

Correlating Dist

16.9

SSS Height 0.7

Second Hit

Con Lat 39-02-19.27 N

Con Lon 075-09-59.43 W

Development

Least Depth 10.48 m AWOIS# 0

Least Depth 34 ft AWOIS Dist 0

Day of LD 251 LD Lat 39-02-19.19 N

Contact Dist 9.7 LD Lon 075-09-59.03 W

LD Source Fe2000\_24\_W1H05\_2000-251\_040\_1923\_41

Comments

Contact Remark  +Dev hyd poss quarry rock

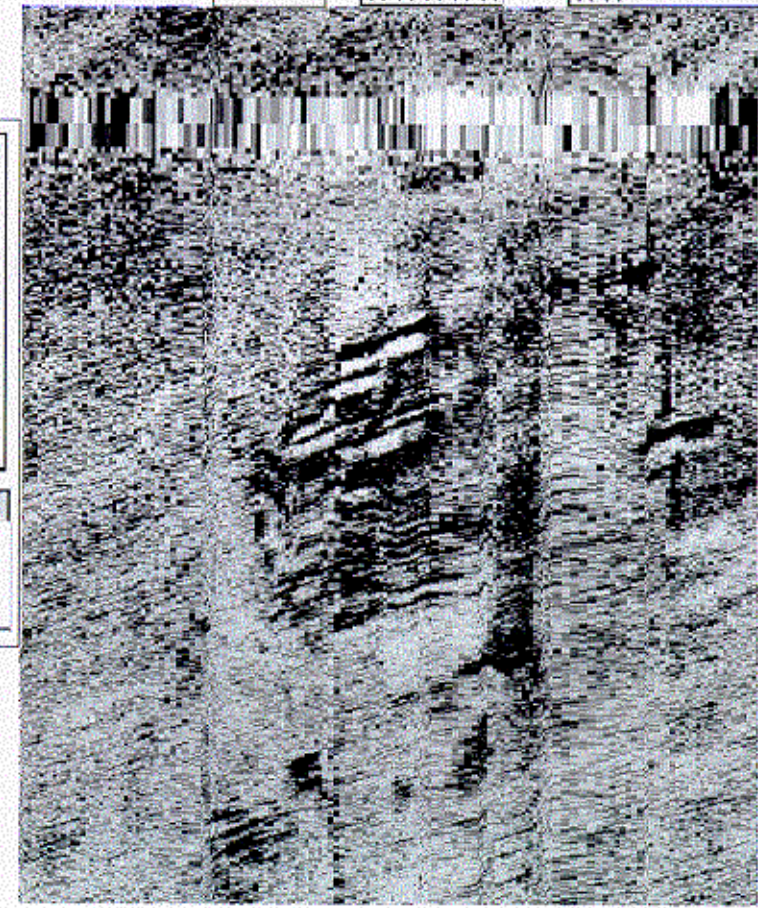
Investigation SWMB

Charting Rec

Chart Item chart "obstruction, least depth known by sounding only, 34" at surveyed position.

Matching Swath Info

Line Day Fix Range



DTON

DTON

1. Rock

Fixes <Radius

251 0

251 0

251 0

251 0

251 0

Local Contacts

230\_005\_1406\_1 18.0

230\_006\_1416\_1 16.8

Resolution

SSS Height 0.7

Apparent Height 0.61

Average Depth 10.8

Top Depth 0

Length 0

Width 0

Significance Criteria

0.7 > 1 m < 20 m or 10 %

10.1 < 25

Both Criteria must be red for Auto-Signity

Auto-Signity Significant

Resolution Criteria

Relief is greater than X% of contact ht.

0.61 > 100 % 0.7

Multibeam Coverage

Number of Depths is greater than X

26 > 7

Top Depth is greater than local depth

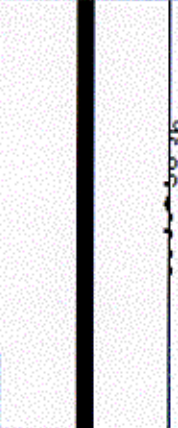
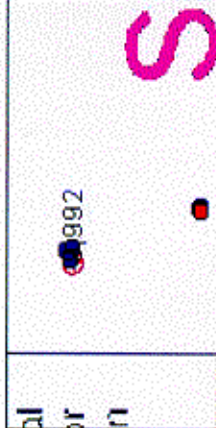
10.1 > 10.2

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

Separate rock grouping south of AWOIS 9992. Investigated in F-00453.



**N. COMPARISON WITH THE CHART***SEE ALSO THE EVALUATION REPORT***N.1.** Five NOS charts are affected by this survey:

Chart No. 12214

Cape May to Fenwick Island

~~45<sup>th</sup> Ed., October 28, 2000~~

1:80,000

*42<sup>nd</sup> Ed., Sept 25, 1999*

Chart No. 13003

Delaware Bay

40<sup>th</sup> Ed., 20 February, 1999~~1:80,000~~*1:200,000*

Chart No. 12304

Delaware Bay

41<sup>st</sup> Ed., 22 April, 2000

1:80,000

Chart No. 12200

Cape May To Cape Hatteras

46<sup>th</sup> Ed., November 4, 2000

1:419,706

Chart No. 12216

Cape Henlopen to Indian River Inlet

25<sup>th</sup> Ed., 15 June, 1996

1:40,000

Chart No. 12317

Cape May Harbor

30<sup>th</sup> Ed., 3 February, 1996

1:10,000

**N.2.(a)** One Danger to Navigation report addressing eight items was submitted March 14, 2001. One Danger to Navigation report for the T/V MICHAEL grounding site was submitted September 13, 2000. See Appendix A. - *attached to report. SEE ALSO THE EVALUATION REPORT*

**N.2.(b)** Five areas of shoaling were located during these field examinations. See Section M (16 ft Sounding, 30 ft Shoal, 51 ft Sounding, T/V MICHAEL grounding site, and Cape May Inlet).

**N.3.(a)** In general, surveyed soundings showed good agreement with charted soundings. See Section M for detailed discussion by item.

**N.3.(b)** Shoaling within the limits of these field examinations is discussed in Section M. The Hydrographer notes in particular the shoal in the outbound lane of the Cape Henlopen to Delaware Bay traffic lane identified in the T/V MICHAEL grounding site investigation. This outbound lane is used by the largest deep draft vessels in the Delaware Bay. Other areas specifically include the two-way traffic zone southeast of Cape May, frequented typically by tug and barge traffic. Also noted is the significant shoaling at the entrance to Cape May Inlet. Note that the Cape May Inlet data is under a separate HPS project (capemay, HPS Sheet ~~24~~<sup>12</sup>) in the digital data.

**N.3.(c)** Strong tidal currents were observed throughout the survey area, particularly where field examinations occurred in geographically constricted areas (i.e. Cape May Inlet). Evidence of strong currents (i.e. sand waves) was also observed in side scan and DTM images.

**N.3.(d)** No controlled channels are within the limits of these field examinations.

**N.3.(e)** See Section M and accompanying chartlets for shoal depths located within the Delaware Bay pilot and precautionary areas.

**N.4.(a)** All non-sounding features within the survey areas are adequately charted, unless discussed otherwise in Section M.

**N.4.(b)** See Section M for features not found during the survey.

**N.4.(c)** No additional features with "PA", "ED", "PD", or "Rep" notations, not already discussed in Section M, were included in these field examinations.

**N.4.(d)** No wrecks or obstructions, not already discussed in Section M, were included in these field examinations.

**N.4.(e)** No bridges, overhead cables, or submerged pipelines occur within the limits of these field examinations.

**N.4.(f)** One submerged cable area is charted within the limits of the Cape May Inlet field examination. No submarine cables or associated crossing signs were observed.

**N.4.(g)** No pipelines or associated warning signs ashore were observed during these field examinations.

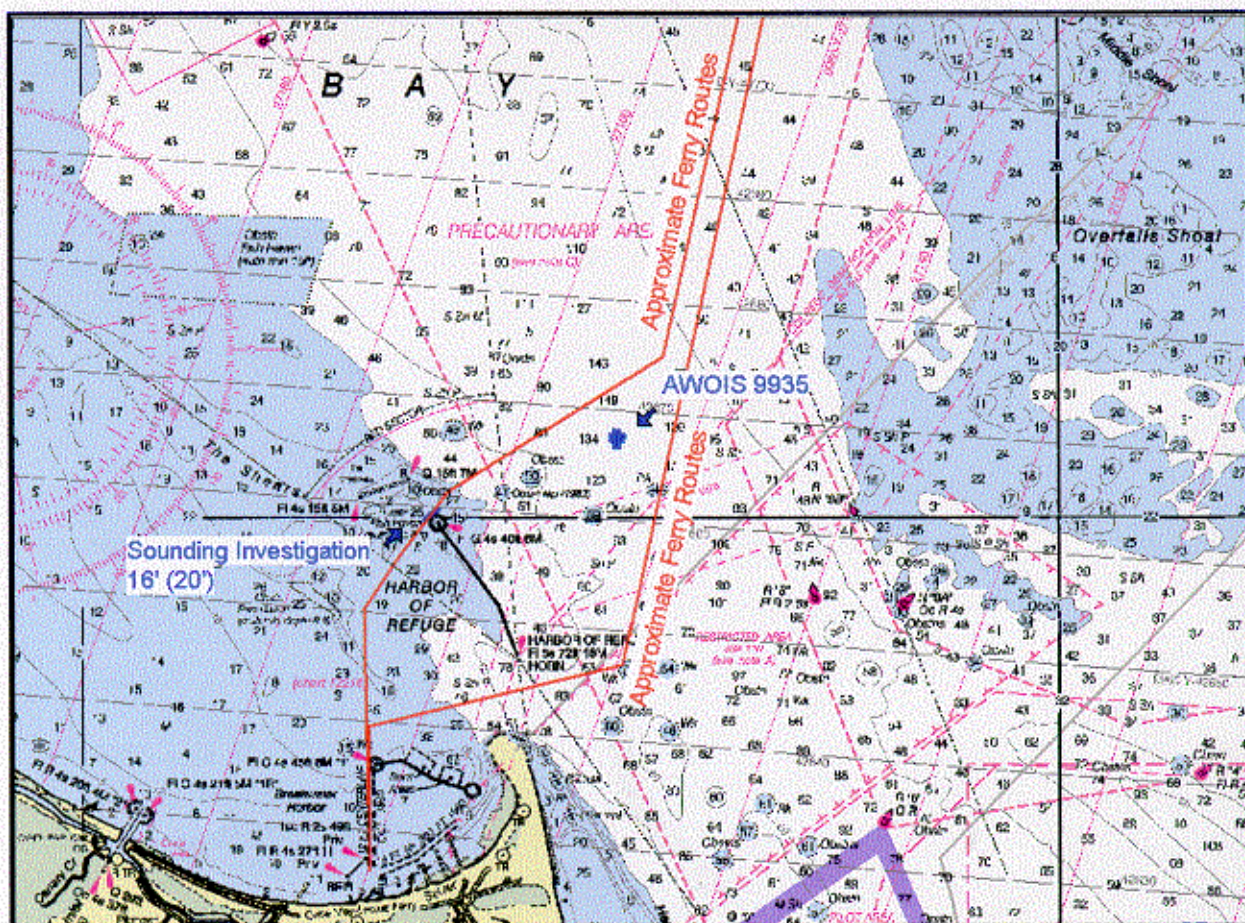


Figure 5: Lewes, DE & Cape May, NJ Ferry Routes

- N.4. No ferry terminals occur within the limits of these field examinations.
- N.5. No changes in scale, coverage, or format of the applicable NOS charts are recommended.
- N.6. No non-floating aids or landmarks are recommended for charting, revision, or deletion.

**O. ADEQUACY OF SURVEY** *SEE ALSO THE EVALUATION REPORT*

**O.1.** Data from these field examinations are complete and should supersede charted information.

**O.2.** No part of these field examinations are incomplete or substandard.

**P. AIDS TO NAVIGATION**

No floating, non-floating, or fixed aids to navigation occur within the field examination limits.

**Q. STATISTICS**

<b>Q.1.a.</b>	Linear Nautical Miles of SSS .....	79.77
<b>Q.1.b.</b>	Linear Nautical Miles of VBES .....	20
	Linear Nautical Miles of SWMB .....	62.43
<b>Q.1.c.</b>	Square Nautical Miles of VBES .....	1.16
<b>Q.1.d.</b>	Square Nautical Miles of SSS .....	3.25
	Square Nautical Miles of SWMB .....	1.4925
<b>Q.2.a.</b>	Days of Data Acquisition .....	15
<b>Q.2.b.</b>	Total Number of Soundings .....	85,524
<b>Q.2.c.</b>	Number of Soundings on Final Field Sheet .....	N/A
<b>Q.2.d.</b>	Number of Detached Positions .....	12
<b>Q.2.d.</b>	Number of Bottom Samples .....	0
<b>Q.2.e.</b>	Number of Velocity Casts .....	26
<b>Q.2.f.</b>	Number of Tide Stations Installed .....	0

**R. MISCELLANEOUS** *SEE ALSO THE EVALUATION REPORT*

No bottom samples were collected for these field examinations.

**S. RECOMMENDATIONS**

No further survey work is recommended.

*DO NOT CONCERN  
SEE SECTION M. OF THE  
EVALUATION REPORT*

**T. REFERRAL TO REPORTS**    *SEE ALSO THE EVALUATION REPORT*

A Coast Pilot Report was submitted to N/CS26. See Appendix J.

A Tide Station Level Report for station 855-4399 (Mahon River Entrance) was submitted to N/OPS1 at the conclusion of project OPR-D392-WH.

*TWO DANGER TO NAVIGATION REPORTS ARE APPENDED.*



**REPORT OF DANGER TO NAVIGATION** (March 14, 2001)

**Registry Number:** F00467  
**State:** New Jersey - Delaware  
**Locality:** Approaches to Delaware Bay  
**Sub-locality:** Delaware Bay and Vicinity  
**Project Number:** OPR-D392-WH  
**Survey Date(s):** July 17 - September 12, 2000

Soundings are reduced to Mean Lower Low Water (MLLW) using Verified Water Levels. Horizontal datum is NAD 83.

**Affected Charts:** 12214, 43<sup>rd</sup> Edition, December 16, 2000, 1:80,000, NAD83  
12216, 25<sup>th</sup> Edition, June 15, 1996, 1:40,000, NAD83  
12304, 41<sup>th</sup> Edition, April 22, 2000, 1:80,000, NAD83  
12317, 30<sup>th</sup> Edition, February 3, 1996 1:10,000, NAD83  
12318, 39<sup>th</sup> Edition, September 18, 1999

The following tables are separated by applicable chart. Remarks for removal or addition of items are provided.

Questions concerning this report should be directed to the Chief, Atlantic Hydrographic Branch at 757-441-6746.

DANGER TO NAVIGATION

Affected Chart: 12214

Feature	Depth	Latitude	Longitude	Action
#3, Sounding	16 feet (5.01 meters)	38-50-01.67 N	075-06-25.66 W	Chart, DToN
#4, Obstruction	<del>30</del> feet (9.30 meters) 31	38-55-44.84 N	074-44-53.75 W	Chart, DToN
#5, Wreck	48 feet (14.60 meters)	38-55-39.94 N	074-45-33.62 W	Chart, DToN
#6, Sounding	49 feet (15.03 meters)	38-46-40.59 N	074-58-38.74 W	Chart, DToN
# 7, Sounding	30 feet (9.2 meters)	38-57-46.76 N	074-42-56.9 W	Chart, DToN

DANGER TO NAVIGATION

Affected Chart: 12216

Feature	Depth	Latitude	Longitude	Action
#3, Sounding	16 feet (5.01 meters)	38-50-01.67 N	075-06-25.66 W	Chart, DToN

DANGER TO NAVIGATION

Affected Chart: 12317

Feature	Depth	Latitude	Longitude	Action
#8, Sounding	11 feet (3.37 meters)	38-56-15.50 N	074-51-52.06 W	Chart, DToN

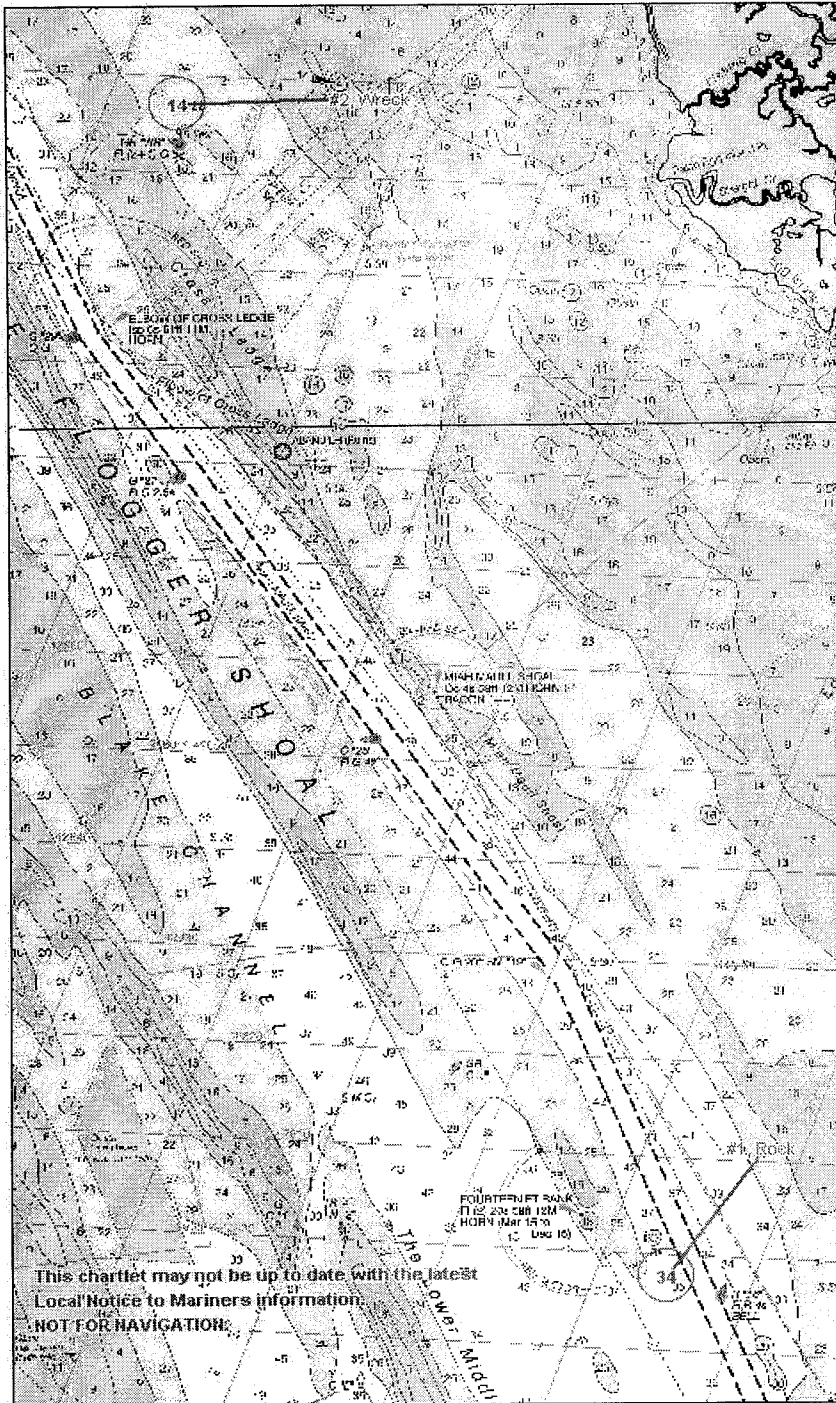
DANGER TO NAVIGATIONAffected Chart: **12304**

Feature	Depth	Latitude	Longitude	Action
#1, Rock	34 feet(10.48 meters)	39-02-19.19 N	075-09-59.03 W	Chart, DToN
#2, Wreck	14 feet (4.37 meters)	39-12-53.40 N	075-15-17.04 W	Chart, DToN
#3, Sounding	16 feet (5.01 meters)	38-50-01.67 N	075-06-25.66 W	Chart, DToN
#6, Sounding	49 feet (15.03 meters)	38-46-40.59 N	074-58-38.74 W	Chart, DToN

DANGER TO NAVIGATIONAffected Chart: **12318**


Feature	Depth	Latitude	Longitude	Action
#7, Sounding	30 feet (9.2 meters)	38-57-46.76 N	074-42-56.9 W	Chart, DToN

All DToN's lie within the undifferentiated boundaries of chart 12200 and 13003.



Chartlet 1 of 3 Chart 12304. Data from NOAA Hydrographic Survey F-00467. Soundings in feet.

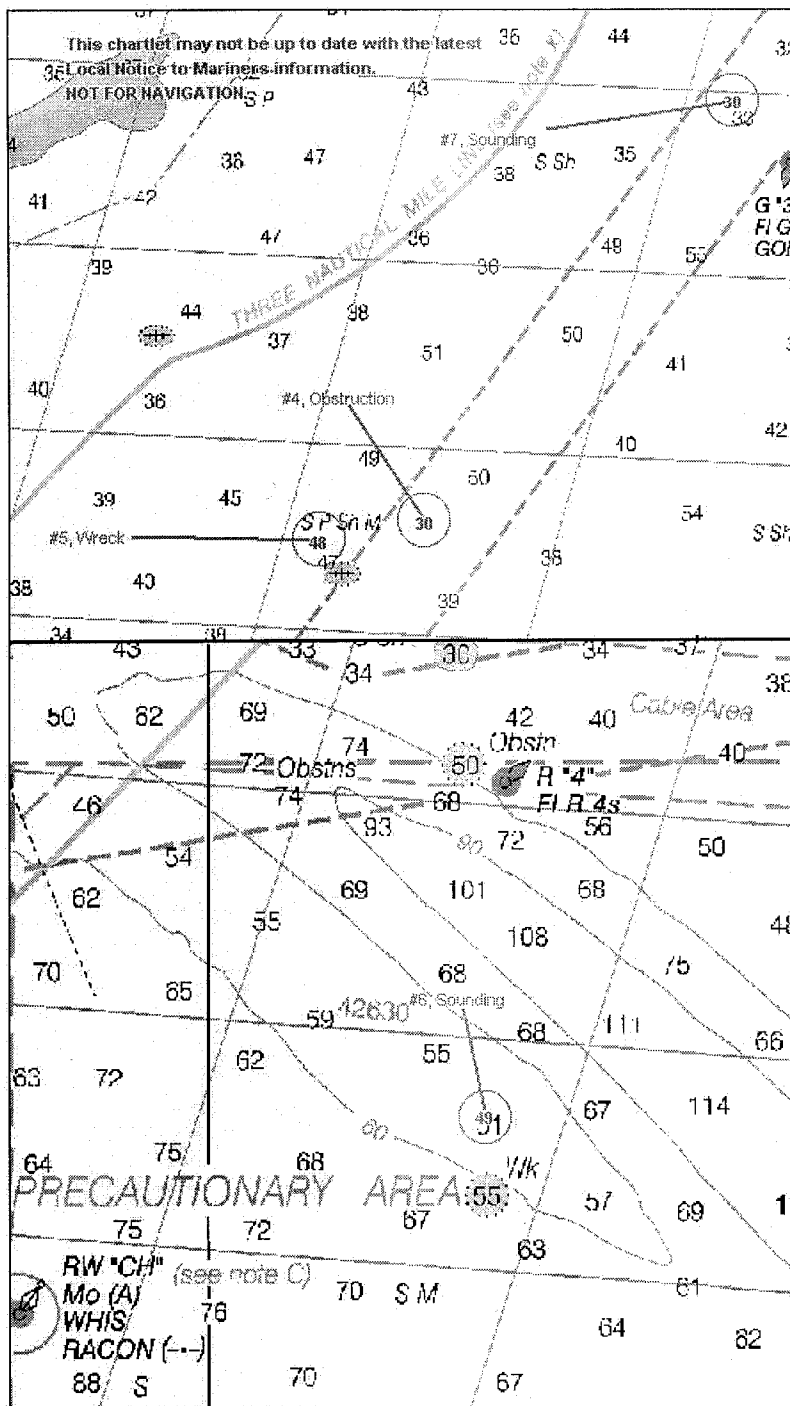
**NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SERVICE**



**NOAA Ship WHITING**  
LCDR Gerd F. Glang  
Commanding  
July 17 to  
September 12, 2000

Sounding Units: Meters  
Sounding Datum: MLLW  
Horizontal Datum: NAD 83  
Projection: UTM 18  
Central Meridian: 08° 00' 00"  
Scale Factor: 0.9996

Project: CPR-0392-WH  
Survey: F-00467  
State: Delaware-New Jersey  
Locality: Approaches to Delaware Bay  
Sub-locality: Delaware Bay and Vicinity  
Survey Scale: 1:10,000




**Chartlet 2 of 3** Chart 12214. Data from NOAA Hydrographic Survey F-00467. Soundings in feet.

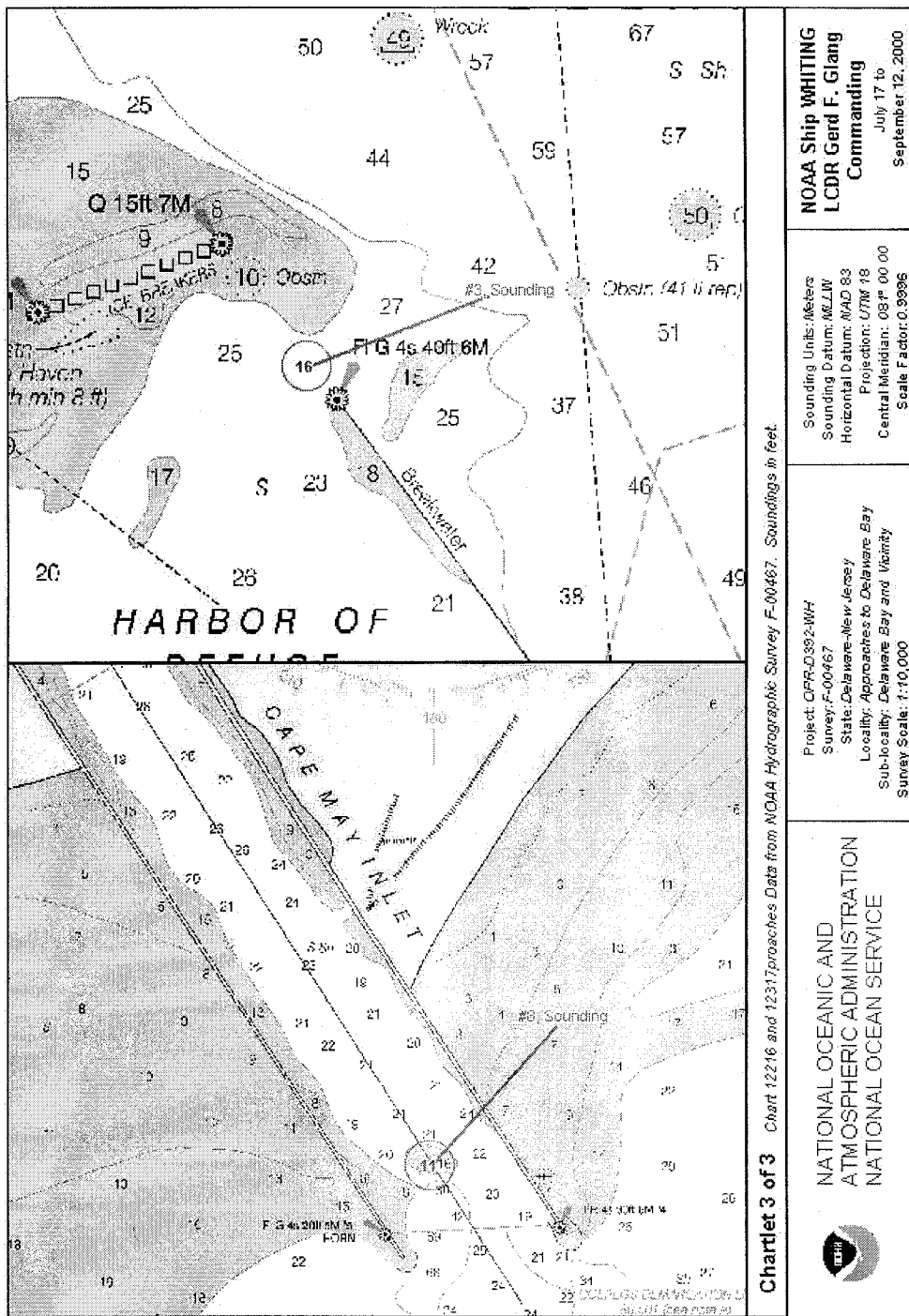
**NOAA Ship WHITING**  
LCDR Gerd F. Glang  
Commanding  
July 17 to  
September 12, 2000

Sounding Units: Meters  
Sounding Datum: MZLW  
Horizontal Datum: NAD 83  
Projection: UTM 18  
Central Meridian: 08° 00' 00"  
Scale Factor: 0.9996

Project: OPR-D392-WH  
Survey: F-00467  
State: Delaware-New Jersey  
Locality: Approaches to Delaware Bay  
Sub-locality: Delaware Bay and Vicinity  
Survey Scale: 1:10,000

**NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION**  
**NATIONAL OCEAN SERVICE**





**NOAA Ship WHITING**  
**LCDR Gerd F. Glang**  
**Commanding**  
 July 17 to  
 September 12, 2000

Sounding Units: Meters  
 Sounding Datum: MLLW  
 Horizontal Datum: NAD 83  
 Projection: UTM 18  
 Central Meridian: 084° 00' 00"  
 Scale Factor: 0.9996

Project: OPR-0392-WH  
 Survey: F-00467  
 State: Delaware-New Jersey  
 Locality: Approaches to Delaware Bay  
 Sub-locality: Delaware Bay and Vicinity  
 Survey Scale: 1:10,000

**Chartlet 3 of 3** Chart 12216 and 12317, approaches Data from NOAA Hydrographic Survey F-00467. Soundings in feet.

**NATIONAL OCEANIC AND  
 ATMOSPHERIC ADMINISTRATION  
 NATIONAL OCEAN SERVICE**



230\_008\_1555\_1

Offset -22

Shad Len 0

Correlating Contact

230\_006\_1416\_1

Correlating Dist 16.9

SSS Height 0.7

Second Hit

Con Lat 39-02-19.27 N

Con Lon 075-09-59.43 W

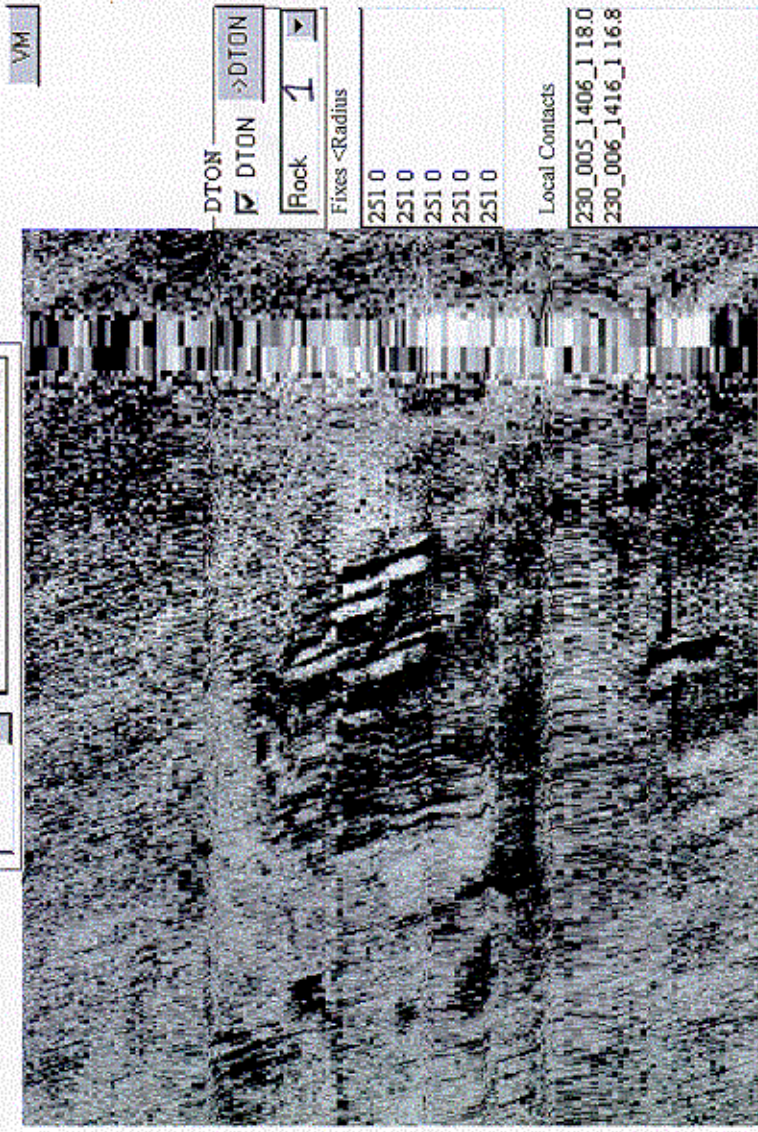
Development

Least Depth 10.48 m AWOIS#  
 Least Depth 34 ft AWOIS Dist 0  
 Day of LD 251 LD Lat 39-02-19.19 N  
 Contact Dist 9.7 LD Lon 075-09-59.03 W  
 LD Source Fe2000\_24\_w105\_2000-251\_040\_1923\_41

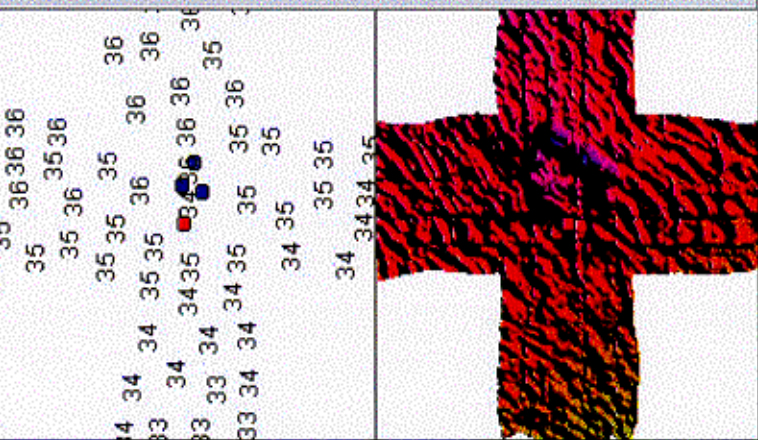
Comments

Contact Remark  
 Investigation +Dev hyd poss quarry rock  
 SWMB  
 Charting Rec chart "obstruction, least depth known by sounding only, 34" at surveyed position.  
 Chart Item

Matching Swath Info  
 Line Day Fix Range



DTON >DTON  
 DTON  
 Rock 1  
 Fixes <Radius  
 251 0  
 251 0  
 251 0  
 251 0  
 251 0  
 Local Contacts  
 230\_005\_1406\_1 18.0  
 230\_006\_1416\_1 16.8



Resolution

SSS Height 0.7  
 Apparent Height 0.61  
 Average Depth 10.8  
 Top Depth  
 Length 0  
 Width 0

Significance Criteria

0.7 > 1 m < 20 m or 10 %  
 10.1 < 25

Both Criteria must be red for Auto-Signity

Auto-Signity Significant

Resolution Criteria

Relief is greater than X% of contact ht

0.61 > 100 % 0.7

Multibeam Coverage

Number of Depths is greater than X

26 > 7

Top Depth is greater than local depth

10.1 > 10.2

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

Separate rock grouping south of AWOIS 9992.

238\_042\_2036\_1

Offset -13

Shad Len 0

Correlating Contact

238\_050\_2010\_1

Correlating Dist

7.2

SSS Height 1.4

Second Hit

Com Lat 39-12-53.46 N

Com Lon 075-15-17.37 W

Development

Least Depth 4.37 m AWOIS#  
 Least Depth 14 ft AWOIS Dist 0  
 Day of LD 251 LD Lat 39-12-53.4 N  
 Contact Dist 8.1 LD Lon 075-15-17.04 W  
 LD Source Fe2000\_24\_WHO5\_2000-251\_003\_1601\_49

Comments

Contact Remark  
 Investigation  
 +DEV hyd good hard hit in search a  
 SWMB

Charting Rec

Chart Item  
 WRK  
 chart "Wreck, least depth known  
 by sounding only, 1.4m" at surveyed  
 position.

Matching Swath Info  
 Line Day Fix Range



DTON

DTON

Wreck 3

Fixes <Radius

251 0

251 0

251 0

251 0

251 0

Local Contacts

230\_019\_1824\_1 15.2

230\_020\_1846\_3 14.9

238\_043\_2045\_1 24.5

238\_044\_2049\_1 12.4

238\_044\_2053\_1 22.3

238\_044\_2056\_1 17.0

238\_050\_2010\_1 7.23

Resolution

SSS Height 1.4  
 Apparent Height 2.21  
 Average Depth 6.5  
 Top Depth 0  
 Length 0  
 Width 0

Significance Criteria

1.4 > 1 m < 20 m or 10 %  
 5.1 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify

Significant

Resolution Criteria

Relief is greater than X% of contact ht

2.21 > 100 % 1.4

Multibeam Coverage

Number of Depths is greater than X

29 > 7

Top Depth is greater than local depth

5.1 > 5.1

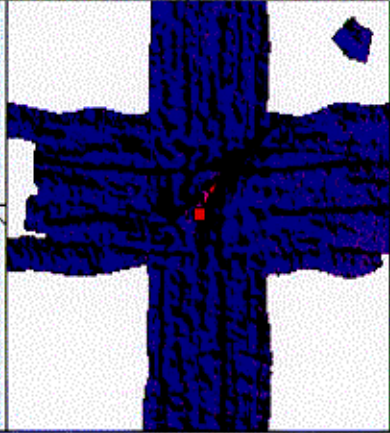
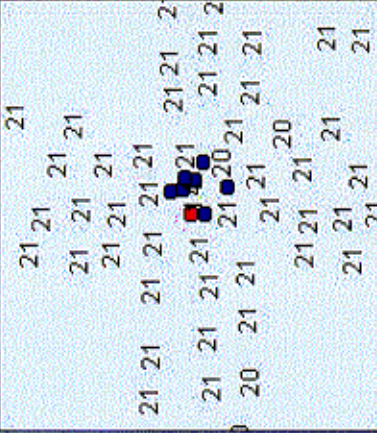
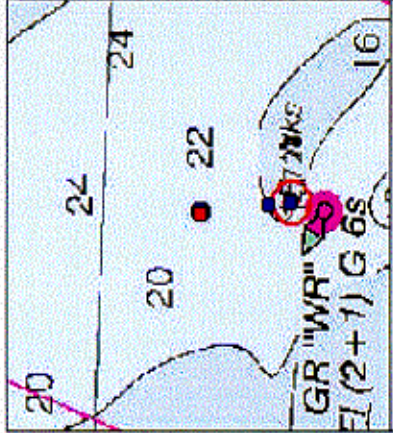
Any green means resolved

Auto-Resolve

Resolved

Resolution Notes

wreck found





**24551.0**  
 Day No. 227  
 Offset 0  
 Shad Len 0  
 Correlating Contact

Correlating Dist 0  
 SSS Height 1.4  
 Second Hit  
 Con Lat 38-50-01.98 N  
 Con Lon 075-06-25.49 W

Development  
 Least Depth 5.01 m AWOIS#  
 Least Depth 16 ft AWOIS Dist 0  
 Day of LD 202 LD Lat 38-50-01.67 N  
 Contact Dist 10.4 LD Lon 075-06-25.66 W  
 LD Source Fe2000\_1\_A\_WHO5\_2000-202\_001\_1404\_7

Comments  
 Contact Remark NFI +DEV Fatho Hit Pile Shape nee  
 Investigation SWMB  
 Charting Rec Chart representative soundings  
 Chart Item

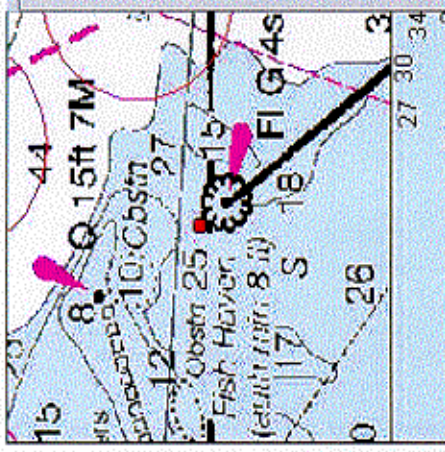
Matching Swath Info  
 Line Day Fix Range

VM

DTON > DTON  
 DTON  
 Sounding 4  
 Fixes <Radius  
 2  
 202 0  
 202 0  
 202 0  
 202 0

Local Contacts

0 meters width 0 meters height



Resolution  
 SSS Height 1.4  
 Apparent Height 3.16  
 Average Depth 8  
 Top Depth 0  
 Length 0  
 Width 0  
 Significance Criteria  
 1.4 > 1 m < 20 m or 10 %  
 6.6 < 25  
 Both Criteria must be red for Auto-Signify  
 Auto-Signify Significant

Resolution Criteria  
 Relief is greater than X% of contact ht  
 3.16 > 100 % 1.4  
 Multibeam Coverage   
 Number of Depths is greater than X  
 49 > 7  
 Top Depth is greater than local depth  
 6.6 > 5.7  
 Any green means resolved  
 Auto-Resolve Resolved

Resolution Notes  
 20 ft sounding identified in H-10917 and submitted as DTON.

272\_124\_0514\_1

Offset -60  
Shad Len 0  
Correlating Contact

272\_223\_1940\_1  
Correlating Dist 3.3

SSS Height 4.1

Second Hit  
Con Lat 38-55-45.08 N  
Con Lon 074-44-53.63 W

Development

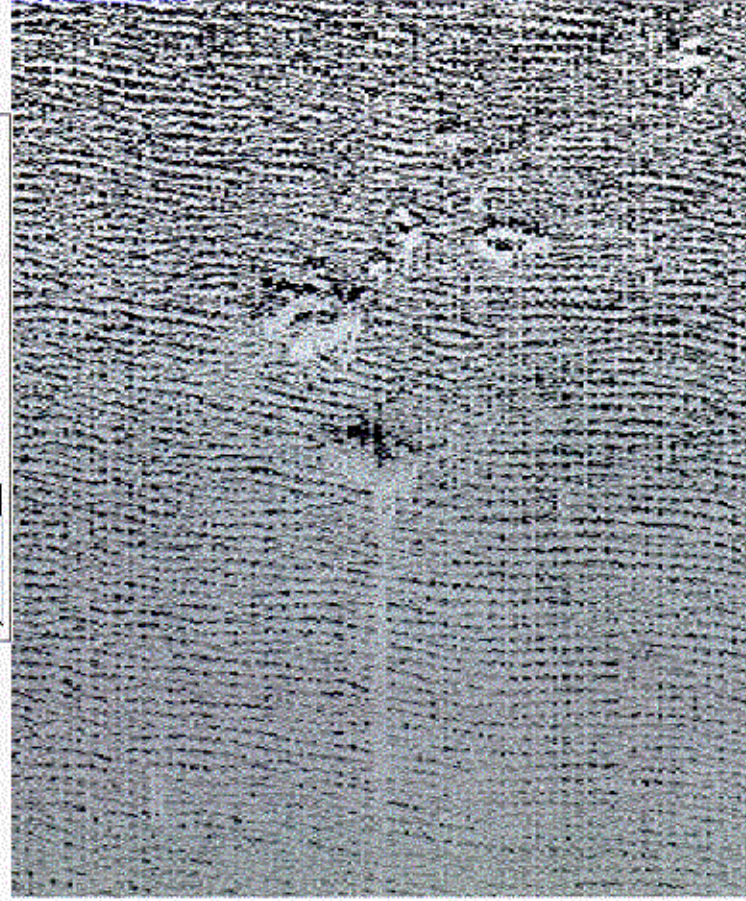
Least Depth 9.3 m AWOIS# 10401  
Least Depth 30 ft AWOIS Dist 912.9  
Day of LD 205 LD Lat 38-55-44.84 N  
Contact Dist 7.8 LD Lon 074-44-53.75 W  
LD Source Fe2000\_19\_Esup\_WHD5\_2000-205\_008\_16

Comments

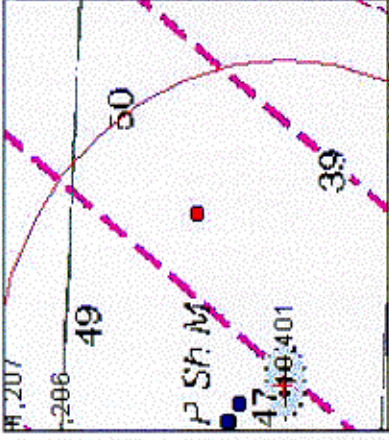
Contact Remark +DEV HYD LONG shadow scatterer  
Investigation SWMB  
Charting Rec Chart "Obstruction, least depth known by sounding only, 30" at the surveyed position."  
 Chart Item  
OBSTN

Matching Swath Info  
Line Day Fix Range

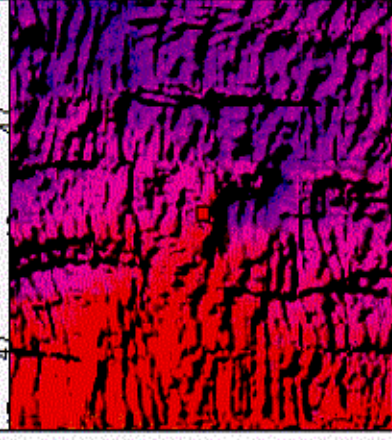
VM



0 meters width 0 meters height



5	46	47	47	47	47	47	47	48	48	4
6	46	47	47	47	47	47	47	48	48	4
45	46	46	47	47	47	47	47	48	48	4
45	46	47	45	47	47	47	47	48	48	4
46	46	47	47	47	47	47	47	48	48	4
6	46	47	47	47	47	47	47	48	48	4
46	47	47	47	47	47	47	47	48	48	4
47	47	47	47	47	47	47	47	48	48	4
46	47	47	47	47	47	47	47	48	48	4



Resolution

SSS Height 4.1  
Apparent Height 5.4  
Average Depth 14.6  
Top Depth 0  
Length 0  
Width 0

Significance Criteria

4.1 > 1 m < 20 m or 10 %  
10.5 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify  Significant

Resolution Criteria

Relief is greater than X% of contact hit

5.4 > 100 % 4.1

Multibeam Coverage

Number of Depths is greater than X

32 > 7

Top Depth is greater than local depth

10.5 > 13.9

Any green means resolved

Auto-Resolve  Resolved

Resolution Notes

DTON DTON

DTON

Obstruction

Fixes < Radius

205 0

205 0

205 0

205 0

Local Contacts

272\_223\_1940\_1 334

274\_211\_2202\_2  
 Offset 3  
 Shad Len 0  
 Correlating Contact  
 275\_110\_0250\_1

Correlating Dist  
 9  
 SSS Height 0  
 Second Hit  
 Con Lat 38-55-39.86 N  
 Con Lon 074-45-33.6 W

**Development**  
 Least Depth 14.6 m AWOIS# 10401  
 Least Depth 48 ft AWOIS Dist 337.3  
 Day of LD 205 LD Lat 38-55-39.94 N  
 Contact Dist 2.3 LD Lon 074-45-33.62 W  
 LD Source Fe2000\_19\_Esup\_WH05\_2000-205\_005\_16

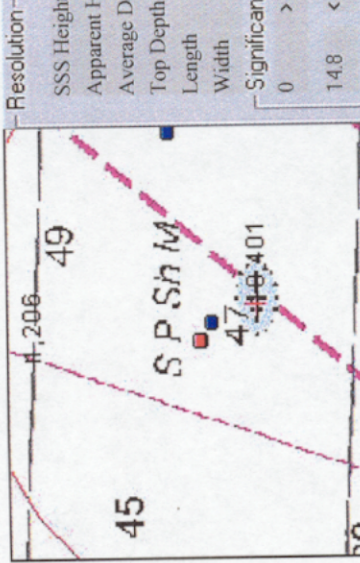
**Comments**  
 Contact Remark For '00 unresvd DEV HYD Possible  
 Investigation SWMB  
 Charting Rec Chart "Wreck, least depth known  
 by sounding only, 48' " at surveyed  
 position.  
 Chart Iter  
 WPK

Matching Swath Info  
 Line Day Fix Range

VM

DTON >DTON  
 DTON  
 Wreck 6  
 Fixes <Radius  
 205 0  
 205 0  
 205 0  
 205 0  
 205 0

Local Contacts  
 275\_110\_0250\_1 8.96



47	47	48	49	48	48	48	49	49	49
47	47	48	48	48	49	49	49	49	49
47	48	47	48	47	48	49	49	49	49
48	47	47	48	48	48	48	48	48	48
47	46	47	47	48	48	48	48	48	48
47	48	48	48	48	47	49	48	48	48
47	47	48	48	48	49	48	49	48	48
47	48	48	48	48	49	49	49	49	49



**Resolution**  
 SSS Height 0  
 Apparent Height 0.3  
 Average Depth 14.8  
 Top Depth 0  
 Length 0  
 Width 0

Significance Criteria  
 0 > 1 m < 20 m or 10 %  
 14.8 < 25

Both Criteria must be red for Auto-Signify  
 Auto-Signify  Significant

**Resolution Criteria**  
 Relief is greater than X% of contact ht  
 0.3 > 100 % 0

Multibeam Coverage   
 Number of Depths is greater than X  
 22 > 7

Top Depth is greater than local depth  
 14.8 > 14.2

Any green means resolved

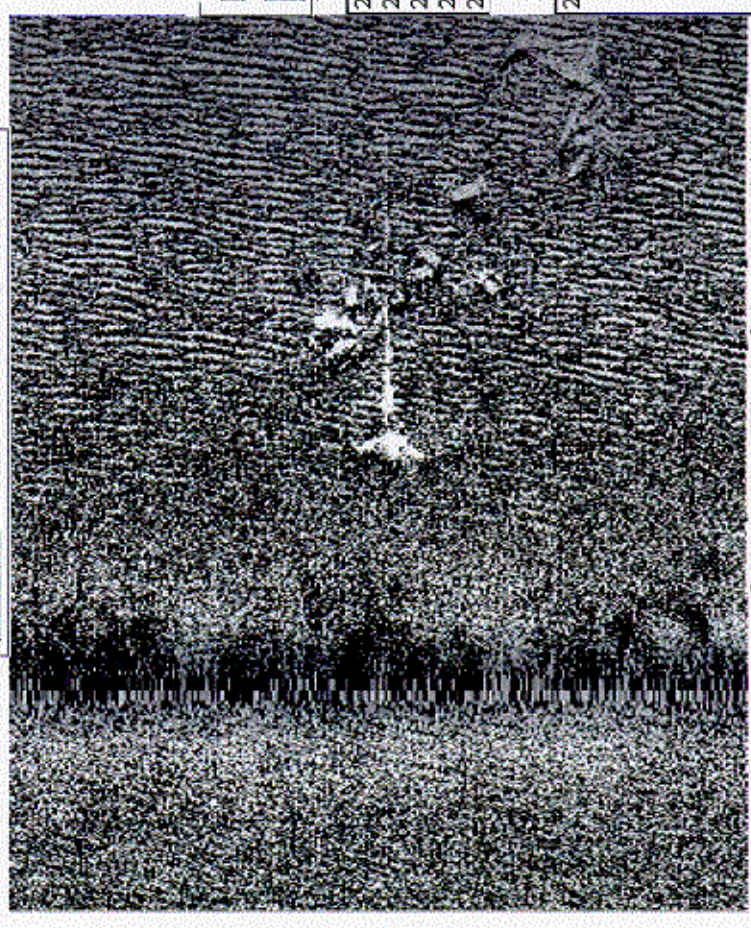
Auto-Resolve  Resolved  
 Resolution Notes

272\_223\_1940\_1  
 Offset 19  
 Shad Len 0  
 Correlating Contact  
 272\_124\_0514\_1  
 Correlating Dist 3.3  
 SSS Height 1.2  
 Second Hit  
 Con Lat 38-55-45.1 N  
 Con Lon 074-44-53.76 W

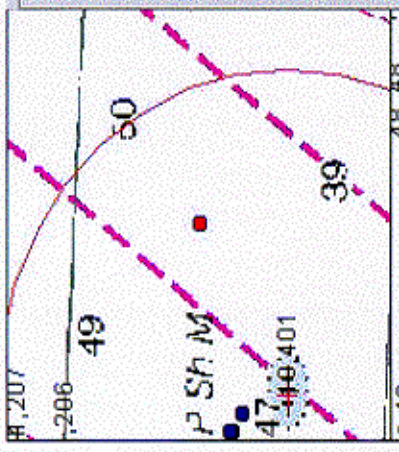
**Development**  
 Least Depth 9.3 m AWOIS# 10401  
 Least Depth 30 ft AWOIS Dist 910.4  
 Day of LD 205 LD Lat 38-55-44.84 N  
 Contact Dist 7.8 LD Lon 074-44-53.75 W  
 LD Source Fe2000\_19\_Esup\_WH05\_2000-205\_008\_16

**Comments**  
 Contact Remark  
 Investigation  
 Charting Rec  
 Chart Item  
 OBSTN  
 +DEV hYD scattered debris LONG  
 SWMB  
 Chart "Obstruction, least depth known by sounding only, 30" at the surveyed position."

**Matching Swath Info**  
 Line Day Fix Range  
 VM



0 meters width 0 meters height



**Resolution**  
 SSS Height 1.2  
 Apparent Height 5.4  
 Average Depth 14.6  
 Top Depth  
 Length 0  
 Width 0  
**Significance Criteria**  
 1.2 > 1 m < 20 m or 10 %  
 13.4 < 25  
 Both Criteria must be red for Auto-Signify  
 Auto-Signify Significant

**Resolution Criteria**  
 Relief is greater than X% of contact ht  
 5.4 > 100 % 1.2  
 Multibeam Coverage   
 Number of Depths is greater than X  
 30 > 7  
 Top Depth is greater than local depth  
 13.4 > 13.9  
 Any green means resolved  
 Auto-Resolve Resolved   
 Resolution Notes

DTON  
 DTON  
 Obstruction 5  
 Fixes <Radius  
 205 0  
 205 0  
 205 0  
 205 0  
 205 0  
 Local Contacts  
 272\_124\_0514\_1 3.34

275\_110\_0250\_1

Offset -23

Shad Len 0

Correlating Contact

274\_211\_2202\_2

Correlating Dist 9

SSS Height 0.8

Second Hit

Com Lat 38-55-39.62 N

Com Lon 074-45-33.4 W

Development

Least Depth 14.6 m AWOIS# 10401  
Least Depth 48 ft AWOIS Dist 328.4  
Day of LD 205 LD Lat 38-55-39.64 N  
Contact Dist 7.7 LD Lon 074-45-33.08 W  
LD Source Fe2000\_19\_Esup\_WH03\_2000-205\_001\_16

Comments

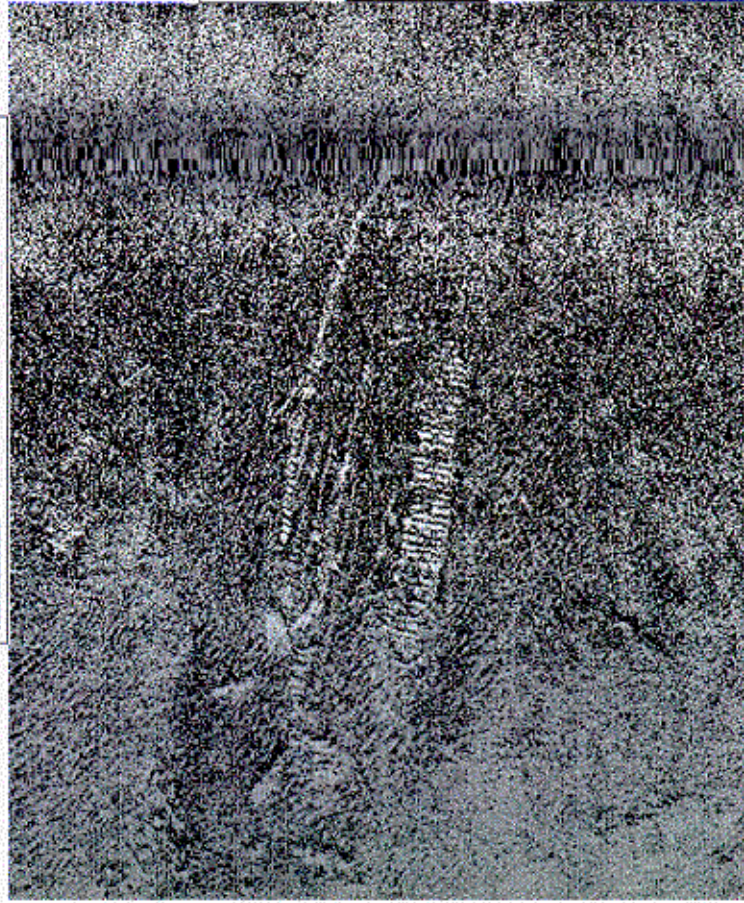
Contact Remark For '00 unresolved HYD DEV possible  
Investigation SWMB

Charting Rec

Chart Item  Wreck, least depth known  
by sounding only, 48' " at surveyed  
position.

Matching Swath Info

Line Day Fix Range



DTON >DTON

DTON

Wreck

Fixes <Radius

- 205 0
- 205 0
- 205 0
- 205 0
- 205 0

Local Contacts

- 274\_211\_2202\_2 8.96
- 274\_211\_2202\_2 8.96

Resolution

SSS Height 0.8  
Apparent Height 0.3  
Average Depth 14.8  
Top Depth 0  
Length 0  
Width 0

Significance Criteria

0.8 > 1 m < 20 m or 10 %  
14 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify  Significant

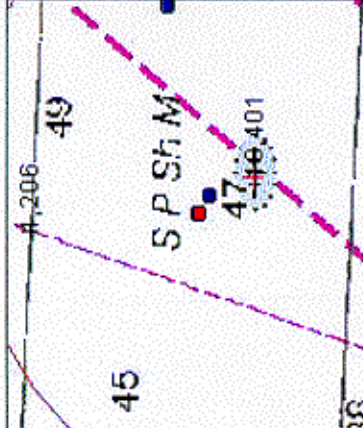
Resolution Criteria

Relief is greater than X% of contact ht  
0.3 > 100 % 0.8  
Multibeam Coverage   
Number of Depths is greater than X  
23 > 7  
Top Depth is greater than local depth  
14 > 14.2  
Any green means resolved

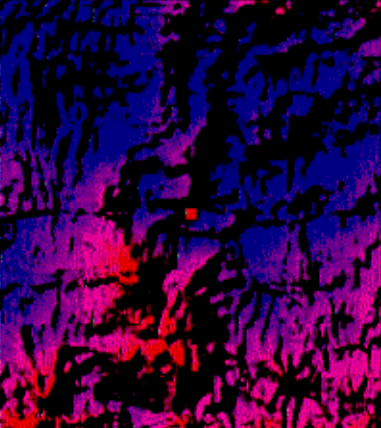
Auto-Resolve  Resolved

Resolution Notes

Delete charted Wreck at awois position.



7	47	48	49	48	48	48	49	49	4
47	48	48	48	49	49	49	4		
47	48	47	48	47	48	49	49	49	4
48	47	47	48	48	48	48	48	48	4
47	46	47	47	48	48	48	48	48	4
47	48	48	48	47	48	48	48	48	4
47	47	48	48	48	48	49	49	48	4
47	48	47	48	48	48	49	49	48	4
7	47	48	47	48	48	48	49	49	4



reference\_point4

Offset 0

Shad Len 0

Correlating Contact

Correlating Dist 0

SSS Height 0

Second Hit

Con Lat 38-46-40.59 N

Con Lon 074-58-38.74 W

Development

Least Depth 15.03 m AWOIS#

Least Depth 49 ft AWOIS Dist 0

Day of LD 252 LD Lat 38-46-40.59 N

Contact Dist 0 LD Lon 074-58-38.74 W

LD Source Fa2000\_25\_WHO5\_2000-232\_026\_1638\_44

Comments

Contact Remark

Investigation

Charting Rec

Chart Item

shoal depth

SWMB

chart representative soundings

Matching Swath Info

Line Day Fix Range

VM

DTON

DTON

Sounding 7

Fixes <Radius

2520

2520

2520

2520

2520

Local Contacts

Resolution

SSS Height 0

Apparent Height 0.77

Average Depth 15.9

Top Depth 0

Length 0

Width 0

Significance Criteria

0 > 1 m < 20 m or 10 %

15.9 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify

Significant

Resolution Criteria

Relief is greater than X% of contact ht.

0.77 > 100 % 0

Multibeam Coverage

Number of Depths is greater than X

13 > 7

Top Depth is greater than local depth

15.9 > 14.9

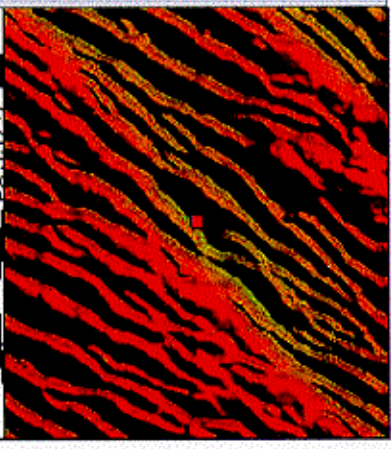
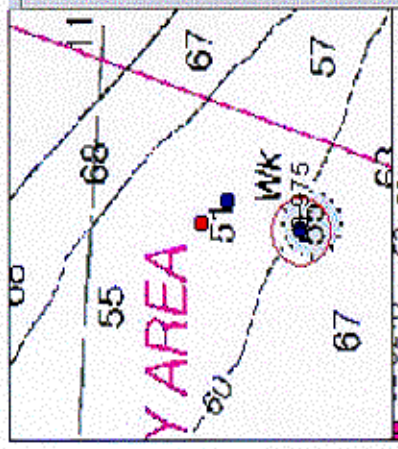
Any green means resolved

Auto-Resolve

Resolved

Resolution Notes

Sounding investigation at request of Pilots Association.



0 meters width 0 meters height

**30' shoal**

Offset 0  
 Shad Len 0  
 Correlating Contact

Correlating Dist 0

SSS Height 15

Second Hit

Con Lat 38-57-46.76 N  
 Con Lon 074-42-56.9 W

**Development**  
 Least Depth 9.2 m AWOIS#  
 Least Depth 30 ft AWOIS Dist 0  
 Day of LD 209 LD Lat 38-57-46.76 N  
 Contact Dist 0 LD Lon 074-42-56.9 W  
 LD Source Fe2000\_19\_Esup\_WHO5\_2000-209\_022\_15

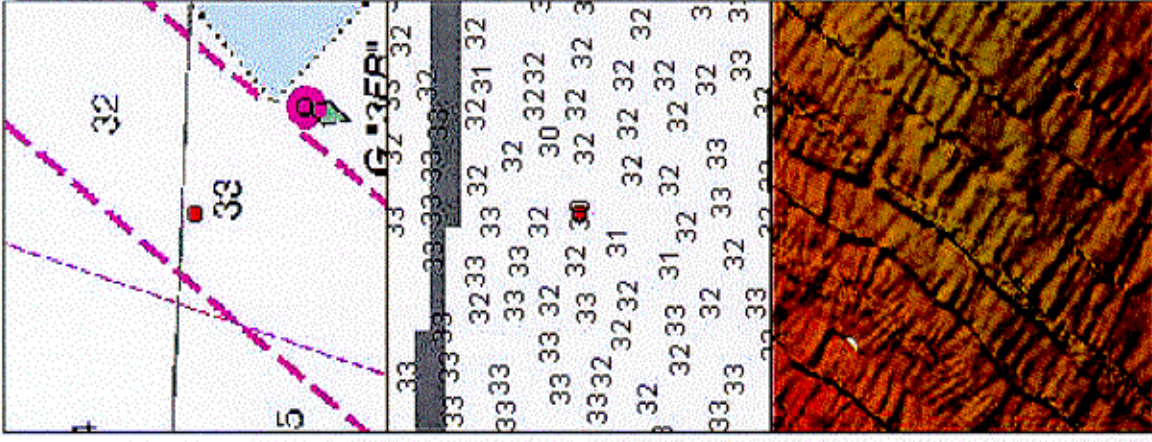
**Comments**

Contact Remark  
 Investigation  
 Charting Rec  
 Chart Item

**Matching Swath Info**

Line Day Fix Range

VM



**Resolution**  
 SSS Height 15  
 Apparent Height 0.8  
 Average Depth 10  
 Top Depth  
 Length 0  
 Width 0

**Significance Criteria**  
 15 > 1 m < 20 m or 10 %  
 -5 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

**Resolution Criteria**  
 Relief is greater than X% of contact ht.  
 0.8 > 100 % 15  
 Multibeam Coverage   
 Number of Depths is greater than X  
 12 > 7  
 Top Depth is greater than local depth  
 -5 > 9.3  
 Any green means resolved

Auto-Resolve Resolved

Resolution Notes

-DTON  
 DTON  
 10, Sounding  
 Fixes < Radius  
 209 0  
 209 0  
 209 0  
 209 0  
 209 0

Local Contacts

0 meters width 0 meters height

**Reference\_point6**

Offset 0  
 Shad Len 0  
 Correlating Contact

**Correlating Dist**

SSS Height 0  
 Second Hit  
 Con Lat 38-56-15.5 N  
 Con Lon 074-51-52.06 W

**Development**

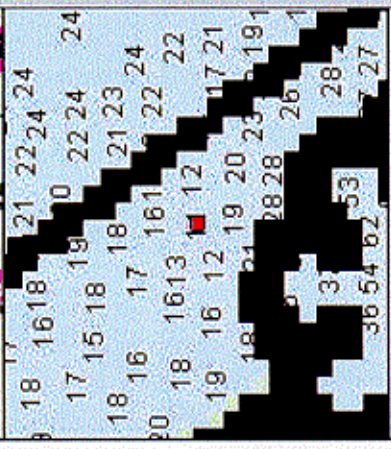
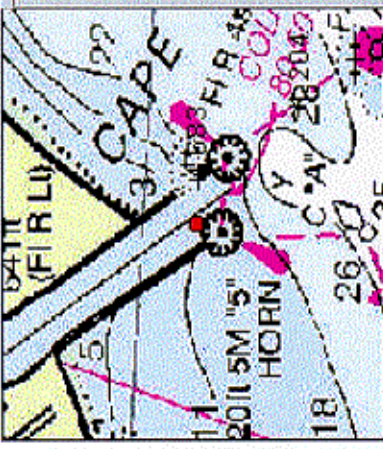
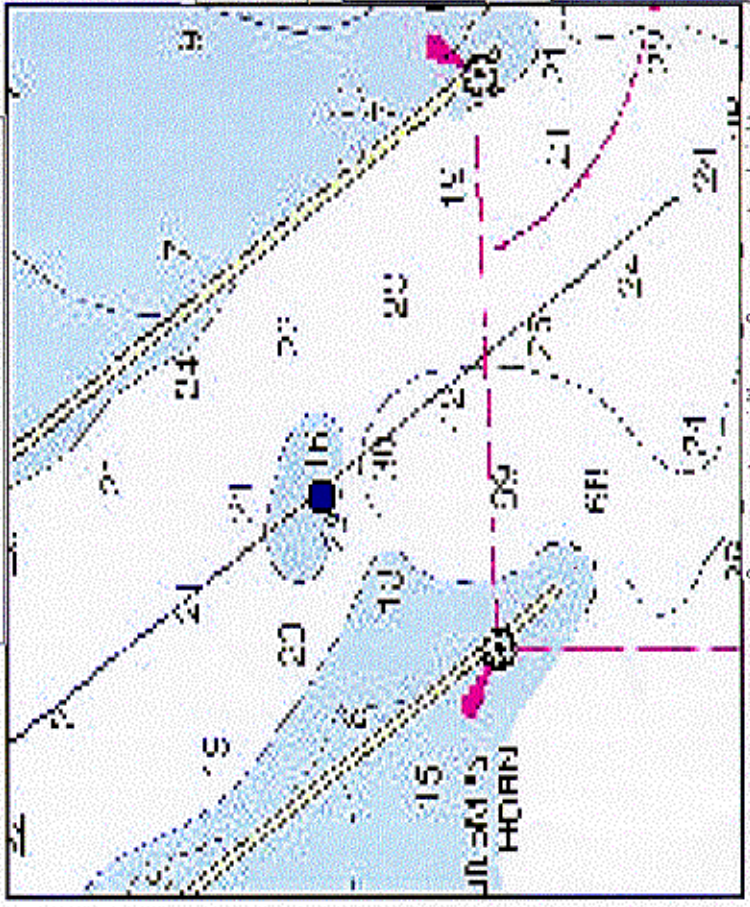
Least Depth 3.37 m AWOIS#  
 Least Depth 11 ft AWOIS Dist 0  
 Day of LD 199 LD Lat 38-56-15.5 N  
 Contact Dist 0 LD Lon 074-51-52.06 W  
 LD Source espemay\_WHO5\_2000-199\_008\_1556\_2388

**Comments**

Contact Remark  
 Investigation  
 Charting Rec  
 Chart Item  
 Chart Item  
 Chart representative soundings

**Matching Swath Info**

Line Day Fix Range



**Resolution**

SSS Height 0  
 Apparent Height 1.31  
 Average Depth 7.4  
 Top Depth 0  
 Length 0  
 Width 0

**Significance Criteria**

0 > 1 m < 20 m or 10 %  
 7.4 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify  Significant

**Resolution Criteria**

Relief is greater than X% of contact ht.

1.31 > 100 % 0

Multibeam Coverage

Number of Depths is greater than X

17 > 7

Top Depth is greater than local depth

7.4 > 3.7

Any green means resolved

Auto-Resolve  Resolved

**Resolution Notes**

CapelMay shoaling



REPORT OF DANGER TO NAVIGATION

Field Examination Survey Registry Number: **F00467**

Survey Title: State: Delaware  
Locality: Approaches to Delaware Bay  
Sub-locality: Delaware Bay and Vicinity

Project Number: **OPR-D392-WH**

Survey Date(s): August 10 and September 8, 2000

Soundings are reduced to Mean Lower Low Water (MLLW) using Preliminary Observed Water Levels. Horizontal datum is NAD 83.

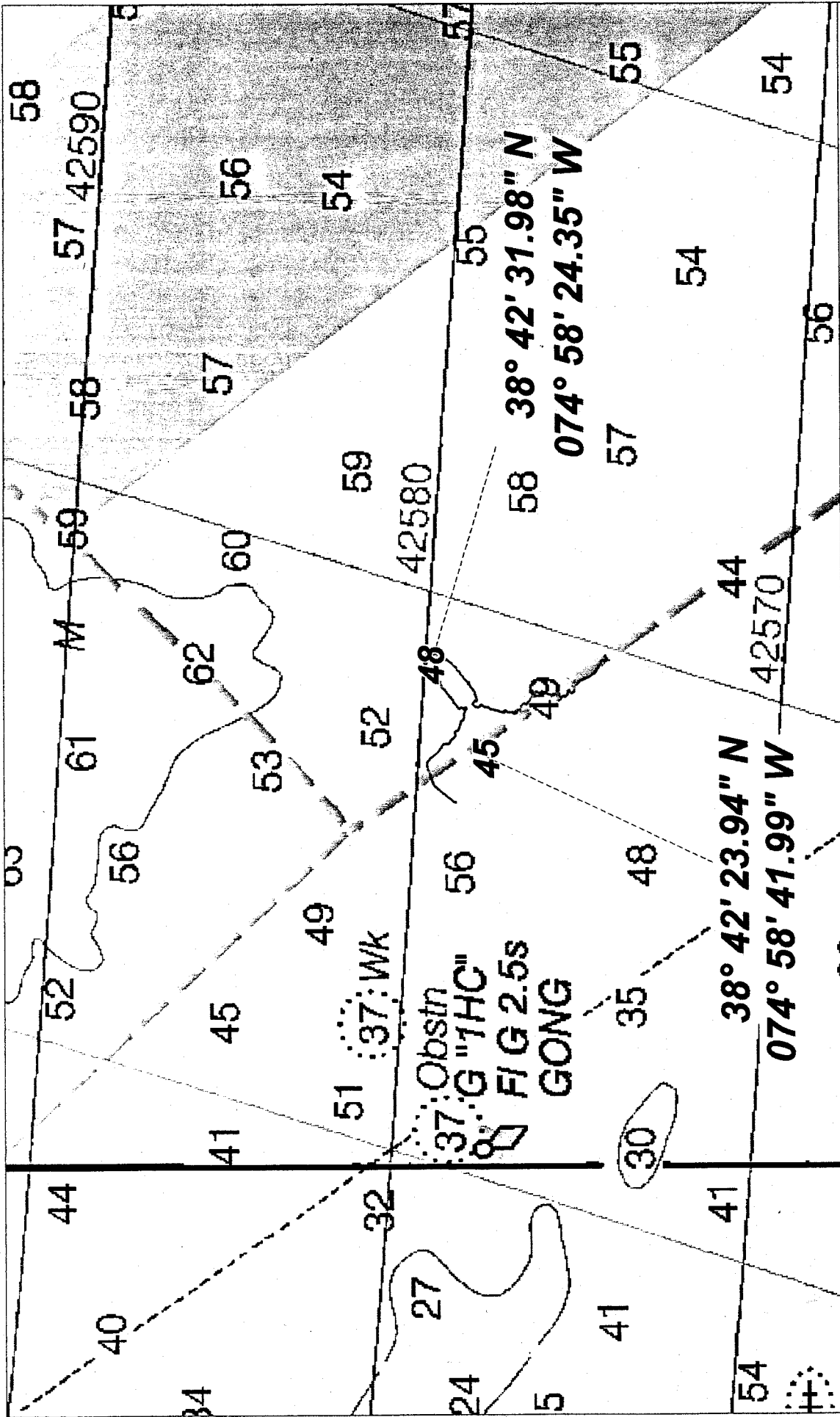
Chart(s) Affected: **12214 42<sup>nd</sup> Edition/September 25, 1999, 1:80,000, NAD 83**

DANGER TO NAVIGATION

<u>Feature</u>	<u>Depth (ft)</u>	<u>Latitude</u>	<u>Longitude</u>
Shoal	48	38° 42' 31.98" N	074° 58' 24.35" W
Shoal	45	38° 42' 23.94" N	074° 58' 41.99" W

These two points describe an area of shoaling located in the outbound side of the Cape Henlopen to Delaware Bay traffic lane. The shoal extends from the first position southwestward to the second position immediately outside of the traffic lane. Outbound deep-draft vessels are urged to navigate using the left, or eastern half, of the Cape Henlopen to Delaware Bay traffic lane in this area.

Questions concerning this report should be directed to the Chief, Atlantic Hydrographic Branch at 757-441-6746.



This chartlet may not be up to date with the latest Local Notice to Mariners information.  
DO NOT paste onto NOAA nautical charts.

Chart 12214, 42nd Edition, September 25, 1999, Scale 1:80,000, Cape May to Fenwick Island  
Revisions from NOAA Hydrographic Survey F00467  
50-ft depth curve highlighted in red.

Project: OPR-D392-WH  
Survey: F00467  
State: Delaware  
Locality: Approaches to Delaware Bay  
Sub-locality: Delaware Bay & Vicinity  
Survey Scale: 1:10,000

**NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION**  
**NATIONAL OCEAN SERVICE**

Sounding Units: Meters  
Sounding Datum: MLLW  
Horizontal Datum: NAD 83  
Projection: UTM 18  
Central Meridian: 075° 00' 00"  
Scale Factor: 0.9996

**NOAA Ship WHITING**  
**LCDR Gerd F. Giang**  
**Commanding**  
August 10, 2000 & September 8, 2000





**UNITED STATES 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

August 19, 1999

Captain Jonathan Vaughn  
Director Of Operations  
Pilots Association for the  
Bay and River Delaware  
41 Cape Henlopen Drive  
Lewes, Delaware 19958

Dear Captain Vaughn:

Attached is a preliminary plot of our hydrographic item investigation on the 30-foot sounding charted southeast of Fourteen Foot Bank (and labeled "Rk"). We conducted a 500-meter radius side scan search for the charted item and observed at least one contact in our data. The contact's position is shown on the attached chartlet in position latitude 39°-02'-26.26"N, longitude 075°-09'-59.34"W.

The object appears to be approximately 2.6 feet in height off the bottom (based on the side scan data). We will continue processing this contact further to determine an accurate least depth at preliminary chart datum, confirm the object's location, and reassess the charted depths shown in the immediate area.

Please pass a copy of this to Captain Potter, or any pilot who might need this information. As always, feel free to call me at 757-647-0187 if you have any questions.

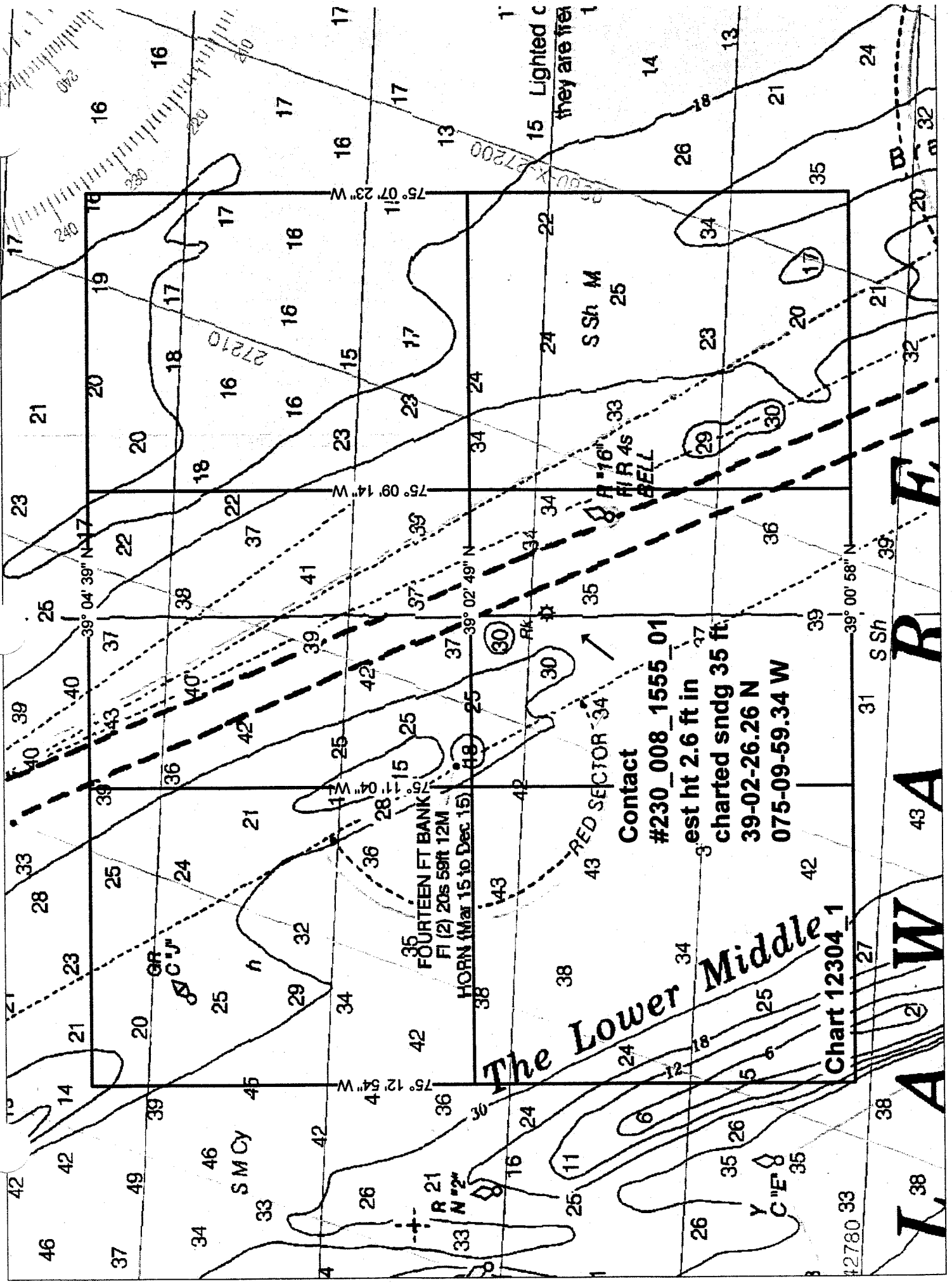
Sincerely,

Gerd F. Glang, LCDR, NOAA  
Commanding Officer

Attachment

cc: DeBow, N/CS3  
WH-FOO





**Contact**  
**#230\_008\_1555\_01**  
 est ht 2.6 ft in  
 charted sndg 35 ft.  
 39-02-26.26 N  
 075-09-59.34 W

**The Lower Middle**  
**Chart 12304\_1**

35  
 FOURTEEN FT BANK  
 FI (2) 20s 59ft 12M  
 HORN (Mar 15 to Dec 15)

43  
 RED SECTOR

R 16"  
 R R 4s  
 BELL

S Sh M

15 Lighted c  
 they are fire

2780 33

T A W A R E



**UNITED STATES DEPARTMENT OF COMMERCE**

National Oceanic and Atmospheric Administration  
Office of Marine and Aviation Operations  
NOAA Ship WHITING S-329  
439 W. York Street  
Norfolk, VA 23510-1114  
September 14, 2000

Captain Jonathan Vaughn  
Director Of Operations  
Pilots Association for the  
Bay and River Delaware  
41 Cape Henlopen Drive  
Lewes, Delaware 19958

Dear Captain Vaughn:

Enclosed is a preliminary copy of a Danger To Navigation Report concerning the grounding site of the T/V Michael.

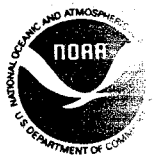
If you have any questions concerning this item, please feel free to call me directly at 757-647-0187 aboard WHITING. We also completed the item investigations discussed at your September 7<sup>th</sup> Maritime Advisory Committee meeting. Results from these investigations are forthcoming.

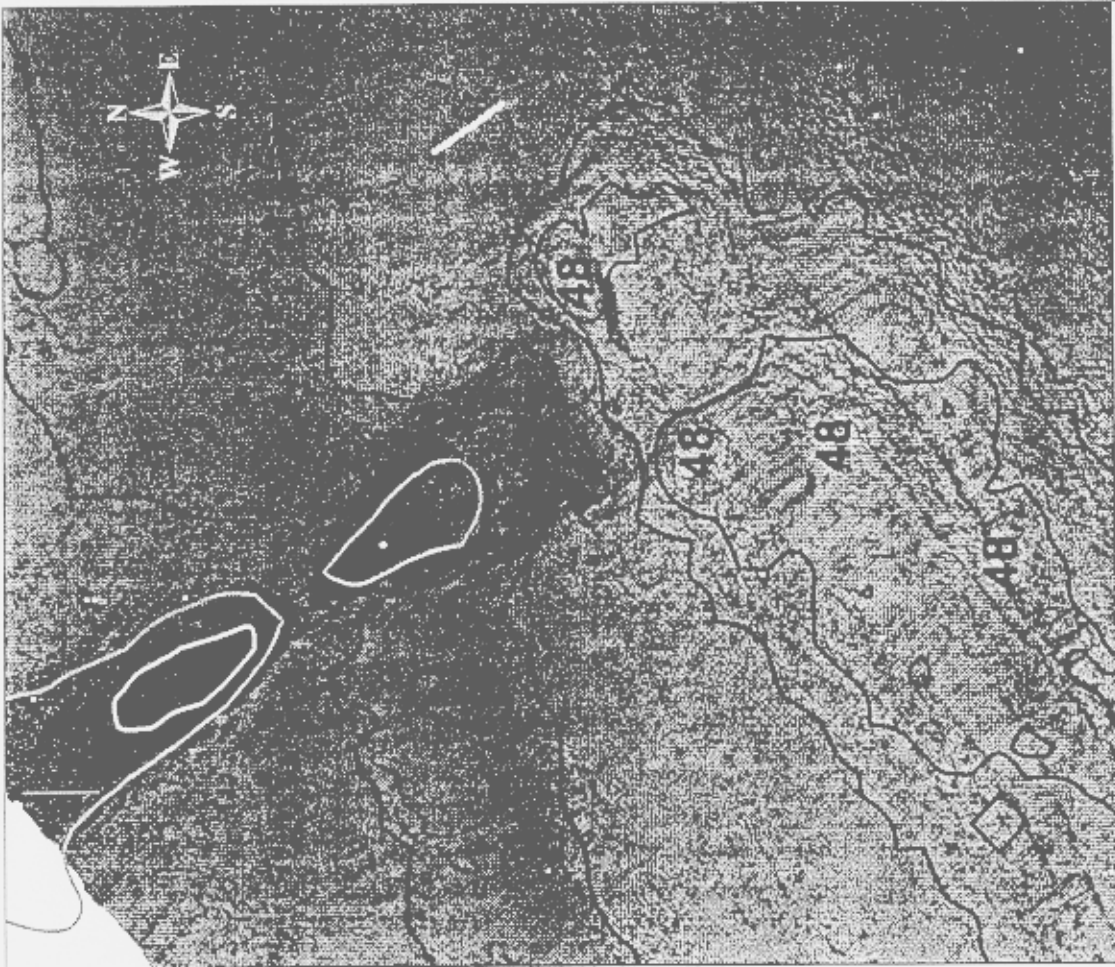
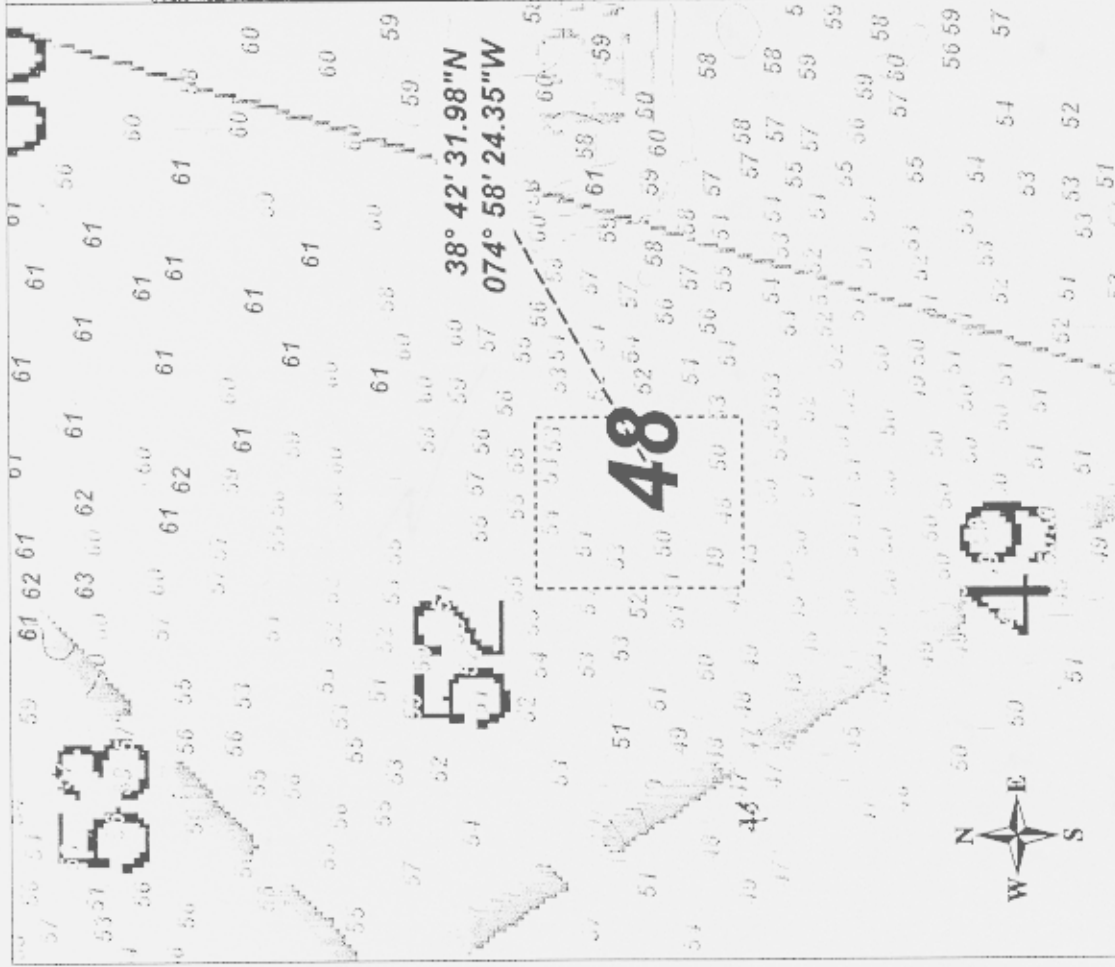
Sincerely,

A handwritten signature in cursive script that reads "Gerd F. Glang".

Gerd F. Glang  
Lieutenant Commander, NOAA  
Commanding Officer

Enclosures





Field Examination: TV MICHAEL grounding site.

Left Panel: NOAA Chart 12214, 42nd Edition, September 25, 1999; 1:80,000  
 Survey soundings shown in feet on MLLW using Preliminary Observed Water Levels.

Right Panel: Detail of sun-illuminated digital terrain model (DTM) from high-resolution bathymetry.



NATIONAL OCEANIC AND  
 ATMOSPHERIC ADMINISTRATION  
 NATIONAL OCEAN SERVICE

Project: OPR-D392-WH  
 Survey: F00467  
 State: Delaware  
 Locality: Approaches to Delaware Bay  
 Sub-locality: Delaware Bay & Vicinity  
 Survey Scale: 1:10,000

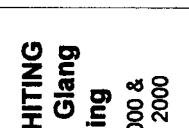
Sounding Units: Meters  
 Sounding Datum: MLLW  
 Horizontal Datum: NAD 83  
 Projection: UTM 18  
 Central Meridian: 075° 00' 00"  
 Scale Factor: 0.9996

NOAA Ship WHITING  
 LCDR Gerd F. Glang  
 Commanding  
 August 10, 2000 &  
 September 8, 2000



Field Examination: T/V MICHAEL grounding site.

Left Panel: Survey H-10476, 1993, NOAA Ship WHITING  
 Right Panel: Detail of prior survey H-10476 with sounding data from high-resolution bathymetry.

	<p><b>NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION</b>  <b>NATIONAL OCEAN SERVICE</b></p>	<p>Project: OPR-D392-WH        Survey: F00467        State: Delaware        Locality: Approaches to Delaware Bay        Sub-locality: Delaware Bay &amp; Vicinity        Survey Scale: 1:10,000</p>	<p>Sounding Units: Meters        Sounding Datum: MLLW        Horizontal Datum: NAD 83        Projection: UTM 18        Central Meridian: 075° 00' 00"        Scale Factor: 0.9996</p>	<p><b>NOAA Ship WHITING</b>  <b>LCDR Gerd F. Glang</b>        Commanding        August 10, 2000 &amp;        September 8, 2000</p>
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DN 258

1014

NOAA Ship WHITING  
Dive Investigation Report  
Dive No. 258.1

Survey Information

AWOIS Item: 8132	Description: Wreck of Sarah Lawrence	Date: September 14, 2000
Latitude - Longitude		SSS Contacts
38° 44' 56.82" N	075° 03' 57.45" W	204 122 1518 1
SWMB day/line/time/ping/beam		VBES Positions
SWMB Depth		VBES Depth

Dive Information

Dive Master: Anton Clemens	Time In: 1017
Dive Tender: Jeremy Weirich	Time Out: 1034
Diver #1: Anton Clemens	Max Depth:
Diver #2: Rick Brennan	Visibility/Current:

Diver's Least Depth Gauge Information

Gauge Number:	68332	CTD Location:	
Pre-Dive Deck Pressure:	14.865	CTD Time:	
Least Depth Pressure:	—	DLDG Depth:	
Post-Dive Deck Pressure:	14.82	Tide Corrector:	
Time of Least Depth:	—	Item Least Depth:	

Narrative Report:

NOTHING FOUND



NOAA Ship WHITING  
Dive Investigation Report  
Dive No. 258.2

Survey Information		
AWOIS Item: 8132	Description: Wreck of Sarah Lawrence	Date: September 14, 2000
Latitude - Longitude		SSS Contacts
38° 45' 24.67" N	075° 03' 24.60" W	204 115 1549 1
SWMB day/line/time/ping/beam		VBES Positions
SWMB Depth		VBES Depth

Dive Information		
Dive Master: Anton Clemens	Time In: 1123	<i>2ND DIVE</i>
Dive Tender: Jeremy Weirich	Time Out: 1133	<i>IN = 1347</i>
Diver #1: Anton Clemens	Max Depth:	<i>OUT = 1402</i>
Diver #2: Rick Brennan	Visibility/Current:	

Diver's Least Depth Gauge Information			
Gauge Number:	68332	CTD Location:	
Pre-Dive Deck Pressure:	14.82	CTD Time:	
Least Depth Pressure:	—	DLDG Depth:	
Post-Dive Deck Pressure:	—	Tide Corrector:	
Time of Least Depth:	—	Item Least Depth:	

Narrative Report:

NOTHING FOUND

NOAA Form 77-6  
(Rev. 8/95)U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

## COAST PILOT REPORT

**SUBMIT TO:**NATIONAL OCEAN SERVICE, NOAA (N/CS261)  
1315 EAST-WEST HIGHWAY, STATION 7317  
SILVER SPRING, MD 20910-3282  
FAX: 301-713-4516  
INTERNET: [Lynn.Preston@noaa.gov](mailto:Lynn.Preston@noaa.gov)

This record of your experience and observations when traversing the coast, entering port, and/or navigating inside waters will be used to update the Coast Pilot.

**OBSERVER: NAME AND ADDRESS**Commanding Officer  
NOAA Ship WHITING  
439 West York Street  
Norfolk, VA 23510

TEL. (daytime) (757) 441-6322

**DATE OF OBSERVATION** August 15 - October

17, 1999 July 20 - September 12, 2000

**DATE OF SUBMISSION** March 23, 2001**VESSEL NAME AND ADDRESS**NOAA Ship WHITING  
439 West York Street  
Norfolk, VA 23510**GEOGRAPHIC LOCATION***(Refer to charted objects by distance and bearing and/or include latitude/longitude, as applicable)*

Delaware

Atlantic Ocean

Delaware Bay 9.5 nm NNW Cape Henlopen Point

(See attached chartlet for specific survey areas)

**CHART NUMBER**

12214, 12304, 13003, 12317, 12216, 12200

**COAST PILOT NUMBER and EDITION NUMBER**Number 3, 34<sup>TH</sup> edition**CHANGES TO EXISTING COAST PILOT TEXT**

Give recommended revised language for the book. Identify affected text by page, paragraph(s), and line number(s). State the source of the information if other than personal; observation.

**Chapter 4, paragraph 71.** The hydrographer recommends the following remarks:

Page 129: Change "In April-May 1999, the controlling depth was 16 feet in the channel through Cape May Inlet to the inner ends of the jetties, ..." to "Shoaling up to 11 feet in the Cape May Inlet entrance has been reported by WHITING July, 2000."

**Chapter 6, paragraph 97.** The hydrographer recommends the following remarks:

Page 145: Change "Depths in the traffic lane are 51 feet or more." to "Shoaling of up to 48 feet has been reported by NOAA Ship WHITING August-September 2000 in the Cape Henlopen to Delaware outbound traffic lane, 8.4 nm bearing 139° T from the Harbor of Refuge Light."

(Continue on plain paper)

## REQUEST FOR SURVEYS OR CHART CHANGE

List area for which surveys and/or changes in chart format, scale, or layout are needed. Include the name and geographic position of the area, the chart number of the largest scale chart that covers the area, and the reason for the request.

Since this information was gathered during a prescribed NOAA hydrographic survey, no survey recommendations or charts revisions are recommended here. Refer to WHITING OPR-D392-WH Descriptive Reports H-10926 Delaware, Atlantic Ocean, 9.5 nm NNW Cape Henlopen Point. (1999-2000) and F-00467 Delaware-New Jersey, Delaware Bay and Approaches (2000).

(Continue on plain paper)

## ADDITIONAL INFORMATION FOR THE COAST PILOT

We are particularly interested in information about unusually strong currents; prominent landmarks; objects which provide particularly good radar return; sheltered anchorages (be explicit on direction of weather and type of bottom observed); drawbridge operation changes (e.g., drawbridge remains permanently in open position); change in pilot pick-up points; changes in radio frequencies monitored by pilots, marine exchanges, harbor masters, or drawbridges.

The hydrographer does not recommend any further information.

(Continue on plain paper)

Public reporting burden for this collection is estimated to average thirty minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the National Ocean Service (N/CS261), 1315 East-West Highway, Silver Spring, MD 20910-3282; and to the Office of Management and Budget, Paperwork Reduction Project (0648-0007), Washington, DC 20503.

**CHANGES TO COAST PILOT TEXT (CONTINUED)**

The following differences were noted while transiting the C&D Canal:

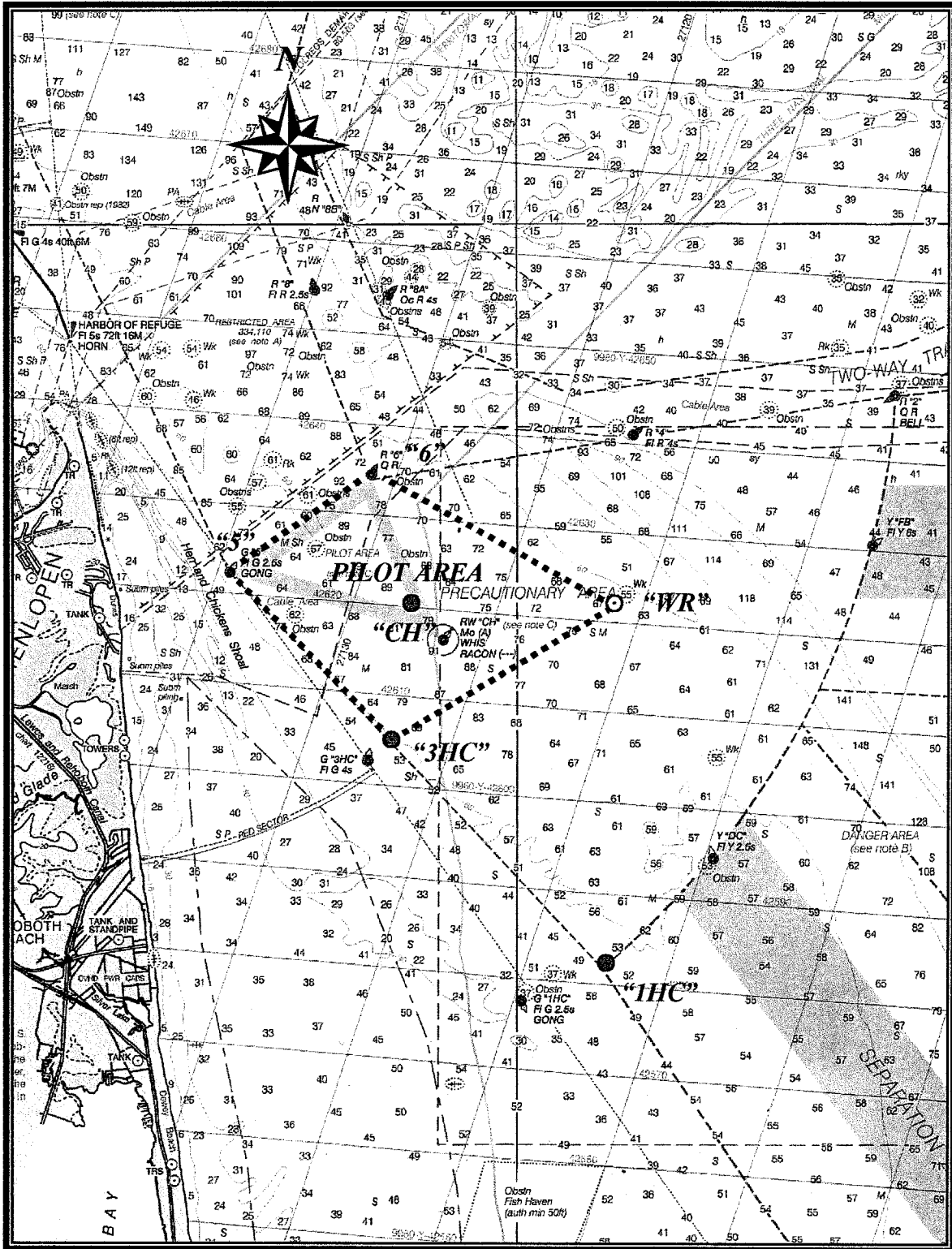
**Chapter 7 paragraph 23** Page 164: Change “ Drawbridges. Operation of the Penn Central vertical lift bridge across the canal will be in accordance with regulations promulgated by the U.S. Coast Guard.” to “Drawbridges. Operation of the Norfolk Southern Railroad vertical lift bridge across the canal will be in accordance with regulations promulgated by the U.S. Coast Guard.”

**Chapter 7 paragraph 73** Page 165: Change “The ConRail Bridge across the canal at Canal Station, Mile 7.5, has a vertical-lift span with a clearance of 45 feet down and 138 feet up.” to “ The canal rail bridge across the canal at Canal Station, Mile 7.5, has a vertical-lift span with a clearance of 45 feet down and 138 feet up.”

NOTE: The Norfolk Southern Railroad bridge, locally referred to as the canal rail bridge, is the subject of both paragraphs.

# PROPOSED CHANGES TO BUOYS AND PILOT AREA September 7, 2000

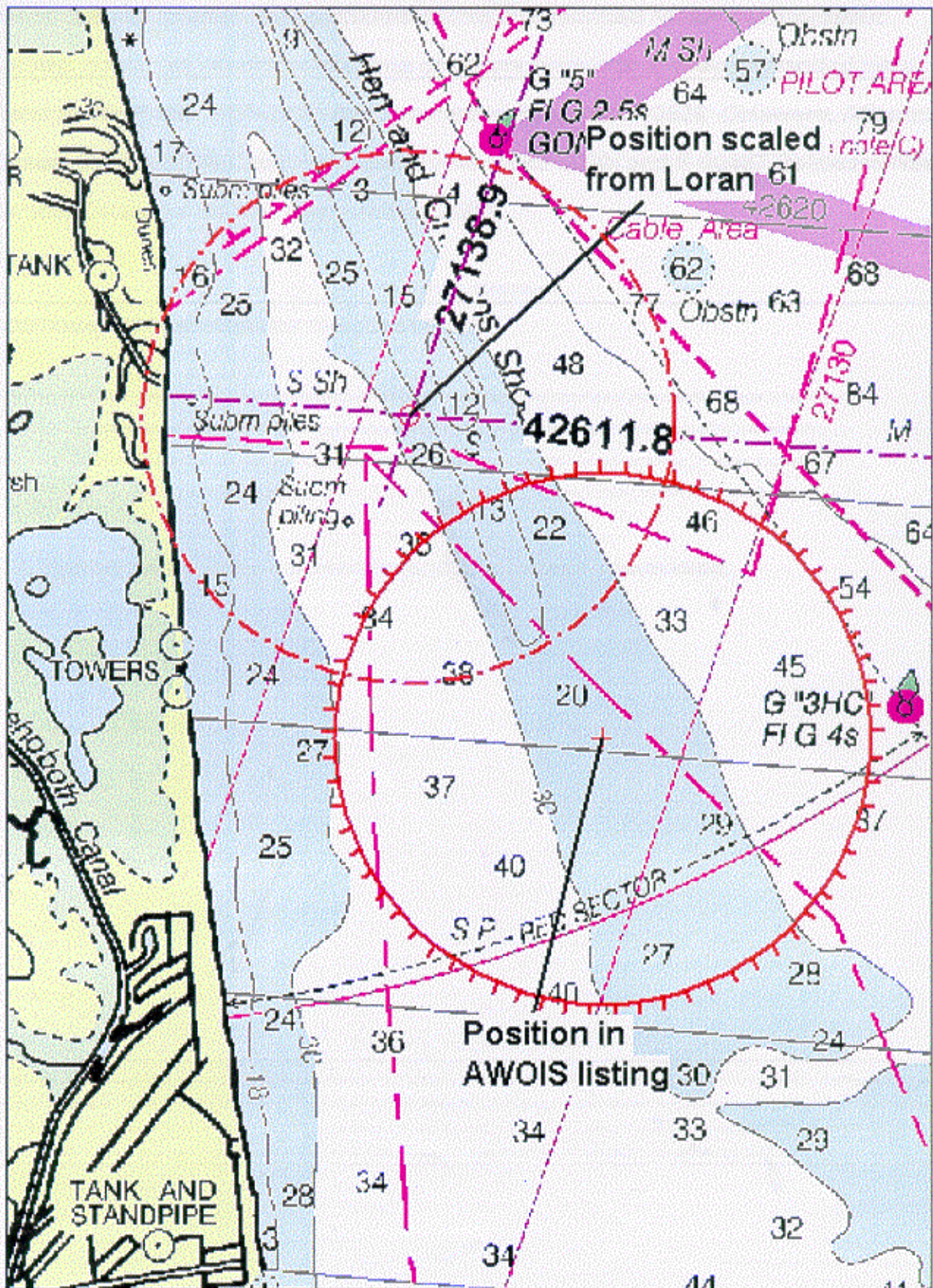
Please Note: Positions of buoys are approximate  
○ Indicates new buoy ● Indicates moved buoy



"1HC" 38° 42.73N; 074° 58.95W  
"CH" 38° 46.27N; 075° 01.30W

"3HC" 38° 44.65N; 075° 01.25W  
"WR" 38° 46.27N; 074° 58.63W

CHARTLET SHOWING DIFFERENCE BETWEEN REPORTED AND AWOIS POSITION



**APPENDIX K**  
**APPROVAL SHEET**

OPR-D392-WH  
Delaware Bay and Approaches  
New Jersey - Delaware

Delaware Bay and Approaches  
**Survey Registry No. F00467**

Hydrographic survey operations for these field examinations were conducted under my daily supervision with frequent checks of progress and adequacy. All field sheets, this Descriptive Report, and all accompanying records and data are approved.

This survey is adequate to supersede all prior surveys in common areas, and for application to the relevant NOS nautical charts.

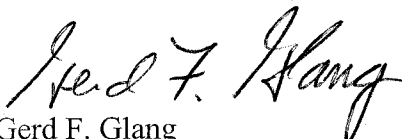
Respectfully Submitted,



Richard T. Brennan  
Lieutenant, NOAA  
Field Operations Officer  
NOAA Ship WHITING

July 5, 2001  
Date

Approved:



Gerd F. Glang  
Lieutenant Commander, NOAA  
Commanding Officer  
NOAA Ship WHITING

JULY 5, 2001  
Date

**LETTER TRANSMITTING DATA**

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

- ORDINARY MAIL                       AIR MAIL  
 REGISTERED MAIL                       EXPRESS  
 GBL (Give number) \_\_\_\_\_

DATE FORWARDED

02/11/2002

NUMBER OF PACKAGES

1

**TO:**

• NOAA / National Ocean Service  
 Chief, Data Control Group, N/CS 3x1  
 SSMC3, Station 6815  
 1315 East-West Hwy.  
 Silver Spring, MD 20910-3282

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

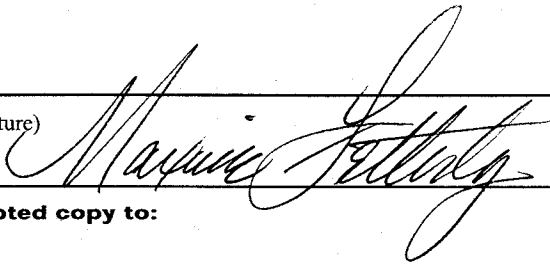
F00467

New Jersey - Delaware  
Delaware Bay

- 1 Descriptive Report / Evaluation Report
- 12 Mylar - final AHB Smooth Sheets (attached to Evaluation Report)
- 4 Mylar - H-Drawings for NOS charts 12214, 12216, 12304, 12317

ATTN: George Myers 301-713-2709

**FROM:** (Signature)



**RECEIVED THE ABOVE**  
(Name, Division, Date)

**Return receipted copy to:**

• Maxine Fetterly  
 Atlantic Hydrographic Branch  
 439 W. York St.  
 Norfolk, VA 23510



GEOGRAPHIC NAMES

F00467

Name on Survey	A ON CHART NO. 12304-12214 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									
	CAPE HENLOPEN	X		X						
CAPE MAY HARBOR	X		X							2
CAPE MAY INLET	X		X							3
DELAWARE (title)	X		X							4
DELAWARE BAY	X		X							5
HEN AND CHICKENS										6
SHOAL	X		X							7
NEW JERSEY (title)	X		X							8
NORTH ATLANTIC										9
OCEAN	X		X							10
SEWELL POINT	X		X							11
TWO MILE BEACH	X		X							12
										13
										14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25

Approved: *Curtis Clay*

Chief Geographer

AUG 16 2001



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SERVICE  
Silver Spring, Maryland 20910

**TIDE NOTE FOR HYDROGRAPHIC SURVEY**

**DATE:** November 14, 2000

**HYDROGRAPHIC BRANCH:** Atlantic  
**HYDROGRAPHIC PROJECT:** OPR-D392-WH-2000  
**HYDROGRAPHIC SHEET:** F00467

**LOCALITY:** Approaches to Delaware Bay and Vicinity, DE  
**TIME PERIOD:** July 17 - September 12, 2000

**TIDE STATION USED:** 855-7380 Lewes, DE  
Lat. 38° 46.9'N Lon. 75° 7.2'W  
**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters  
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 1.314 meters

**TIDE STATION USED:** 855-4399 Mahon River Entrance, DE  
Lat. 39° 11.1'N Lon. 75° 24.0'W  
**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters  
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 1.746 meters

**REMARKS: RECOMMENDED ZONING**  
Use zone(s) identified as: DB4, DB5, DB14, DB15, DB39,  
ATL526, ATL527, ATL528, ATL530, ATL531, ATL532,  
ATL535, ATL536, ATL540, ATL542 & ATL549.

Refer to attachments for zoning information.

**Note 1:** Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time.

*Thomas W. Mura* 11/15/00  
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**CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION**



**ATLANTIC HYDROGRAPHIC BRANCH  
EVALUATION REPORT FOR F00467 (2000)**

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

**D. AUTOMATED DATA ACQUISITION AND PROCESSING**

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

Hydrographic Processing System  
NADCON, version 2.10  
MicroStation 95, version 5.05  
I/RAS B, version 5.01

The smooth sheet was plotted using a Hewlett Packard DesignJet 2500CP plotter.

**H. CONTROL STATIONS**

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. Twelve page size sheets have been annotated with ticks showing the computed mean shift between NAD 83 and the North American Datum of 1927 (NAD 27).

(1) To place sheets 1, 8, and 9 of 12 on NAD 27, move the projection lines 0.407 seconds (12.537 meters or 1.25 mm at the scale of the survey) north in latitude, and 1.341 seconds (32.272 meters or 3.23 mm at the scale of the survey) east in longitude.

(2) To place sheet 2 of 12 (1:20,000) on NAD 27, move the projection lines 0.404 seconds (12.449 meters or 0.62 mm at the scale of the survey) north in latitude, and 1.361 seconds (32.859 meters or 1.64 mm at the scale of the survey) east in longitude.

(3) To place sheets 3 and 7 of 12 on NAD 27, move the projection lines 0.406 seconds (12.516 meters or 1.25 mm at the scale of the survey) north in latitude, and 1.389 seconds (33.662 meters or 3.37 mm at the scale of the survey) east in longitude.

(4) To place sheets 4, 5, and 12 of 12 on NAD 27, move the projection lines 0.407 seconds (12.555 meters or 1.26 mm at

the scale of the survey) north in latitude, and 1.403 seconds (33.777 meters or 3.38 mm at the scale of the survey) east in longitude.

(5) To place sheets 6,10, and 11 of 12 on NAD 27, move the projection lines 0.404 seconds (12.449 meters or 1.24 mm at the scale of the survey) north in latitude, and 1.361 seconds (32.859 meters or 3.29 mm at the scale of the survey) east in longitude.

**I. SHORELINE**

Brown shoreline originates with National Ocean Service (NOS) charts 12214 (43<sup>rd</sup> Ed., Dec. 16/00) and 12317 (30<sup>th</sup> Ed., February 3/96) and is for orientation purposes only.

**K. JUNCTIONS**

H10917 (1999)  
H10931 (1999)

The present survey F00467, sheet 1 of 12, falls within the survey limits of junction survey H10917 (1999). This area is in good agreement with H10917 (1999).

The present survey F00467, sheet 7 of 12, falls within the survey limits of junction survey H10931 (1999). This area is in good agreement with H10917 (1999).

Present survey depths are in harmony with the charted hydrography.

**L. COMPARISON WITH PRIOR SURVEYS**

A comparison with prior surveys was not done during office processing in accordance with section 4. of the memorandum titled "Changes to Hydrographic Survey Processing", dated May 24, 1995.

**M. ITEM INVESTIGATIONS**

Automated Wreck and Obstruction Information System (AWOIS) Item #8132, an uncharted wreck, originates with Chart Letter 208 of 1985 (CL208/85). The position for this AWOIS item is incorrectly stated in the chart letter, AWOIS history and in the book "Notebook on Shipwrecks, Maryland-Delaware

Coast". An investigation by the hydrographer was conducted in the wrong location. Subsequent information provided an approximate position of the wreck in Latitude 38°45'43"N, Longitude 75°03'54"W. This information was obtained via telephone conversation with Steve Verry, Hydrographic Survey Division, and was confirmed by Captain David Potter, Pilots Association for Bay and River, Delaware. It is recommended that a dangerous sunken wreck PA, be charted in the position shown above. Additional work is recommended on this feature.

N. COMPARISON WITH CHART 12317 (30<sup>th</sup> Edition, Feb 3/96)  
12216 (26<sup>th</sup> Edition, May 12/01)  
12214 (43<sup>rd</sup> Edition, Dec 16/00)  
12304 (41<sup>st</sup> Edition, Apr 22/00)

### Hydrography

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

The present survey is adequate to supersede the charted hydrography within the common area.

### Dangers to Navigation

Two Danger to Navigation reports were submitted to Commander, Fifth Coast Guard District, Office of Aids to Navigation, Portsmouth, Virginia, for inclusion in the Local Notice to Mariners and to the Marine Chart Division, N/CS3x1, Silver Spring, Maryland. Copies of these reports are appended to the Descriptive Report.

### O. ADEQUACY OF SURVEY

This is an adequate hydrographic, side scan sonar and multibeam survey. Additional work is recommended in section N.1 of this report.

### R. MISCELLANEOUS

Chart compilation was done by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division, Silver Spring, Maryland. The following NOS charts were used for compilation

of the present survey:

12214 (43<sup>rd</sup> Ed., Dec 16/00)  
12216 (26<sup>th</sup> Ed., May 12/01)  
12304 (41<sup>st</sup> Ed., Apr 22/00)  
12317 (30<sup>th</sup> Ed., Feb 3/96)

*Robert Snow*

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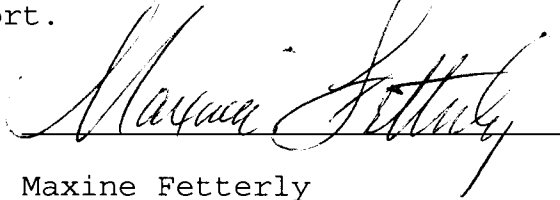
**Robert Snow**

Cartographic Technician  
Verification of Field Data  
Evaluation and Analysis

APPROVAL SHEET  
F00467

Initial Approvals:

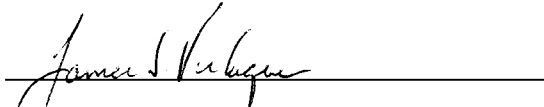
The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disapproval of charted data. The digital data have been completed and all revisions and additions made to the smooth sheet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



Date: 10/3/01

Maxine Fetterly  
Cartographer  
Atlantic Hydrographic Branch

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.



Date: 10/09/02

James S. Verlaque  
Lieutenant Commander, NOAA  
Chief, Atlantic Hydrographic Branch

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Final Approval:

Approved: Samuel P. DeBow, Jr. Date: March 25, 2002

Samuel P. DeBow, Jr.  
Captain, NOAA  
Chief, Hydrographic Surveys Division



75° 06' 30"

75° 06' 00"

75° 05' 30"

75° 05' 00"


75° 04' 30"

38° 51' 00"

DELAWARE BAY

149  
 149 150 149 149 147 146  
 149 148 148 147 147  
 149 148 148 147 145  
 148 148 147 147 146  
 147 148 148 147 146  
 147 147 146 146 146  
 146 147 146 146 146  
 145 147 146 145 146  
 145 146 148 145 145 146  
 144 145 145 145 146

38° 50' 30"

75° 06' 00" W  
 NAD 27  38° 50' 30" N

CHECKED BY: RS  
 7/25/01

F00467  
 NEW JERSEY -- DELAWARE  
 DELAWARE BAY  
 DELAWARE BAY AND APPROACHES  
 SCALE: 1:10,000  
 JULY- SEPT 2000  
 NORTH AMERICAN DATUM OF 1983  
 SOUNDINGS IN FEET AT MLLW  
 SHEET 1 OF 12  
 AWOIS ITEM NO. 9935

38° 50' 00"

28 34 37  
 26 26 27 33 35  
 26 26 26 26 26  
 25 26 26 26 26  
 24 24 24 24 24  
 23 23 23 23 23  
 22 22 22 22 22  
 21 21 21 21 21

75° 06' 30"

75° 06' 00"

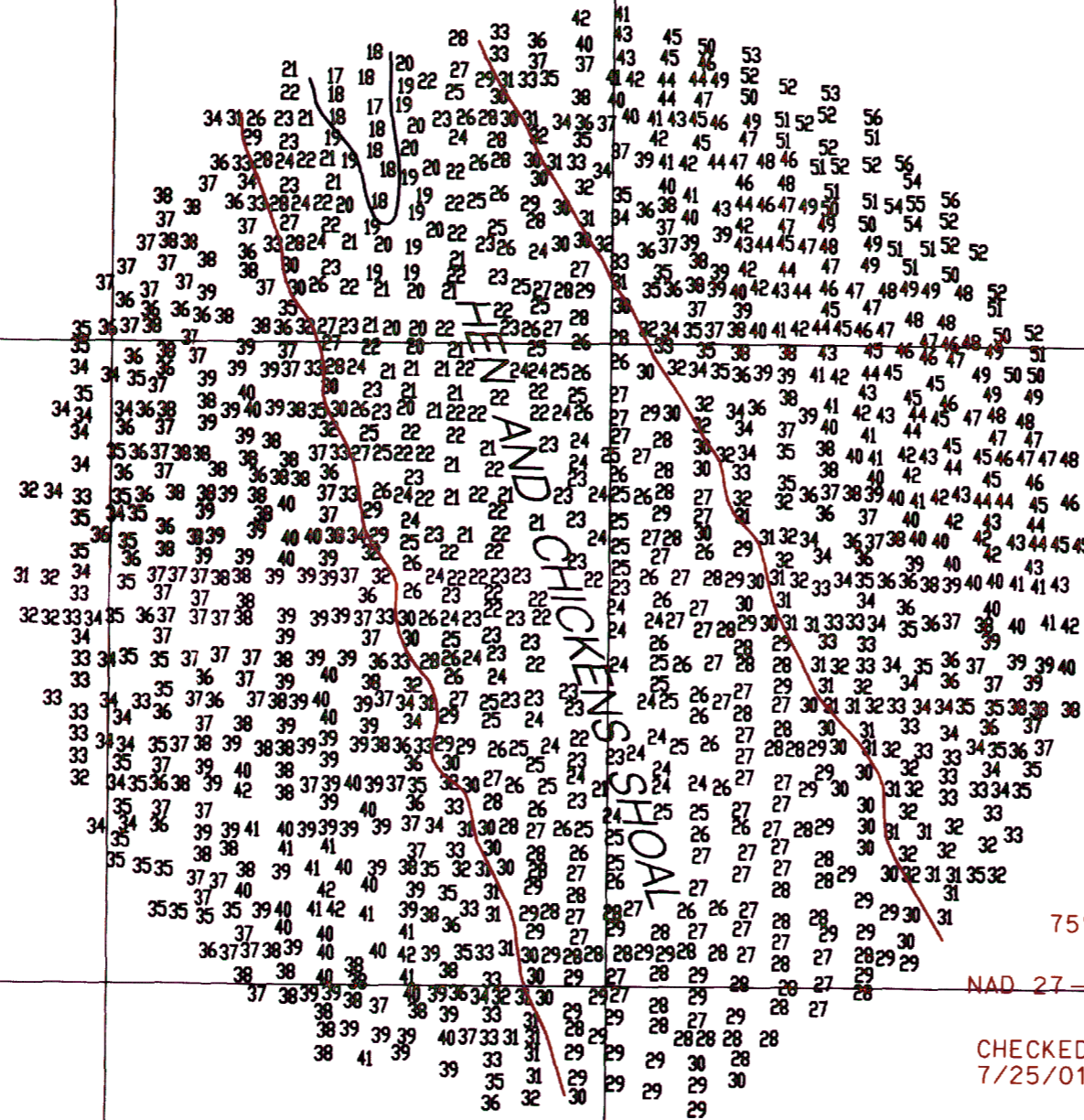
75° 05' 30"

75° 05' 00"

75° 04' 30"

CAPE  
HENLOPEN

NORTH ATLANTIC OCEAN



F00467  
 NEW JERSEY -- DELAWARE  
 DELAWARE BAY  
 DELAWARE BAY AND APPROACHES  
 SCALE: 1:20,000  
 JULY- SEPT 2000  
 NORTH AMERICAN DATUM OF 1983  
 SOUNDINGS IN FEET AT MLLW  
 SHEET 2 OF 12  
 AWOIS ITEM NO. 8132

Brown shoreline originates with NOS chart 12214, 43rd ED., Dec. 16/00 and is for orientation purposes only.

75° 02' 00" W  
 NAD 27  
 38° 44' 00" N  
 CHECKED BY: RS  
 7/25/01

75° 05' 00"

75° 04' 00"

75° 03' 00"

75° 02' 00"

75° 01' 00"

38° 46' 00"

38° 45' 00"

38° 44' 00"

75° 05' 00"

75° 04' 00"

75° 03' 00"

75° 02' 00"

75° 01' 00"

74° 51' 00"

74° 50' 30"

38° 31' 00"

# NORTH ATLANTIC OCEAN

74° 51' 00" W

NAD 27 38° 30' 30" N

CHECKED BY: RS  
7/25/01

72  
 72 72 72  
 71 72 73  
 72 72 73 74 74  
 73 73 73 74  
 73 73 74 WK 75 "NINA"  
 73 74 74 74 74  
 73 74 74 74

38° 30' 30"

F00467  
 NEW JERSEY -- DELAWARE  
 DELAWARE BAY  
 DELAWARE BAY AND APPROACHES  
 SCALE: 1:10,000  
 JULY- SEPT 2000  
 NORTH AMERICAN DATUM OF 1983  
 SOUNDINGS IN FEET AT MLLW  
 SHEET 3 OF 12  
 AWOIS ITEM NO. 1084

38° 30' 00"

74° 51' 00"

74° 50' 30"

74° 45' 30"

74° 45' 00"

74° 45' 30" W

NAD 27 38° 56' 00" N

38° 56' 00"

CHECKED BY: RS  
7/25/01

# NORTH ATLANTIC OCEAN

48 48 48 50  
 48 47 49 49  
 47 47 Wk "BEAR RIDGE"  
 48 49 49 47  
 48 48 49 48  
 48 47

46 48 48  
 46 47 47  
 45 46 48 48  
 47 48 31 Obstr 47  
 47 48 47 47

F00467

NEW JERSEY -- DELAWARE

38° 55' 30"

DELAWARE BAY

DELAWARE BAY AND APPROACHES

SCALE: 1:10,000

JULY- SEPT 2000

NORTH AMERICAN DATUM OF 1983

SOUNDINGS IN FEET AT MLLW

SHEET 4 OF 12

AWOIS ITEMS NOS. 10401a & 10401b

74° 45' 30"

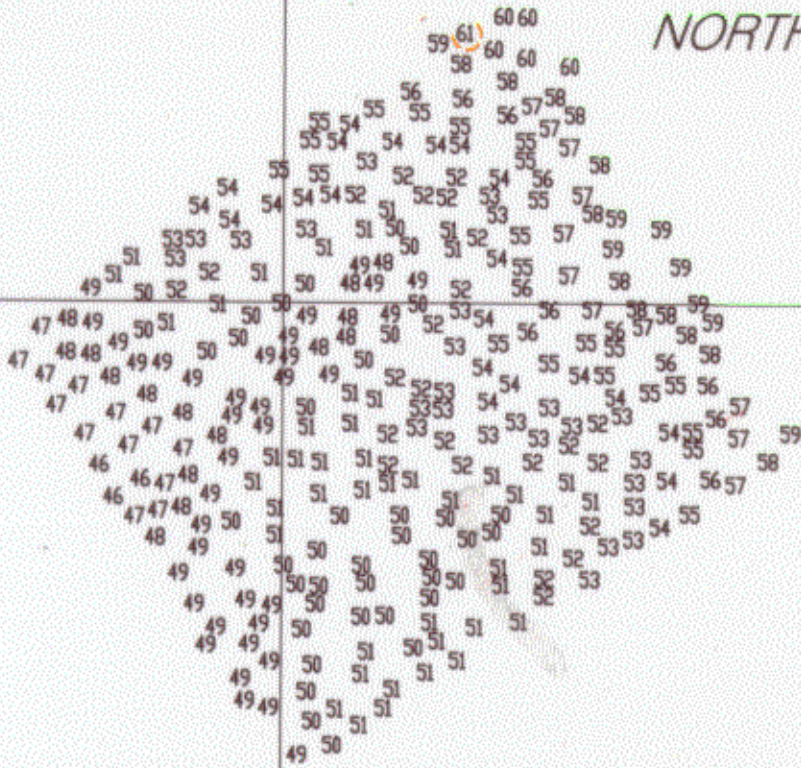
74° 45' 00"



74° 58' 30"

74° 58' 00"

NORTH ATLANTIC OCEAN



38° 42' 30"

74° 58' 30" W

NAD 27 38° 42' 00" N

38° 42' 00"

CHECKED BY: RS  
7/25/01

F00467  
 NEW JERSEY -- DELAWARE  
 DELAWARE BAY  
 DELAWARE BAY AND APPROACHES  
 SCALE: 1:10,000  
 JULY- SEPT 2000  
 NORTH AMERICAN DATUM OF 1983  
 SOUNDINGS IN FEET AT MLLW  
 SHEET 6 OF 12

74° 58' 30"

74° 58' 00"







75° 10' 30"

75° 10' 00"

39° 03' 00"

DELAWARE BAY

36 37 38 39  
 36 37 37  
 34 35 36 37 38 39 40 41  
 33 33 35 36 35 RK 39 40 41  
 33 34 34 36 37 38 39 40  
 34 35 36  
 34 35 36

75° 10' 30" W

NAD 27 39° 02' 30" N

39° 02' 30"

CHECKED BY RS  
7/25/01

F00467  
 NEW JERSEY -- DELAWARE  
 DELAWARE BAY  
 DELAWARE BAY AND APPROACHES  
 SCALE: 1:10,000  
 JULY - SEPT 2000  
 NORTH AMERICAN DATUM OF 1983  
 SOUNDINGS IN FEET AT MLLW  
 SHEET 9 OF 12  
 AWOIS ITEM NO. 9992

33 34 35  
 33 34 35 36 36 37  
 34 RK 35 36  
 34 35 35  
 34 34

39° 02' 00"

75° 10' 30"

75° 10' 00"

74° 59' 00"

74° 58' 30"

38° 47' 00"

# NORTH ATLANTIC OCEAN

52 52 52 53 53 53 50 51 54  
 51 52 52 52 53 50 52 53  
 51 52 53 52 53 50 51 52 52  
 52 52 53 51 50 51 50  
 52 52 53 49 50 51 50  
 52 52 49 50 51 52 49 50 52  
 53 50 50 51 52 53 49 50 52  
 53 52 51 51 52 53 50 51 52  
 53 51 53 53 53 52 52 52  
 52 52 53 50 51 51 55 50  
 54 54 54 53 53 53 50  
 55 53 54 55 54 52

74° 59' 00" W

NAD 27 38° 46' 30" N

38° 46' 30"

CHECKED BY: RS  
7/25/01

58 57 57 56  
 60 58 58 57  
 61 60 59 59 58 58  
 61 61 61 60 60 59 59  
 62 61 61 61 60 60  
 62 61 61 61 60  
 62 62 62 61  
 63 62 61

F00467  
 NEW JERSEY -- DELAWARE  
 DELAWARE BAY  
 DELAWARE BAY AND APPROACHES  
 SCALE: 1:10,000  
 JULY - SEPT 2000  
 NORTH AMERICAN DATUM OF 1983  
 SOUNDINGS IN FEET AT MLLW  
 SHEET 10 OF 12  
 AWOIS ITEM NO. 8975

38° 46' 00"

74° 59' 00"

74° 58' 30"

74° 58' 00"

74° 57' 30"

74° 57' 00"

*NORTH ATLANTIC OCEAN*

74° 57' 30" W

NAD 27

38° 45' 00" N

38° 45' 00"

CHECKED BY: RS  
7/25/01

61  
 62 62 62 61  
 62 62 62 61 61  
 62 62 62 61 61  
 62 61 61 61 61 61 61  
 61 61 61 61 61 61 61  
 61 61 61 61 61 61  
 61 61 61 61  
 61 61 61

38° 44' 30"

F00467  
 NEW JERSEY -- DELAWARE  
 DELAWARE BAY  
 DELAWARE BAY AND APPROACHES  
 SCALE: 1:10,000  
 JULY - SEPT 2000  
 NORTH AMERICAN DATUM OF 1983  
 SOUNDINGS IN FEET AT MLLW  
 SHEET 11 OF 12  
 AWOIS ITEMS NOS. 8402 & 9291

74° 58' 00"

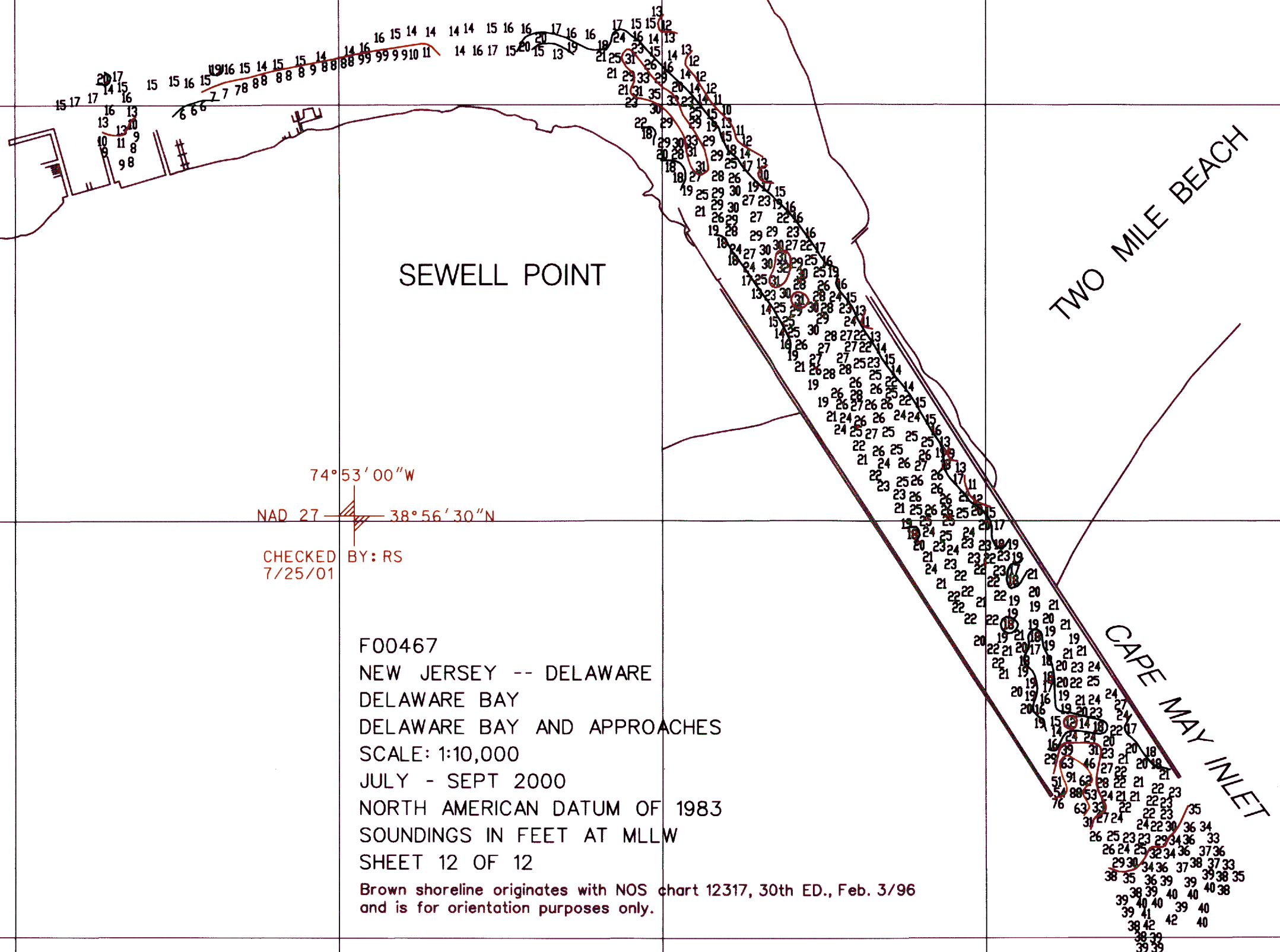
74° 57' 30"

74° 57' 00"

74° 53'30" 74° 53'00" 74° 52'30" 74° 52'00" 74° 51'30"

CAPE MAY HARBOR

38° 57'00"



SEWELL POINT

TWO MILE BEACH

74° 53' 00" W  
NAD 27 38° 56' 30" N

CHECKED BY: RS  
7/25/01

F00467  
 NEW JERSEY -- DELAWARE  
 DELAWARE BAY  
 DELAWARE BAY AND APPROACHES  
 SCALE: 1:10,000  
 JULY - SEPT 2000  
 NORTH AMERICAN DATUM OF 1983  
 SOUNDINGS IN FEET AT MLLW  
 SHEET 12 OF 12

Brown shoreline originates with NOS chart 12317, 30th ED., Feb. 3/96 and is for orientation purposes only.

CAPE MAY INLET

38° 56'30"

38° 56'00"

74° 53'30" 74° 53'00" 74° 52'30" 74° 52'00" 74° 51'30"

