# Descriptive Report

**Type of Survey:** Basic Navigable Area  
**Registry Number:** H12148

## Locality

**State:** Pennsylvania and New Jersey  
**General Locality:** Delaware River  
**Sub-locality:** South of Penn’s Landing to Billingsport Range

## Chief of Party

Bert Ho, NOAA

---
<table>
<thead>
<tr>
<th><strong>INSTRUCTIONS:</strong></th>
<th>The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NOAA FORM 77-28</strong></td>
<td><strong>U.S. DEPARTMENT OF COMMERCE</strong>&lt;br&gt;NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION</td>
</tr>
<tr>
<td><strong>HYDROGRAPHIC TITLE SHEET</strong></td>
<td><strong>REGISTRY NUMBER:</strong> H12148</td>
</tr>
<tr>
<td><strong>State:</strong></td>
<td>Pennsylvania and New Jersey</td>
</tr>
<tr>
<td><strong>General Locality:</strong></td>
<td>Delaware River</td>
</tr>
<tr>
<td><strong>Sub-Locality:</strong></td>
<td>Frankford Channel to 0.4nmi South of Penn’s Landing</td>
</tr>
<tr>
<td><strong>Scale:</strong></td>
<td>1:10,000</td>
</tr>
<tr>
<td><strong>Date of Survey:</strong></td>
<td>09/22/09 to 12/09/09</td>
</tr>
<tr>
<td><strong>Instructions Dated:</strong></td>
<td>10/02/09</td>
</tr>
<tr>
<td><strong>Project Number:</strong></td>
<td>S-D903-NRT5-09</td>
</tr>
<tr>
<td><strong>Change No.1 Dated:</strong></td>
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</tr>
<tr>
<td><strong>Change No.2 Dated:</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Vessel:</strong></td>
<td>NOAA NRT-5, S3002</td>
</tr>
<tr>
<td><strong>Chief of Party:</strong></td>
<td>Bert Ho, NOAA</td>
</tr>
<tr>
<td><strong>Surveyed by:</strong></td>
<td>NOAA Navigation Response Team 5 Personnel</td>
</tr>
<tr>
<td><strong>Soundings by:</strong></td>
<td>Kongsberg Simrad EM 3002 multibeam echosounder</td>
</tr>
<tr>
<td></td>
<td>Odom Echotrac CV/200 verticalbeam echosounder</td>
</tr>
<tr>
<td><strong>Graphic record checked by:</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Protracted by:</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Automated Plot:</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Verification by:</strong></td>
<td>Atlantic Hydrographic Branch Personnel</td>
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<tr>
<td><strong>Remarks:</strong></td>
<td>All Times are UTC.</td>
</tr>
<tr>
<td></td>
<td>This is a Basic Navigable Area Hydrographic Survey.</td>
</tr>
<tr>
<td></td>
<td>Projection is UTM Zone 18.</td>
</tr>
<tr>
<td><strong>Soundings in:</strong></td>
<td>Meters at MLLW</td>
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</tbody>
</table>

Office processing notes in red, bold, and italics.
# TABLE OF CONTENTS

## LIST OF FIGURES

- List of Figures: 5

## LIST OF TABLES

- List of Tables: 5

## A. AREA SURVEYED

## B. DATA ACQUISITION AND PROCESSING

- B.1 EQUIPMENT: 8
- B.2 QUALITY CONTROL: 8
  - B.2.1 Side Scan SONAR Quality Control: 8
  - B.2.2 Shallow Water Multibeam Quality Control: 8
  - B.2.3 Total Propagated Error: 9
  - B.2.4 Fieldsheet and Navigation Surfaces: 9
  - B.2.5 Single Beam Quality Control: 9
  - B.2.6 Crosslines: 10
  - B.2.7 Junctions: 10
- B.3 CORRECTIONS TO ECHO SOUNDINGS: 10

## C. VERTICAL AND HORIZONTAL CONTROL

- C.1 VERTICAL CONTROL: 12
- C.2 HORIZONTAL CONTROL: 12

## D. RESULTS AND RECOMMENDATIONS

- D.1 CHART COMPARISON: 13
  - D.1.1 General Agreement with Charted soundings: 13
  - D.1.2 AWOIS Items and Significant Contacts: 14
  - D.1.3 Dangers to Navigation (DToN): 14
  - D.1.4 Charted Features: 15
  - D.1.5 Charting Recommendations: 15
- D.2 ADDITIONAL RESULTS: 15
  - D.2.1 Aids to Navigation: 15
  - D.2.2 Bridges and Overhead Cables: 15
  - D.2.3 Submarine Cables and Pipelines: 15

## E. APPROVAL SHEET

- Approval Sheet: 16

## APPENDICES

- Appendix I – DToN Report
- Appendix II– Survey Features Report
- Appendix III– Progress Sketch
- Appendix IV– Tides and Water Levels
- Appendix V– Supplemental Survey Records and Correspondence
LIST OF FIGURES

FIGURE A-1: Overview of Survey Area  
FIGURE B-1: Caris QC Report, IHO Order Oneness v. Beam Number  
FIGURE D-1: RSD Pier investigation area Gloucester City, NJ

LIST OF TABLES

TABLE B-1: Total Propagated Error Parameters  
TABLE B-2: Bathymetry Surfaces, and Side Scan Mosaic Resolutions  
TABLE B-3: Caris QC report, IHO order 1% vs Beam Num
DESCRIPTIVE REPORT

to accompany
HYDROGRAPHIC SURVEY H12148

Scale of Survey:    1:10,000
Year of Survey:   2009
NOAA Navigation Response Team 5
               Bert Ho, Team Lead

A. AREA SURVEYED

This hydrographic survey was conducted in accordance with Hydrographic Survey Letter
Instructions for project S-D903-NRT5-09, H12148, Delaware River, Pennsylvania, New Jersey,
and Delaware. The original instructions are dated October 2, 2009.

This Descriptive Report pertains to an area of approximately 3.13 SNM, of Delaware River from
0.4nmi south of Penn’s Landing to Billingsport Range. The assigned registry number for this
sheet is H12148, as prescribed in the Letter Instructions.

The purpose of the CY 2009-2010 operations in this area were to provide contemporary surveys
to update National Ocean Service (NOS) nautical charts as the numerous ports on the Delaware
River have been designated critical survey areas.

For complete survey limits, see figure A-1 on the following page.

| Linear nautical miles of single beam only sounding lines - mainscheme only | 75.6 |
| Linear nautical miles of side scan sonar only lines - mainscheme only      | 77.1 |
| Linear nautical miles of any combination of the above techniques           | 77.1 |
| Linear nautical miles of crosslines from single beam and multibeam combined| 14.3 |
| Linear nautical miles of developments other than mainscheme lines         | 3.4  |
| Number of bottom samples collected                                        |      |
| Number of items investigated that required additional time/effort in the field beyond the above survey operations | 1 CEF file (submitted to MCD directly) |

Total square nautical miles 3.13

Dates of acquisition: September 22, 2009 to December 9, 2009

Concur.
Figure A-1: Outline of survey area
B. DATA ACQUISITION AND PROCESSING

B.1 EQUIPMENT

Data were acquired by NOAA NRT-5 S3002. NOAA Survey Vessel S3002 is an approximately 9m aluminum SeaArk outboard driven vessel with an average multibeam transducer draft of 0.5 meters.

NOAA S3002 acquired both bathymetry and imagery data in the project area. Side scan sonar data were acquired with a towed Klein 3000 sonar system (SSS). Bathymetry data were acquired with both an Odom Echotrac C/V 200 verticalbeam echosounder (VBES), and a Kongsberg Simrad EM 3002 multibeam echosounder (MBES). Positioning and attitude were determined with a TSS POS/MV 320 (version 4) GPS aided inertial navigation system. Concur.

B.2 QUALITY CONTROL

B.2.1 Side Scan Sonar Quality Control

Daily confidence checks were made by observing the outer ranges of the side scan sonar image trace. A good check consisted of distinguishing linear contacts across the entire range of the side scan trace. Navigation data were reviewed, fliers were rejected with interpolation. Significant sand waves were noted throughout bends in the Delaware River and were used for confidence checks.

In accordance with the project instructions, 200% SSS bottom coverage was collected for this survey at 75m range scale. A SSS image mosaic was created at 1m resolution for submission (Table B-2). Concur.

B.2.2 Multibeam Echosounder Quality Control

Multibeam echosounder data were acquired at 100% coverage for SSS contact development, and areas deemed navigationally significant by the hydrographer. In order to successfully operate the EM3002 with the SIS software, sound speed casts were completed at the start of the survey day (and every 4 hours afterwards) and manually entered into the SIS program as an ASVP file, which is a Simrad format created by Velocwin. Surface sound velocity was provided by a 2nd Odom Digibar and it was fed directly into the SIS program in real time. There were no faults with the MBES system which adversely effected data integrity. Navigation data were reviewed; any fliers were rejected with interpolation. A small variable Navigation Timing error was noted after review of the data in post-processing within Caris’ subset editor. The Nav error is within the allowable horizontal error budget, but it should be noted that certain vertical features may appear to have multiple peaks. Least depths were taken from the shallowest sounding. For
detailed discussion of MBES system calibrations, data acquisition, and data processing refer to this project’s DAPR.  *Concur.*

### B.2.3 Total Propagated Error

Total Propagated Error (TPE) parameters for sound speed and tide data for H12148 are shown in table B-1.  The estimated tidal error contribution to the total survey error budget in the vicinity of Delaware River is included in the TCARI grid.  Sound speed TPE values were used in accordance with HSTP guidelines regarding frequency of surface and water column sound speed measurements.  *Concur.*

Table B-1.  Total Propagated Error parameters as applied in Caris.

<table>
<thead>
<tr>
<th>Total Propagated Error Values</th>
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</thead>
<tbody>
<tr>
<td>Tide Values</td>
</tr>
<tr>
<td>Measured</td>
</tr>
<tr>
<td>-------------------------------</td>
</tr>
<tr>
<td>0.0</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Sound Speed Values</th>
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</thead>
<tbody>
<tr>
<td>Measured</td>
</tr>
<tr>
<td>Surface</td>
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<tr>
<td>4.0</td>
</tr>
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### B.2.4 Fieldsheets and Navigation Surfaces

Caris HIPS combined uncertainty weighted CUBE surfaces were created for this project.  For MBES data surfaces were created and submitted at 0.50m resolution.  A combined uncertainty weighted CUBE surface was created for VBES data at 4.00m resolution.  The MBES CUBE surface finalized weighted grid is included in the PSS.  *Concur.*

### B.2.5 Single Beam Quality Control

Navigation data were reviewed, fliers were rejected with interpolation.  There were no unusual events associated with the collection of VBES data for this project.

Refer to this project’s DAPR for detailed discussion of VBES system calibrations, data acquisition, and data processing.  *See H-Cell Report.*
Table B-2: H12148 Bathymetry surfaces and Side Scan mosaic resolutions.

<table>
<thead>
<tr>
<th>Fieldsheet</th>
<th>Surface/Mosaic Name</th>
<th>Grid Type</th>
<th>Resolution</th>
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<tbody>
<tr>
<td>H12148</td>
<td>H12148_MBES_CUBE_50cm</td>
<td>Cube, Order 1</td>
<td>0.50m</td>
</tr>
<tr>
<td>H12148</td>
<td>H12148_MBES_CUBE_50cm_Final</td>
<td>Cube, Order 1</td>
<td>0.50m</td>
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<tr>
<td>H12148</td>
<td>H12148_VBES_CUBE_4m</td>
<td>Cube, Order 1</td>
<td>4.00m</td>
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<tr>
<td>H12148</td>
<td>H12148_VBES_CUBE_4m_Final</td>
<td>Cube, Order 1</td>
<td>4.00m</td>
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<td>H12148</td>
<td>H12148_SSS_1m</td>
<td>SSS Mosaic</td>
<td>1.00m</td>
</tr>
</tbody>
</table>

B.2.6 Crosslines

For this survey 14.3 linear NM of VBES crosslines were acquired, this is approximately 18.9% of the mainscheme VBES bathymetry linear NM. A visual examination of approximately 10% of crossline-mainsheme common areas showed agreement between crosslines and mainscheme lines to within 1-2 feet. For a list of all crosslines acquired for this project, tabulated by DN and line file name, please refer to the processing logs located in the separates section of the DR submission package. Concur.

B.2.7 Junctions

Survey H12148 junctions with contemporary survey H12147 and H12149. Visual examination of all junction areas showed agreement between bathymetry data to within 1 foot. Concur with clarification. See H-Cell report D.2.a.

B.3 CORRECTIONS TO ECHO SOUNDING

All methods or instruments used were as described in the project DAPR. All sound velocity casts are included in the PSS. SV Casts were not used in post processing for MB data in Caris due to the acquisition software’s (SiS) requirement to use an ASVP in real time. Post processing with an svp applied in Caris was found to create a double corrections of the data. See email correspondence with HSTP. Concur.
Figure B-3: Caris QC report, IHO order 1% vs Beam Number.
C. VERTICAL AND HORIZONTAL CONTROL

C.1 VERTICAL CONTROL

The tidal datum for this project is Mean Lower Low Water (MLLW). The operating National Water Level Observation Network (NWLON) stations at Reedy Point, DE (8551910) and Philadelphia, PA (8545240) served as datum control for the survey area including determination at each subordinate station. The operating stations at Marcus Hook, PA (8540433), Tacony-Palmyra (8538886), Reedy Point, DE (8551910), and Philadelphia, PA (8545240) provided residuals for this project. A Request for Approved Tides was sent to N/OPS1 on October 29, 2009 (Appendix III). Verified tides from the N/OPS1 CO-OPS website were downloaded and applied to all sounding data via TCARI in Pydro. Concur.

C.2 HORIZONTAL CONTROL

The horizontal datum used for this survey is the North American Datum of 1983 (NAD 83), projected using UTM zone 18.

Sounding positional control was determined using the Global Positioning System (GPS) corrected by U.S. Coast Guard differential GPS (DGPS) beacon stations. The DGPS beacon used for this survey was Reedy Point, DE. No horizontal control stations were established for this survey.

Horizontal dilution of precision (HDOP) was monitored during acquisition, and did not exceed 4.00. Adequate satellite coverage was maintained throughout the survey period. Concur.
D. RESULTS AND RECOMMENDATIONS

D.1 CHART COMPARISON

The charts affected by this survey are:

<table>
<thead>
<tr>
<th>Chart Number</th>
<th>Edition</th>
<th>Edition Date</th>
<th>Scale</th>
</tr>
</thead>
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<tr>
<td>12312</td>
<td>55th</td>
<td>August 2009</td>
<td>1:40000</td>
</tr>
</tbody>
</table>

ENC Cell Name

US5PA12M


D.1.1 General Agreement with Charted soundings

Sounding data generally agreed with charted depths to within 1-2 feet, navigationally significant differences from charted depths are addressed in Appendix II of this report. There was one area highlighted by RSD for visual inspection regarding a pier north of Gloucester City, NJ. RSD requested NRT5 to verify that the pier is no longer present. It has been confirmed that the pier is indeed gone. See image below regarding area in question.

Additional SB data was acquired at the request of the Delaware River Pilots via the Philadelphia Navigation Manager. See email regarding Additional_Anch_areas. Areas of survey included partial coverage at 100% of the Federal Channel. Comparisons were only made to ensure acquired depths met or were deeper than cleared depths for the channel. Concur.
D.1.2 AWOIS Items and Significant Contacts

There were 5 full investigation AWOIS items assigned within the survey limits of H12148. The search area was covered with 200% SSS and 100% MBES when confirmed. The updates to the AWOIS database were made in Pydro in the remarks and recommendations, and were added to the feature reports. See Appendix II. *Concur.*

D.1.3 Dangers to Navigation

There was originally one DTON submitted for survey H12148. The alleged DTON is a shoal within the Federal Channel slightly north of the Walt Whitman Bridge on the Pennsylvania side of the channel. Correspondences with the Navigation Manager regarding the DTON are in Appendix V. Based on correspondences with the USACE, the area is a known shoal and will not be submitted as a DTON. *See H-Cell Report section D.1.3.*
D.1.4 Charted Features

Hydrographer recommended changes to charted items are listed in Appendix II of this report as well as in the PSS. All charted items not specifically addressed in Appendix II are recommended to be retained as charted by the hydrographer. Concur.

D.1.5 Charting Recommendations

Hydrographer recommendations for discrete items are included in Appendix II of this report as well as in the PSS. Survey H12148 is complete and adequate to supersede charted soundings in their common areas. See H-Cell Report section D.1.5.

D.2 ADDITIONAL RESULTS

D.2.1 Aids to Navigation

The hydrographer recommends no modifications to any aids to navigation to note. All were verified as accurate. Concur.

D.2.2 Bridges and Overhead Cables

There is one bridge and no overhead cables in the survey area. Concur.

D.2.3 Submarine Cables and Pipelines

There are no charted submarine cable and three pipeline areas in the survey area. Concur.
E. APPROVAL SHEET

S-D903
Delaware River
Pennsylvania, New Jersey, Delaware

Delaware River
Survey Registry No. H12148

Field operations for this survey were conducted under my daily supervision with frequent checks of progress and adequacy. All fieldsheets, bathymetry models, this Descriptive Report, and all accompanying records and data are approved.

Submitted in association with this descriptive report has been a series of reports and data:

- 2009 Data Acquisition and Processing Report (submitted with this report)
- 2009 HSRR Memo (submitted with this report)

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

Respectfully,

John Doroba, PST/NOAA
NRT-5

Bert Ho, NOAA
Team Lead NRT-5
APPENDIX I

DANGERS TO NAVIGATION REPORT

No DToNs for H12148. *Concur.*
APPENDIX II

SURVEY FEATURES REPORT
H12148 DR_UnCharted

Registry Number: H12148
State: Pennsylvania
Locality: Delaware River
Sub-locality: Philadelphia
Project Number: S-D903-NRT5-09

Charts Affected

<table>
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<tr>
<th>Number</th>
<th>Edition</th>
<th>Date</th>
<th>Scale (RNC)</th>
<th>RNC Correction(s)*</th>
</tr>
</thead>
</table>
| 12313  | 52nd    | 12/01/2008 | 1:15,000 (12313_1) | USCG LNM: 8/24/2010 (10/12/2010)  
NGA NTM: 4/12/1997 (10/16/2010) |
| 12312  | 55th    | 08/01/2009 | 1:40,000 (12312_1) | USCG LNM: 6/8/2010 (10/12/2010)  
NGA NTM: 1/24/1998 (10/16/2010) |
| 13003  | 49th    | 04/01/2007 | 1:1,200,000 (13003_1) | [L]NTM: ? |
| 14500  | 27th    | 10/01/2002 | 1:1,500,000 (14500_1) | [L]NTM: ? |

* Correction(s) - source: last correction applied (last correction reviewed--"cleared date")

Features

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<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Feature Type</th>
<th>Survey Depth</th>
<th>Survey Latitude</th>
<th>Survey Longitude</th>
<th>AWOIS Item</th>
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</thead>
<tbody>
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<td>1.1</td>
<td>10ft Obstn 482/1</td>
<td>Obstruction</td>
<td>3.09 m</td>
<td>39° 55' 36.6&quot; N</td>
<td>075° 07' 52.8&quot; W</td>
<td>---</td>
</tr>
<tr>
<td>1.2</td>
<td>USACE Shoal 802/148</td>
<td>Shoal</td>
<td>8.63 m</td>
<td>39° 54' 25.3&quot; N</td>
<td>075° 07' 54.3&quot; W</td>
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</tr>
<tr>
<td>1.3</td>
<td>12ft Rock 218/100</td>
<td>Rock</td>
<td>3.77 m</td>
<td>39° 53' 06.8&quot; N</td>
<td>075° 08' 41.6&quot; W</td>
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<tr>
<td>1.4</td>
<td>10ft Rock 802/246</td>
<td>Rock</td>
<td>3.10 m</td>
<td>39° 53' 07.3&quot; N</td>
<td>075° 08' 48.2&quot; W</td>
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<tr>
<td>1.5</td>
<td>11ft Rock 195/243</td>
<td>Rock</td>
<td>3.28 m</td>
<td>39° 53' 11.9&quot; N</td>
<td>075° 09' 44.6&quot; W</td>
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<tr>
<td>1.6</td>
<td>6ft Obstn 555/178</td>
<td>Obstruction</td>
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<td>075° 09' 46.6&quot; W</td>
<td>---</td>
</tr>
<tr>
<td>1.7</td>
<td>15ft Rock 859/103</td>
<td>Rock</td>
<td>4.51 m</td>
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<td>1.8</td>
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<td>075° 07' 46.1&quot; W</td>
<td>---</td>
</tr>
<tr>
<td>1.10</td>
<td>38ft Wk 1123/111</td>
<td>Wreck</td>
<td>11.71 m</td>
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<td>075° 08' 09.9&quot; W</td>
<td>---</td>
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<tr>
<td>1.11</td>
<td>SSS Obstn 0001</td>
<td>Obstruction</td>
<td>[None]</td>
<td>39° 55' 30.4&quot; N</td>
<td>075° 08' 09.3&quot; W</td>
<td>---</td>
</tr>
</tbody>
</table>
1 - DR_UnCharted
1.1) 10ft Obstn 482/1

Survey Summary

Survey Position: 39° 55' 36.6" N, 075° 07' 52.8" W
Least Depth: 3.09 m (= 10.15 ft = 1 fm 4.15 ft)
TPU (±1.96σ): THU (TPEh) ±1.966 m ; TVU (TPEv) ±0.214 m
Survey Line: h12148_sheetb / nrt5_s3002_em3002_mbes / 2009-301 / 001_1412
Profile/Beam: 482/1
Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Area was covered with 200% SSS and 100% MBES. TCARI verified tides were applied. Obstruction on river bank.

Feature Correlation

<table>
<thead>
<tr>
<th>Address</th>
<th>Feature</th>
<th>Range</th>
<th>Azimuth</th>
<th>Status</th>
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</thead>
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<td>000.0</td>
<td>Primary</td>
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<td>0001</td>
<td>4.56</td>
<td>174.3</td>
<td>Secondary</td>
</tr>
</tbody>
</table>

Hydrographer Recommendations

Hydrographer recommends charting this obstruction at the location of the LD. -bsh

Cartographically-Rounded Depth (Affected Charts):
10ft (12313_1, 12312_1)
1 ¾fm (13003_1, 14500_1)

S-57 Data

Geo object 1: Obstruction (OBSTRN)
Attributes: QUASOU - 6:least depth known
SORDAT - 20091209
SORIND - US,US,graph,H12148
TECSOU - 2,3:found by side scan sonar,found by multi-beam
VALSOU - 3.094 m
VERDAT - 12:Mean lower low water
WATLEV - 3: always under water/submerged

Office Notes

Concur. Chart obstruction per present survey findings.
Feature Images

Figure 1.1.1
1.2) USACE Shoal 802/148

Survey Summary

Survey Position: 39° 54' 25.3" N, 075° 07' 54.3" W
Least Depth: 8.63 m (= 28.33 ft = 4.721 fm = 4 fm 4.33 ft)
TPEU (±1.96σ): THU (TPEh) ±1.965 m ; TVU (TPEv) ±0.224 m
Survey Line: h12148_sheetb / nrt5_s3002_em3002_mbes / 2009-301 / 008_1430
Profile/Beam: 802/148
Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Area was covered with 200% SSS and 100% MBES. TCARI verified tides were applied. Significant shoal, originally submitted as a DTON, but USACE is aware of shoal. Channel is cleared to 40 ft, LD measures 28ft.

Feature Correlation

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Hydrographer Recommendations

Hydrographer recommends non-chart due to USACE jurisdiction and they are aware of shoal. -bsh

Cartographically-Rounded Depth (Affected Charts):
28ft (12313_1, 12312_1)
4 ¾fm (13003_1, 14500_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: QUASOU - 6:least depth known
SORDAT - 20091209
SORIND - US,US,graph,H12148
TECSOU - 1,3:found by echo-sounder,found by multi-beam
VERDAT - 12:Mean lower low water
Office Notes

Concur - Shoal noted and should be followed-up with USACE - e-mail sent to Navigation Manager (Danley). See appendix V, additional correspondence.
Feature Images

Figure 1.2.1
Figure 1.2.2
1.3) 12ft Rock 218/100

Survey Summary

Survey Position: 39° 53' 06.8" N, 075° 08' 41.6" W
Least Depth: 3.77 m (= 12.36 ft = 2 fm 0.36 ft)
TPU (±1.96σ): THU (TPEh) ±1.962 m; TVU (TPEv) ±0.216 m
Timestamp: 2009-301.15:02:49.761 (10/28/2009)
Survey Line: h12148_sheetb / nrt5_s3002_em3002_mbes / 2009-301 / 025_1502
Profile/Beam: 218/100
Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Area was covered with 200% SSS and 100% MBES. TCARI verified tides were applied. Rock of significant height.

Feature Correlation

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Hydrographer Recommendations

Chart Rk with LD of 3.77m (12.4 ft).

Cartographically-Rounded Depth (Affected Charts):
12ft (12313_1, 12312_1)
2fm (13003_1, 14500_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes:
QUASOU - 6:least depth known
SORDAT - 20091209
SORIND - US,US,graph,H12148
TECSOU - 2,3:found by side scan sonar,found by multi-beam
VALSOU - 3.766 m
VERDAT - 12:Mean lower low water
WATLEV - 3: always under water/submerged

Office Notes

Concur. Chart rock per present survey findings.
Feature Images

Figure 1.3.1
1.4) 10ft Rock 802/246

Survey Summary

Survey Position: 39° 53' 07.3" N, 075° 08' 48.2" W
Least Depth: 3.10 m (= 10.18 ft = 1 fm 4.18 ft)
TPU (±1.96σ): THU (TPEh) ±1.966 m ; TVU (TPEv) ±0.211 m
Survey Line: h12148_sheetb / nrt5_s3002_em3002_mbes / 2009-301 / 027_1504
Profile/Beam: 802/246
Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Area was covered with 200% SSS and 100% MBES. TCARI verified tides were applied. Rock.

Feature Correlation

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Hydrographer Recommendations

Hydrographer recommends not charting this rock. -bsh

Cartographically-Rounded Depth (Affected Charts):
10ft (12313_1, 12312_1)
1 ¾fm (13003_1, 14500_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: QUASOU - 6:least depth known
SORDAT - 20091209
SORIND - US,US,graph,H12148
TECSOU - 2,3:found by side scan sonar,found by multi-beam
VALSOU - 3.103 m
VERDAT - 12:Mean lower low water
WATLEV - 3:always under water/submerged

**Office Notes**

Do not Concur. Chart rock at surveyed position with least depth of 3.10m (10.2ft).
1.5) 11ft Rock 195/243

Survey Summary

Survey Position: 39° 53’ 11.9“ N, 075° 09’ 44.6“ W
Least Depth: 3.28 m (= 10.76 ft = 1 fm 4.76 ft)
TPU (±1.96σ): THU (TPEh) ±1.966 m ; TVU (TPEv) ±0.211 m
Survey Line: h12148_sheetb / nrt5_s3002_em3002_mbes / 2009-301 / 029_1521
Profile/Beam: 195/243
Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Area was covered with 200% SSS and 100% MBES. TCARI verified tides were applied. Rock of significant height.

Feature Correlation

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Hydrographer Recommendations

Hydrographer recommends charting this rock with a sounding with the LD in the data. -bsh

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: QUASOU - 6:least depth known
SORDAT - 20091209
SORIND - US,US,graph,H12148
TECSOU - 2,3:found by side scan sonar,found by multi-beam
VALSOU - 3.279 m
VERDAT - 12:Mean lower low water
WATLEV - 3:always under water/submerged
Office Notes

Do not concur. Rock does not rise appreciably from surrounding surface. Chart digital data.
Feature Images

Figure 1.5.1
1.6) 6ft Obstn 555/178

Survey Summary

Survey Position: 39° 53’ 12.5” N, 075° 09’ 46.6” W
Least Depth: 2.02 m (= 6.62 ft = 1.104 fm = 1 fm 0.62 ft)
TPU (±1.96σ): THU (TPEh) ±1.962 m ; TVU (TPEv) ±0.210 m
Survey Line: h12148_sheetb / nrt5_s3002_em3002_mbes / 2009-301 / 029_1521
Profile/Beam: 555/178
Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Area was covered with 200% SSS and 100% MBES. TCARI verified tides were applied. Obstruction.

Feature Correlation

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Hydrographer Recommendations

Chart Obstn with LD of 2.02m (6.6 ft).

Cartographically-Rounded Depth (Affected Charts):
6ft (12313_1, 12312_1)
1fm (13003_1, 14500_1)

S-57 Data

Geo object 1: Obstruction (OBSTRN)
Attributes: QUASOU - 6: least depth known
            SORDAT - 20091209
            SORIND - US,US,graph,H12148
            TECSOU - 2,3: found by side scan sonar, found by multi-beam
            VALSOU - 2.019 m
VERDAT - 12: Mean lower low water
WATLEV - 3: always under water/submerged

**Office Notes**

Concur. Chart obstruction per present survey findings.
Feature Images

Figure 1.6.1
1.7) 15ft Rock 859/103

Survey Summary

Survey Position: 39° 53' 06.7" N, 075° 09' 50.9" W
Least Depth: 4.51 m (= 14.80 ft = 2 fm 2.80 ft)
TPU (±1.96σ): THU (TPEh) ±1.964 m; TVU (TPEv) ±0.218 m
Survey Line: h12148_sheetb / nrt5_s3002_em3002_mbes / 2009-301 / 035_1518
Profile/Beam: 859/103
Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Area was covered with 200% SSS and 100% MBES. TCARI verified tides were applied. Rock of significant height.

Feature Correlation

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Hydrographer Recommendations

Hydrographer recommends charting this rock at the position in the data with the LD from the data. -bsh

Cartographically-Rounded Depth (Affected Charts):
15ft (12313_1, 12312_1)
2 ½fm (13003_1, 14500_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: QUASOU - 6:least depth known
SORDAT - 20091209
SORIND - US,US,graph,H12148
TECSOU - 2,3:found by side scan sonar,found by multi-beam
VALSOU - 4.511 m
VERDAT - 12: Mean lower low water
WATLEV - 3: always under water/submerged

Office Notes

Concur. Chart rock per present survey findings.
Feature Images

Figure 1.7.1
Figure 1.7.2

Figure 1.7.3

Page 26
1.8) 40ft Obstn 732/150

Survey Summary

Survey Position: 39° 53’ 00.8” N, 075° 11’ 18.0” W
Least Depth: 12.16 m (= 39.89 ft = 6.648 fm = 6 fm 3.89 ft)
TPU (±1.96σ): THU (TPEh) ±1.968 m; TVU (TPEv) ±0.230 m
Timestamp: 2009-301.15:39:34.676 (10/28/2009)
Survey Line: h12148_sheetb / nrt5_s3002_em3002_mbes / 2009-301 / 048_1538
Profile/Beam: 732/150
Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Found by SAR Processor. Feature acquired with 100% Klein 3000 SSS and OD MBES.

Feature Correlation

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Hydrographer Recommendations

Chart digital data or Obstn with LD of 12.1m (40 ft).

S-57 Data

Geo object 1: Obstruction (OBSTRN)
Attributes:
QUASOU - 6:least depth known
SORDAT - 20091209
SORIND - US,US,graph,H12148
TECSOU - 2.3:found by side scan sonar,found by multi-beam
VALSOU - 12.157 m
VERDAT - 12:Mean lower low water
WATLEV - 3:always under water/submerged
Office Notes

Do not concur. Least depth is insignificant due to surrounding depths. Chart digital data.
1.9) SSS Obstrn 0003

Survey Summary

Survey Position: 39° 54' 13.2" N, 075° 07' 46.1" W
Least Depth: [None]
TPU (±1.96σ): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2010-308.03:28:17 (11/04/2010)
Survey Line: h12148_sheetb / nrt5_s3002_klein3000_sss / 2009-267 / sonar_data090924130600
Contact/Point: 0003/1
Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Obstrn found outside the project channel with 200% Klein 3000 SSS. Feature has no bathymetry development. Found by field unit but assessed as scour. Feature has solid hit from both sides with shadow, indicating a feature proud of the bottom. Height of object is 1.7m with a closest VBES sounding of 15.0m. LD estimated to be 13.3m (43.6 ft). Feature appears to be a side-lain pipe.

Feature Correlation

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Hydrographer Recommendations

Chart Obstrn w/LD of 13.3m (43.6 ft).

S-57 Data

Geo object 1: Obstruction (OBSTRN)
Attributes: QUASOU - 9:value reported (not confirmed)
SORDAT - 20091209
SORIND - US,US,graph,H12148
TECSOU - 2:found by side scan sonar
VERDAT - 12:Mean lower low water
WATLEV - 3:always under water/submerged
Office Notes

Concur. Chart obstruction per present survey findings.
1.10) 38ft Wk 1123/111

Survey Summary

Survey Position: 39° 53.383” N, 075° 08.009” W
Least Depth: 11.71 m (= 38.41 ft = 6.401 fm = 6 fm 2.41 ft)
TPU (±1.96σ): THU (TPEh) ±1.968 m; TVU (TPEv) ±0.229 m
Survey Line: h12148_sheetb / nrt5_s3002_em3002_mbes / 2009-301 / 012_1440
Profile/Beam: 1123/111
Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Area was covered with 200% SSS and 100% MBES. TCARI verified tides have been applied. Wreck, possibly a barge.

Feature Correlation

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Hydrographer Recommendations

Chart non-dangerous Wk with LD of 11.71m (38.4 ft).

Cartographically-Rounded Depth (Affected Charts):
38ft (12313_1, 12312_1)
6 ¼fm (13003_1, 14500_1)

S-57 Data

Geo object 1: Wreck (WRECKS)
Attributes: CATWRK - 1: non-dangerous wreck
            CONVIS - 2: not visual conspicuous
            QUASOU - 6: least depth known
            SORDAT - 20091209
SORIND - US, US, graph, H12148
TECSOU - 2, 3: found by side scan sonar, found by multi-beam
VALSOU - 11.706 m
VERDAT - 12: Mean lower low water
WATLEV - 3: always under water/submerged

**Office Notes**

Do not concur. Least depth on wreck is insignificant. Chart as CS sounding.
Feature Images

Figure 1.10.1
1.11) SSS Obstn 0001

Survey Summary

Survey Position: 39° 55' 30.4" N, 075° 08' 09.3" W
Least Depth: [None]
TPU (±1.96σ): THU (TPEh) [None] ; TVU (TPEv) [None]
Survey Line: h12148_sheetb / nrt5_s3002_klein3000_sss / 2009-267 / sonar_data090924124900
Contact/Point: 0001/1
Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Possible obstruction near edge of project channel found with 200% Klein 3000 SSS.

Feature Correlation

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Hydrographer Recommendations

Chart Obstn with LD of 9.35m (30.7 ft).

Feature found by SAR processor and has no bathymetry development. SSS detection with greatest height off bottom is near nadir. Slant range height is 3.85m with nearest VBES sounding of 13.2m. Estimated LD of 9.35m (30.7 ft).

S-57 Data

Geo object 1: Obstruction (OBSTRN)
Attributes: QUASOU - 9:value reported (not confirmed)
TECSOU - 2:found by side scan sonar
VERDAT - 12:Mean lower low water
WATLEV - 3:always under water/submerged
Office Notes

Do not concur. Survey F00594 conducted by the Bay Hydro II covers this area with multibeam. An object exists in the multibeam but the least depth on the feature is insignificant. Do not chart obstruction.
H12148 DR_AWOIS

Registry Number: H12148
State: Pennsylvania
Locality: Delaware River
Sub-locality: Philadelphia
Project Number: S-D903-NRT5-09
Survey Date:

Charts Affected

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* Correction(s) - source: last correction applied (last correction reviewed--"cleared date")

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1.1) AWOIS #1453 - ANDRIA(ANDREW) DORIA

No Primary Survey Feature for this AWOIS Item

Search Position: 39° 52’ 30.4” N, 075° 12’ 28.6” W
Historical Depth: [None]
Search Radius: 0
Search Technique: [None]
Technique Notes: [None]

History Notes:
S-D903-NRT5-09, H12148--No wreck found. Hydrographer recommends removal from the AWOIS database. (11/13/09, BSH)

Survey Summary

Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Area was covered with 200% SSS. No wreck found.

Feature Correlation

<table>
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<th>Azimuth</th>
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</table>

Hydrographer Recommendations

Hydrographer recommends removal from the AWOIS database. -bsh

S-57 Data

[None]

Office Notes

Concur. Update AWOIS database. No charting necessary.
1.2) AWOIS #1454 - AUGUSTA

No Primary Survey Feature for this AWOIS Item

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<thead>
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<td>Historical Depth:</td>
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<td>Search Radius:</td>
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<td>Search Technique:</td>
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</tr>
<tr>
<td>Technique Notes:</td>
<td>[None]</td>
</tr>
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</table>

History Notes:
S-D903-NRT5-09, H12148, No wreck found. Hydrographer recommends removal. (11/13/09, BSH)

Survey Summary

<table>
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<tr>
<th>Charts Affected:</th>
<th>12313_1, 12312_1, 13003_1, 14500_1</th>
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</thead>
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Remarks:
Area was covered with 200% SSS. No wreck found.

Feature Correlation

<table>
<thead>
<tr>
<th>Address</th>
<th>Feature</th>
<th>Range</th>
<th>Azimuth</th>
<th>Status</th>
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<td>000.0</td>
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</table>

Hydrographer Recommendations

Hydrographer recommends removal from the AWOIS database. -bsh

S-57 Data

[None]

Office Notes

Concur. Update AWOIS database. No charting necessary.
1.3) AWOIS #13807 - AWOIS 13807 OBSTRUCTION

No Primary Survey Feature for this AWOIS Item

Search Position: 39° 51' 33.3" N, 075° 13' 44.3" W
Historical Depth: 12.27 m
Search Radius: 50
Search Technique: S2,MB,ES
Technique Notes: [None]

History Notes:
S00004/02 -- S-D602-RU-02 (HLS);
Survey Position: 039° 51' 33.310" N, 75° 13' 44.307" W
Least Depth: 12.27 m
Hydrographer Recommendations: chart sounding on obstr....PS Lund. 200% Side Scan Sonar coverage and SWMB was acquired over the item. The Hydrographer recommends charting the sounding on the obstruction.
UPDATED 9/27/2006 JCM

S-D903-NRT5, H12148--Hydrographer recommends removal of the OBSTN from chart. No feature found in imagery. (11/13/09, BSH)

Survey Summary

Charts Affected: 12313_2, 12312_1, 13003_1, 14500_1

Remarks:
Area was covered with 200% SSS. No obstruction found.

Feature Correlation

<table>
<thead>
<tr>
<th>Address</th>
<th>Feature</th>
<th>Range</th>
<th>Azimuth</th>
<th>Status</th>
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</thead>
<tbody>
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<td>AWOIS # 13807</td>
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<td>000.0</td>
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</tr>
</tbody>
</table>

Hydrographer Recommendations

Remove Obstrn and symbol from chart. Chart digital data.
S-57 Data

[None]

Office Notes

Concur.
1.4) AWOIS #13816 - AWOIS 13816 OBSTRUCTION

No Primary Survey Feature for this AWOIS Item

Search Position: 39° 53' 00.2" N, 075° 11' 30.6" W  
Historical Depth: 11.36 m  
Search Radius: 50  
Search Technique: S2, MB, ES  
Technique Notes: [None]

History Notes:
S00004/02 -- S-D602-RU-02 (HLS);
Survey Position: 039° 53' 00.238" N, 75° 11' 30.574" W
Least Depth: 11.36 m
Timestamp: 2002-170.00:20:16.121 (06/19/2002)
Hydrographer's recommendations: chart sounding on obstr....PS Lund
200% Side Scan Sonar coverage and SWMB was acquired over the item. The Hydrographer recommends charting
the sounding on the wreck with a least depth of 37 ft.
Office Notes: Do not concur. Charted 37 Rk and danger curve shown on Chart 12312, 54th., Ed., Jul/06. Do not
chart 37 Obstn.
UPDATED 9/27/2006 JCM

S-D903-NRT5-09, H12148--Hydrographer recommends remain as charted. (11/13/09, BSH)

Survey Summary

Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Area was covered with 200% SSS. Rock.

Feature Correlation

<table>
<thead>
<tr>
<th>Address</th>
<th>Feature</th>
<th>Range</th>
<th>Azimuth</th>
<th>Status</th>
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<td>AWOIS # 13816</td>
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</table>
Hydrographer Recommendations

Retain AWOIS 13816 (Rk) as charted.

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: QUASOU - 7: least depth unknown, safe clearance at value shown
           TECSOU - 2: found by side scan sonar
           VALSOU - 11.36 m
           VERDAT - 12: Mean lower low water
           WATLEV - 3: always under water/submerged

Office Notes

Concur. Retain rock as charted from ENC with least depth 36.7454 ft.
1.5) AWOIS #13862 - AWOIS 13862 OBSTRUCTION

No Primary Survey Feature for this AWOIS Item

Search Position: 39° 52' 50.8" N, 075° 11' 17.1" W
Historical Depth: 12.23 m
Search Radius: 50
Search Technique: S2,MB,ES
Technique Notes: [None]

History Notes:
S00004/02 -- S-D602-RU-02 (HLS);
Survey Position: 039° 52' 50.764" N, 75° 11' 17.083" W
Least Depth: 12.23 m
Timestamp: 2002-170.00:26:46.982 (06/19/2002)
Hydrographers Recommendations:200% Side Scan Sonar coverage and SWMB was acquired over the item. The Hydrographer recommends charting the sounding on the obstruction with a least depth of 40 ft. The Hydrographer further recommends this obstruction be submitted as a Danger To Navigation (DToN).
Office Notes: Do not concur Item not shown on Chart 11313, 51st., Ed., Mar/06. Defer to MCD Source Data Branch for charting disposition.
UPDATED 9/27/2006 JCM

S-D903-NRT5-09, H12148--REMOVE FROM AWOIS DATABASE. (11/13/09, BSH)

Survey Summary

Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
AWOIS 13862 found with 200% SSS and OD MBES. Rock.

Feature Correlation

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Hydrographer Recommendations

AWOIS 13862 validated by MBES and SSS. LD (40.53 ft) is deeper than channel controlling depth by 0.23 ft per chart tabulation (Eagle Point Range, Right Inside Quarter). E-mail with feature report on this item sent to Navigation Manager 03 Feb 2011 for USACE information only.

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes:
QUASOU - 6: least depth known
TECSOU - 2,3: found by side scan sonar, found by multi-beam
VALSOU - 12.23 m
VERDAT - 12: Mean lower low water
WATLEV - 3: always under water/submerged

Office Notes

Concur. No charting action required.
Feature Images

Figure 1.5.1
1.6) AWOIS #4704 - AWOIS 4704 OBSTRUCTION

No Primary Survey Feature for this AWOIS Item

Search Position: 39° 53' 36.0" N, 075° 07' 50.8" W
Historical Depth: [None]
Search Radius: 0
Search Technique: [None]
Technique Notes: [None]

History Notes:
AWOIS ITEM 4704

HISTORY
H9886/80--OPR-D218-HSB-80; AN UNCHARTED OBSTRUCTION WAS FOUND IN LAT 39-53-35.6N, LONG 75-07-52.2W; A SHARP SPIKE ON FATHOGRAM WAS NOT DEVELOPED BY HYDROGRAPHER AND WAS INTERPRETED AS AN OBSTRUCTION DURING VERIFICATION. (ENTERED MSM 6/87)

Survey Summary

Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Unable to survey area.

Feature Correlation

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<th>Azimuth</th>
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Hydrographer Recommendations

Retain as charted.

S-57 Data

[None]
Office Notes

Concur. Retain as charted.
1.7) AWOIS #4705 - AWOIS 4705 UNKNOWN

No Primary Survey Feature for this AWOIS Item

Search Position: 39° 54' 01.4" N, 075° 07' 37.0" W
Historical Depth: [None]
Search Radius: 0
Search Technique: [None]
Technique Notes: [None]

History Notes:
04705
HISTORY
H9886/80--OPR-D218-HSB-80; AN UNCHARTED VISIBLE WK WAS FOUND IN LAT 39-54-01.0N, LONG 75-07-38.4W; 30 X 80 FT STEEL BARGE (ENTERED MSM 6/87)
SURVEY REQUIREMENTS
NOT ASSIGNED

Survey Summary

Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Unable to survey area, location is on land.

Feature Correlation

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Hydrographer Recommendations

No action required.

S-57 Data

[None]
Office Notes

Wk not seen in survey data.

AWOIS Database info:

04705

HISTORY

H9886/80–OPR-D218-HSB-80; AN UNCHARTED VISIBLE WK WAS FOUND IN LAT 39-54-01.0N, LONG 75-07-38.4W; 30 X 80 FT STEEL BARGE (ENTERED MSM 6/87)

SURVEY REQUIREMENTS NOT ASSIGNED
1.8) AWOIS #4706 - AWOIS 4706 UNKNOWN

No Primary Survey Feature for this AWOIS Item

Search Position: 39° 55' 19.9" N, 075° 08' 14.2" W
Historical Depth: [None]
Search Radius: 0
Search Technique: [None]
Technique Notes: [None]

History Notes:
HISTORY
UNKNOWN SOURCE-- 1942 COE SURVEY; 3 SUBM DANG WKS AT LAT 39-55-20N, LONG 75-08-17.5W.
T87480/42--
H9886/80--OPR-D218-HSB-80; PSR ITEM 50; 3 WOODEN BARGES IN RUINS BARING 6-7FT WERE LOCATED AT LAT 39-55-20N, LONG 75-08-16W AND LAT 39-55-19.5N, LONG 75-08-15.6; AN ADDITIONAL STEEL BARGE IN RUINS BARING 7 FT IS LOCATED AT LAT 39-55-21.4N, LONG 75-08-15.1W; HYDROGRAPHER AND EVALUATOR RECOMMEND DELETING SUBM WKS AND ADDING VISIBLE WK ACCORDING TO SMOOTH SHEET; ALSO REF AWOIS ITEMS 4707 AND 4708 . (ENTERED MSM 6/87)

Survey Summary

Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Unable to survey area.

Feature Correlation

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<th>Address</th>
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<th>Azimuth</th>
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Hydrographer Recommendations

No action required - retain Wks as charted
S-57 Data

[None]

Office Notes

Concur. Retain wreck as charted.
1.9) AWOIS #4707 - AWOIS 4707 UNKNOWN

No Primary Survey Feature for this AWOIS Item

Search Position: 39° 55' 20.4" N, 075° 08' 14.6" W
Historical Depth: [None]
Search Radius: 0
Search Technique: [None]
Technique Notes: [None]

History Notes:
HISTORY
UNKNOWN SOURCE-- 1942 COE SURVEY; 3 SUBM DANG WKS AT LAT 39-55-20N, LONG 75-08-17.5W.
T8748C/42--
H9886/80--OPR-D218-HSB-80; PSR ITEM 50; 3 WOODEN BARGES IN RUINS BARING 6-7 FT WERE LOCATED AT LAT 39-55-20N, LONG 75-08-16W AND LAT 39-55-19.5N, LONG 75-08-15.6W; AN ADDITIONAL STEEL BARGE IN RUINS BARING 7 FT IS LOCATED AT LAT 39-55-21.4N, LONG 75-08-15.1W; HYDROGRAPHER AND EVALUATOR RECOMMEND DELETING SUBM WKS AND ADDING VISIBLE WK ACCORDING TO SMOOTH SHEET; ALSO REF AWOIS ITEMS 4706 AND 4708 . (ENTERED MSM 6/87)

Survey Summary

Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Unable to survey area.

Feature Correlation

<table>
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<tr>
<th>Address</th>
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Hydrographer Recommendations

No action required - retain Wks as charted
S-57 Data

[None]

Office Notes

Concur. Retain wreck as charted.
1.10) AWOIS #4708 - AWOIS 4708 UNKNOWN

No Primary Survey Feature for this AWOIS Item

Search Position: 39° 55' 21.8" N, 075° 08' 13.7" W
Historical Depth: [None]
Search Radius: 0
Search Technique: [None]
Technique Notes: [None]

History Notes:
HISTORY
UNKNOWN SOURCE-- 1942 COE SURVEY; 3 SUBM DANG WKS AT LAT 39-55-20N, LONG 75-08-17.5W.
T87580/42--
H9886/80--OPR-D218-HSB-80; PSR ITEM 50; 3 WOODEN BARGES IN RUINS BARING 6-7FT WERE LOCATED AT LAT 39-55-20N, LONG 75-08-16W AND LAT 39-55-19.5N, LONG 75-08-15.6W; AN ADDITIONAL STEEL BARGE IN RUINS BARING 7 FT IS LOCATED AT LAT 39-55-21.4N, LONG 75-08-15.1W; HYDROGRAPHER AND EVALUATOR RECOMMEND DELETING SUBM WKS AND ADDING VISIBLE WK ACCORDING TO SMOOTH SHEET; ALSO REF AWOIS ITEMS 4706 AND 4707. (ENTERED MSM 6/87)

Survey Summary

Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Unable to survey area.

Feature Correlation

<table>
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<tr>
<th>Address</th>
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<th>Range</th>
<th>Azimuth</th>
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<td>AWOIS #4708</td>
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<td>000.0</td>
<td>Primary</td>
</tr>
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</table>

Hydrographer Recommendations

No action required - retain Wks as charted
S-57 Data

[None]

Office Notes

Concur. Retain wreck as charted.
1.11) AWOIS #4709 - AWOIS 4709 UNKNOWN

No Primary Survey Feature for this AWOIS Item

Search Position: 39° 55' 34.9" N, 075° 07' 49.3" W
Historical Depth: [None]
Search Radius: 0
Search Technique: [None]
Technique Notes: [None]

History Notes:
04709
HISTORY
H9886/80--OPR-D218-HSB-80; AND UNCHARTED VISIBLE WK WAS FOUND IN LAT 39-55-34.5, LONG 75-07-50.7W; 30 X 120 FT WOODED BARGE BARING 5 FT. (ENTERED MSM 6/87)

SURVEY REQUIREMENTS
NOT ASSIGNED

Survey Summary

Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Unable to survey area.

Feature Correlation

<table>
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<tr>
<th>Address</th>
<th>Feature</th>
<th>Range</th>
<th>Azimuth</th>
<th>Status</th>
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Hydrographer Recommendations

No action required.

S-57 Data

[None]
Office Notes

Concur. Retain wreck as charted.
1.12) AWOIS #4437 - AWOIS 4437 UNKNOWN

No Primary Survey Feature for this AWOIS Item

Search Position: 39° 51' 06.4" N, 075° 13' 41.9" W
Historical Depth: [None]
Search Radius: 0
Search Technique: [None]
Technique Notes: [None]

History Notes:
04437
HISTORY
UNKNOWN SOURCE--SUNKEN WRECK CHARTED IN LAT 39-51-06N, LONG 75-13-43.2W.
H9942/81--OPR-D218-HSB-80; VISUAL INSPECTION AT LOW WATER AND UNCONTROLLED
FATHO SEARCH ALONG SHORELINE AT CHARTED POSITION; NON-DANG WK BARING AT LOW
WATER WAS OBSERVED BESIDE A DOCK; DUE TO LACK OF CONTROL IN AREA DETACHED
POSITION WAS NOT TAKEN; EVALUATOR RECOMMENDS CHARTING A STRANDED WK PA IN
CHARTED POSITION OF SUBM WK. (ENTERED MSM 4/86)
SURVEY REQUIREMENTS
NOT ASSIGNED

Survey Summary

Charts Affected: 12313_2, 12312_1, 13003_1, 14500_1

Remarks:
Unable to survey area.

Feature Correlation

<table>
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<tr>
<th>Address</th>
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<th>Range</th>
<th>Azimuth</th>
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<td>AWOIS # 4437</td>
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</table>

Hydrographer Recommendations

No action required.
S-57 Data

[None]

Office Notes

Concur. Retain wreck as charted.
1.13) AWOIS #13861 - AWOIS 13861 - OBSTRUCTION

No Primary Survey Feature for this AWOIS Item

Search Position: 39° 52' 13.4" N, 075° 12' 56.0" W
Historical Depth: 11.34 m
Search Radius: 50
Search Technique: S2,MB,ES
Technique Notes: [None]

History Notes:
S00004/02 -- S-D602-RU-02 (HLS);
Survey Position: 039° 52' 13.371" N, 75° 12' 55.986" W
Least Depth: 11.34 m
Timestamp: 2002-170.00:10:11.516 (06/19/2002)
Hydrographer Recommendations: chart DToN....PS Lund

200% Side Scan Sonar coverage and SWMB was acquired over the item. The Hydrographer recommends charting the sounding on the obstruction with a least depth of 37 ft. The Hydrographer further recommends this obstruction be submitted as a Danger To Navigation (DToN).
Office Notes: Concur. Chart 37 Obstn and danger curve.
UPDATED 9/27/2006 JCM

S-D903-NRT5-09, H12148-- Hydrographer recommends remain as charted. (11/13/09, BSH)

Survey Summary

Charts Affected: 12313_1, 12313_2, 12312_1, 13003_1, 14500_1

Remarks:
Area was covered with 200% SSS. No feature found in imagery.

Feature Correlation

<table>
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<th>Feature</th>
<th>Range</th>
<th>Azimuth</th>
<th>Status</th>
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<td>AWOIS # 13861</td>
<td>0.00</td>
<td>000.0</td>
<td>Primary</td>
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</table>
Hydrographer Recommendations

Remove Obstn and symbol from chart. Chart digital data.

S-57 Data

[None]

Office Notes

Concur. Remove obstruction symbol from chart.
1.14) AWOIS #14658 - AWOIS 14658 UNKNOWN

No Primary Survey Feature for this AWOIS Item

Search Position: 39° 51' 43.4" N, 075° 12' 21.3" W
Historical Depth: [None]
Search Radius: 0
Search Technique: [None]
Technique Notes: [None]

History Notes:
OPR-D218-HSB-80, H-9942; Vis Wrks, 2 steel barges, approx. 20ft x 150ft. (Entered 8/11/09 KAK)

Survey Summary

Charts Affected: 12313_1, 12312_1, 13003_1, 14500_1

Remarks:
Unable to survey area.

Feature Correlation

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<th>Azimuth</th>
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Hydrographer Recommendations

No action required - retain Wk symbol as charted.

S-57 Data

[None]

Office Notes

Concur. Retain wreck as charted.
APPENDIX III

PROGRESS SKETCH
APPENDIX IV

TIDES AND WATER LEVELS
DATE: December 29, 2009

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: S-D903-NRT5-2009
HYDROGRAPHIC SHEET: H12148

LOCALITY: Delaware River, Philadelphia, PA
TIME PERIOD: September 22 - December 9, 2009

TIDE STATION USED: Tacony-Palmyra Bridge, NJ 853-8886
Lat. 40° 0.7' N  Long. 75° 2.6' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.028 meters

TIDE STATION USED: Marcus Hook, PA 854-0433
Lat. 39° 48.7' N  Long. 75° 24.6' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.720 meters

TIDE STATION USED: Philadelphia, PA 854-5240
Lat. 39° 56.0' N  Long. 75° 8.5' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.887 meters

TIDE STATION USED: Reedy Point, DE 855-1910
Lat. 39° 33.5' N  Long. 75° 34.4' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.683 meters

REMARKS: RECOMMENDED Grid
Please use the TCARI grid "D903NRT52009Final" as the final grid for project S-D903-NRT5-2009, H12148, during the time period between September 22 - December 9, 2010.

Refer to attachments for grid information.

Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

Note 2:
APPENDIX V
SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCES

V.1. COAST PILOT REPORT, NOAA FORM 77-6

No corrections or additions required. Concur.

V.2. BOTTOM SAMPLE, NOAA FORM 75-44

No bottom samples were taken. Concur.

V.3. AIDS TO NAVIGATION, NOAA FORM 76-40

The hydrographer recommends no modifications to any aids to navigation to note. All were verified as accurate. Concur.
Sarah,

My name is John Kidd. I am an ERT intern at AHB. I am compiling survey H12148 on the Delaware River conducted by NRT-5. I am currently half way through compilation process but I wanted to pass along some information about shoal soundings in federally maintained channels. There has been some discussion between USACE and the field about shoal soundings found in the vicinity of the Walt Whitman Bridge. The communication resulted in revising the authorized minimum depth on the ENC. The ENC has channel tabulations dated June 2009 and the RNC has channel tabulations dated October 2010 and they of course do not agree. During my compilation, I found 5 soundings that were shoaler than the ENC tabulated depths. I would just like to pass this information along to you so you can take the appropriate action with USACE (if any action is indeed necessary). I attached a file containing the lat/long and depth of each shoal sounding as well as a .pdf that has some images of the channels with the shoal soundings highlighted in red. Please let me know if AHB should chart any of these shoal soundings in the channels. Please do not hesitate to call me, although reaching me might be difficult. Our offices were recently upgraded and the phone system is not yet installed properly.

Thank you,

John Kidd
757 441 6746

Latitude,Longitude,Depth
39-54-13.14612N,075-07-57.25092W,42.4967
39-53-46.40352N,075-08-10.50648W,38.8123
39-53-46.79304N,075-08-10.50720W,38.5860
39-54-12.88584N,075-07-57.92412W,42.9265
39-54-12.49632N,075-07-58.09188W,42.7559

Sara wrote:

John,
Thank you for the information. I am forwarding this email to Howard Danley who handles this area of the country and USACE.

v/r,
Sarah
Gene/Ed,

Do you know to what extent the new BH survey junctioned with survey H12148? Is F00594 the survey that BH conducted that supersedes H12147? I seem to remember the BH doing work under the Walt Witman bridge during this survey. I am going to send this to Howard to get our communication with the COE in Philli started, but we probably need to understand this going forward. Perhaps John can pull up this data if he hasn't already.

Rick

-------- Original Message --------
Subject: Survey H12148- Shoal Soundings in USACE Channel
    Date: Mon, 07 Mar 2011 14:23:56 -0500
    From: John Kidd <John.Kidd@noaa.gov>
    To: Sarah.Mrozek@noaa.gov, Richard.T.Brennan@noaa.gov

Howard,

Do you have a contact with the Philadelphia COE district that we could talk to about recent dredging and survey work? We are finding areas from recent NRT surveys where our soundings violate the project depth of their channel.

Rick

-------- Original Message --------
Subject: Survey H12148- Shoal Soundings in USACE Channel
    Date: Mon, 07 Mar 2011 14:23:56 -0500
    From: John Kidd <John.Kidd@noaa.gov>
    To: Sarah.Mrozek@noaa.gov, Richard.T.Brennan@noaa.gov

Hi Rick,

I asked for a check of the soundings below against what we have in Silver Spring re USACE surveys before forwarding to USACE. Have not received results of our check. Like to give as complete a package as possible to Corps as we can.

I recently forwarded some other sounding questions Chris Van W had. re NRT surveys.

Do we have a feel if we will have more? They would probably like them all at once. I am in Philadelphia today for Mariners' Advisory meeting and will tell my contact we will be contacting them.
I will be back in office tomorrow and check status of search on soundings below and be in touch with you.

Thanks for all the work you guys do.

Howard

----- Original Message ----- 
From: "CDR Rick Brennan, NOAA" <Richard.T.Brennan@noaa.gov>
Date: Wednesday, March 9, 2011 3:43 pm
Subject: Fwd: Survey H12148- Shoal Soundings in USACE Channel
To: "'howard.danley@noaa.gov'" <Howard.Danley@noaa.gov>
Cc: Edward Owens <Edward.Owens@noaa.gov>, Rosemary Abbitt <Rosemary.Abbitt@noaa.gov>, John Kidd <John.Kidd@noaa.gov>

Howard,

Yes, we have four more surveys in our queue. Three more NRT and one BH. Most of the time these issues don't come to the fore until they get into compilation. If needed we can try to do a quick review again the channel tabs and see if there are others. Or, if there is an online location for Philli where we can pull their most recent post-dredge surveys then we could serve ourselves.

Rick

John,

Thanks for you email. I've been investigating the soundings you provided in your email, but I haven't been able to locate any tabulated depths in that area dated later than 2009. You mentioned tabulated depths from 2010, but those appear to only be only for Harbor Range,Fisher Channel, and beyond. All these reaches are well north of the sounding locations you provided.

In looking over the 2009 Corps tabulation data, these soundings actually appear to agree fairly well, or even be deeper than currently charted tabulated depths. All 5 soundings you provided chart within the
East Horseshoe Range and Reach M Section. (See attached screen captures). The Latest Corps Data indicates:

LOQ: 39.8
LIQ: 43.1
RIQ: 44.5
ROQ: 42.5

At any rate, I tried to call, but don't know your extension and you're not yet listed in the directory. Feel free to call me at 301-713-2730 ext. 174 to discuss - I want to make sure I'm not missing something here. Ok, thanks again,
Steve

Steve,

I have looked back over the data and still am coming up with sholar soundings in the USACE channel. The two soundings found near Windy Pt of 38.823 ft and 38.5860 ft are shoaler than the tabulated depth for East Horseshoe Range and Reach M Section LOC of 39.8 ft. Also, the 3 other soundings found 230 m south of the Walt Whitman Fixed Bridge of 42.4967 ft, 42.7559 ft, and 42.9265 ft are shoaler than the tabulated depth for East Horseshoe Range and Reach M Section LIC of 33.1 ft.
I apologize for the October 2010 survey date confusion. Yes the tabulated depths in that area are dated June of 09'.

Thanks for helping us out with this,
John Kidd
All, The object in question appears on our latest 31 Jan 2011 survey. Our
surveys show 41.1 and 41.9 at this spot. There are a number of isolated
shoaling spots on the widener and all are accounted for on the channel
statement. The attached is a screen capture on the object reference to our
last survey. All the isolated shoals on this range seem to be durable and
constant. There will be no further action taken regarding this subject.

Tim Rooney
Project Manager
US Army Corps of Engineers

-----Original Message-----
From: DePasquale, Anthony J NAP
Sent: Saturday, February 05, 2011 9:58 PM
To: 'Howard.Danley@noaa.gov'; 'mac.chair@comcast.net';
'jimroche@delpilots.com'; Rooney, Timothy J NAP; Landis, Michael A NAP;
Shamberger, Greg H NAP
Cc: 'John.R.Walters@uscg.mil'; 'Christiaan.VanWestendorp@noaa.gov'
Subject: Re: 40ft feature in Delaware River

Just saw email. We will survey area of concern on Monday and let you know
course of action. Thanks

----- Original Message -----
From: Howard Danley <Howard.Danley@noaa.gov>
To: Roberts, Stephen <mac.chair@comcast.net>; Roche <jimroche@delpilots.com>
Rooney, Timothy J NAP; DePasquale, Anthony J NAP
Cc: John, Walters, <John.R.Walters@uscg.mil>; Christiaan VanWestendorp
<Christiaan.VanWestendorp@noaa.gov>
Sent: Fri Feb 04 13:27:06 2011
Subject: FW: 40ft feature in Delaware River

Hi Tim and Tony,

See email below and attached for feature in Eagle Point range. This feature
was noted during QA of a recent NOAA survey. NOAA policy is to notify USACE
of any features found below project depth in Federal channels. Please let
me know of any USACE actions taken.
V/R,
Howard

-----Original Message-----
From: Chris van Westendorp [mailto:Christiaan.VanWestendorp@noaa.gov]
Sent: Thursday, February 03, 2011 6:10 PM
To: Howard Danley
Cc: Castle Parker
Subject: 40ft feature in Delaware River

Hi, Howard,

Just wanted to pass this to you for USACE information purposes. A 40.53 ft
feature (likely a rock) is in the Eagle Point Range of the Delaware River
and is close to (but deeper than) the channel controlling depth.
Please let me know if you and/or USACE have any questions.

V/R,
Chris van Westendorp
LCDR, NOAA

Classification: UNCLASSIFIED
Caveats: NONE

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</table>
Hi, Howard,

Just wanted to pass this to you for USACE information purposes. A 40.53 ft feature (likely a rock) is in the Eagle Point Range of the Delaware River and is close to (but deeper than) the channel controlling depth. Please let me know if you and/or USACE have any questions.

V/R,
Chris van Westendorp
LCDR, NOAA
This has the string. Joe Scolari was their survey chief then. Retired about a year ago

-----Original Message-----
From: Howard Danley [mailto:Howard.Danley@noaa.gov]
Sent: Friday, November 13, 2009 11:28 AM
To: Scolari, Joseph V NAP
Cc: Groch, John A NAP
Subject: Re: [Fwd: Re: DTON, S-D903-NRT5-09, H12148, Philadelphia]

Thanks Joe. Would you let know your disposition of this item. Thanks--
Howard

Scolari, Joseph V NAP wrote:

Howard, We know of some edge shoals in the area. We will review your
information to see if it is one of the known or a new issue. I am the correct
person to route these items to.

Joseph V. Scolari 3rd
Chief of Survey
Philadelphia District
US Army Corps of Engineers

Office Phone 215-656-6754
Cell Phone 609-374-0263

-----Original Message-----
From: Howard Danley [mailto:Howard.Danley@noaa.gov]
Sent: Friday, November 13, 2009 11:07 AM
To: Scolari, Joseph V NAP
Subject: [Fwd: Re: DTON, S-D903-NRT5-09, H12148, Philadelphia]

Joe,

Our field unit found a shoal area (28 feet) in the edge of the channel
as shown on the attached file. Is this something you know about/
Should I report it someone else? Imagery forwarded separately.

Howard

-------- Original Message --------
Subject:  Re: DTON, S-D903-NRT5-09, H12148, Philadelphia
Date:  Tue, 10 Nov 2009 15:09:42 -0500
From:  Bert <Bert.Ho@noaa.gov>
To:  Howard Danley <Howard.Danley@noaa.gov>
References:  <4AF97BE5.90002@noaa.gov> <4AF97D5B.7040502@noaa.gov>
<4AF97EA8.9030703@noaa.gov> <4AF981FC.1090002@noaa.gov>
<4AF9859C.3090209@noaa.gov> <4AF9C42A.6040507@noaa.gov>

here's the plot of the DTON, its just north of the Walt Whitman Bridge.
the plots will take a couple days.

Howard Danley wrote:

Bert,

Can you give me a chart section with the DTON plotted? Also, can you
give me preliminary plots of the areas the pilots designated as
potential anchorages.

Thanks
Howard

Bert wrote:

Hi Howard,

Regarding the survey in the Delaware River, we did not survey within the Federal channel on purpose. However, on these sheets, we had to run a side scan line on the outer edges of the channel to cover the areas inshore of the channel and along the river bank. Because of the width of our swath and the fact that it extends to both sides, we obviously covered areas that were within the Federal channels. If a contact is found within our SSS data, regardless of where it is, we developed it with our multibeam. In this case, the contact fell within the channel and we gathered bathy data over it.

I'm just letting you know this in case the USACE questions why we were surveying in their channel. It was not our intention to do so, its just an inevitable aspect of how our survey is run when surveying outside of their channel.

Ok, thanks Howard.

-Bert

j
Chris,

Did not forget about you searched emails yesterday and today. Have some other traffic I will forward as well.

Howard

-----Original Message-----
From: Howard Danley [mailto:Howard.Danley@noaa.gov]
Sent: Thursday, November 19, 2009 10:28 AM
To: ocs.ndb; Steve Soherr
Cc: Bert; James M Crocker; Richard T Brennan; Lawrence T Krepp; Matthew Jaskoski; Tara Wallace; Chris Libeau; Doug Baird; Ed Martin; Diane Melancon
Subject: Re: DTON, S-D903-NRT5-09, H12148, Philadelphia

Hi,

I checked with USACE Philadelphia. They are aware of shoaling in this vicinity. Area was surveyed by them in June and a shoal depth is reflected in the chart tabulation.

Howard

ocs.ndb wrote:

Bert,

Due to this feature's location within a federal channel, NDB recommends that this information be submitted to the appropriate OCS NavManager for follow-up with the USACE, USCG and other stakeholders. We will not forward this source to the production teams at this time.

All,

If anyone has any feedback regarding this issue, please contact NDB.

Regards,

Lance Roddy
Cartographer
Nautical Data Branch

Bert wrote:

To MCD,

This is a DTON report that is part of Project S-D903-NRT5-09, H12148, Delaware River, Philadelphia, PA. The DTON is within the federal channel in the vicinity of the Walt Whitman Bridge.

-Bert Ho
NOAA NRT5 Northeast
718-702-8974
Subject: Anch areas
From: Howard Danley <Howard.Danley@noaa.gov>
Date: Tue, 10 Nov 2009 14:58:14 -0500
To: Bert Ho <Bert.Ho@noaa.gov>

See the graphics below

-------- Original Message --------
Date:     Mon, 08 Jun 2009 10:12:59 -0400
From:     Stephen Roberts <s.a.roberts@comcast.net>
To:     Howard.Danley@noaa.gov

Howard,

It was good to see you the other day at the Mariner’s Advisory Committee meeting in Philadelphia. We really appreciate NOAA’s and your support for our area. With the resignation of Tom Sharp as Chairman, I was appointed to the position by Capt. Jim Roche. It should be announced sometime this week.

Thank you for your offer of tasking some out of channel surveying in our area. I have attached some images of charts with areas outlined in blue that we are interested in for the creation of new anchorages. We are also interested in a couple of areas to create emergency turning basins off of Tioga Marine Terminal and below the Tacony-Palmyra Bridge.

I look forward to a long and fruitful relationship with all of our friends at NOAA. Please feel free to contact me with any questions or if there is anything we can do for you.

Best regards,

Steve Roberts
Anch areas

Please survey areas East of Bellevue and Marcus Hook Ranges, South of Anchorage #7.

DI have been observed astride the Delaware River Channel from Oldmans Point to the mouth of Oldmans Creek.
Anch areas

Please survey waters in and around Anchorage #5.

Please Survey area around Anchorage #10.
Anch areas

Please survey area to the West of New Castle and Cherry Island Range intersection.
Anch areas

Please survey areas near Petty Island.

Please survey for emergency turning basin.
Anch areas

Please survey area South of Tinicum and North of Billingsport Ranges.

Please survey area North of Anchorage #6.
General Survey Information

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<tr>
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Source Grids

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Export HOBs

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**SPECIFICATIONS:**

I. **COMBINED SURFACE:**
   a. Number of SAR Final Grids: 2
   b. Resolution of Combined (m): 4 m

II. **SURVEY SCALE SOUNDINGS (SS):**
   a. Attribute Name: Depth
   b. Selection criteria: Radius, Shoal bias
   c. Radius value is:
      i. Use single-defined radius: NA
      ii. And/Or use radius table file: H12148_SS_SSR_15K.txt

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d. Queried Depth of All Soundings
   i. Minimum: 3.5925 ft
   ii. Maximum: 63.8123 ft

III. **INTERPOLATED TIN SURFACE:**
   a. Resolution (m): 12 m
   b. Interpolation method: Natural Neighbor
   c. Shift value: -0.75 ft

IV. **CONTOURS:**
   a. Attribute Name: Depth
   b. Use a Depth List: H12148_depth_contours.txt
   c. Output Options: Create contour lines
      i. Line Object: DEPCNT
      ii. Value Attribute: VALDCO

V. **FEATURES:**
   a. Number of Chart Features: 8
   b. Number of Non-Chart Features: 4
VI. **Chart Survey Soundings (CS):**
   a. Number of ENC CS Soundings: 445
   b. Attribute Name: Depth
   c. Selection criteria: Radius, Shoal bias
   d. Radius value is:
      i. Use single-defined radius: NA
      ii. And/Or use radius table file: H12148_CS_SSR_15k.txt
         0  1.8288  70
         1.8288 1 3.6576  80
         3.6576 1 5.4864  90
         5.4864 9.1440  95
         9.1440 18.288  100
   iii. Enable Filter: Interpolated !=1
   e. Number Survey CS Soundings: 399

VII. **Notes:**
This H-Cell Report has been written to supplement and/or clarify the original Descriptive Report (DR) and pass critical compilation information to the cartographers in the Marine Chart Division. Sections in this report refer to the corresponding sections of the Descriptive Report.

B. DATA ACQUISITION AND PROCESSING

B.2 QUALITY CONTROL

The AHB source depth grids for the survey’s nautical chart update were 0.5 m and 4m resolution BASE surfaces (*.CSAR), which were combined at 4m resolution. The survey scale soundings were created from the combined surface using a sounding spacing range (SSR) file. A TIN was created from the survey scale soundings, from which an interpolated surface of 12m resolution was generated. The chart scale soundings were selected from the filtered interpolated surface using a sounding spacing range (SSR) file. The chart scale soundings are a subset of the survey scale soundings. The surface model was referenced when selecting the chart scale soundings, to ensure that the selected soundings portray the bathymetry within the common area.

The interpolated TIN surface of 12m resolution was shifted by the NOAA sounding rounding value of -0.75 feet. The shifted interpolated TIN was used to generate depth contours in feet (6ft, 12ft, 18ft, and 30ft). The depth contours are forwarded to MCD for reference only. The contours were utilized during chart scale sounding selection and quality assurance efforts at AHB. The depth contours are incorporated into the SS H-Cell product as per 2009 H-Cell Specifications.

The compilation products (Final *.HOB files) for this survey are detailed in the H12148 AHB Compilation Log contained within this document. The Final HOB files include depth areas (DEPARE), depth contours (DEPCNT), soundings (SOUNDG), meta-objects (M_COVR, M_QUAL), cartographic Blue Notes ($CSYMB, and $AREAS), and features (OBSTRN, UWTROC, SBDARE).

As dictated by Hydrographic Technical Directive 2008-8, the Final HOB files were combined into two separate H-Cell files in S-57 format. Both S-57 files were exported from CARIS Bathy DataBase in meters, and then converted from metric units into feet using CARIS HOM ENC 3.3. Quality assurance and topology checks were conducted using CARIS S-57 Composer 2.2 and DKART Inspector 5.1 validation tests.

The final H-Cell products are two S-57 files, in Lat/Long NAD-83. The contents of these two H-Cell deliverables are listed in the table below:
### TABLE 1 - Contents of H-Cell Files

<table>
<thead>
<tr>
<th>H12148_CS.000</th>
<th>Scale 1:15,000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Object Class Types</strong></td>
<td><strong>Geographic</strong></td>
</tr>
<tr>
<td><strong>S-57 Object Acronyms</strong></td>
<td>DEPARE</td>
</tr>
<tr>
<td></td>
<td>OBSTRN</td>
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<tr>
<td></td>
<td>SBDARE</td>
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<tr>
<td></td>
<td>SOUNDG</td>
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<td></td>
<td>UWTROC</td>
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<table>
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<th>H12148_SS.000</th>
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</tr>
</thead>
<tbody>
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<td><strong>Geographic</strong></td>
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<tr>
<td><strong>S-57 Object Acronyms</strong></td>
<td>DEPCNT</td>
</tr>
<tr>
<td></td>
<td>SOUNDG</td>
</tr>
</tbody>
</table>

### B.2.4 Junctions and Prior Surveys

Survey H12148 (2009) junctions with survey H12149 (2009) to the south, H12147 (2009), and F00594 (2010) to the north. Most present survey depths compare within 1 foot of both junctioning survey depths to the north, and within 1 foot of junctioning survey depths to the south.

### B.2.5 Single Beam Quality Control

On one line of SSS/VBES data collection (2009-267 / 007_1334), the VBES appears to have ceased recording data after approximately the first 1200m of acquisition. Thus, a VBES coverage gap (approximately 4500m long, 120m wide) exists in the northern section of the survey area.

### B.4 DATA PROCESSING

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

- CARIS Bathy DataBASE version 2.3/Build 264/HF16
- CARIS Bathy DataBASE version 3.0/HF10
- CARIS HIPS and SIPS version 6.1/SP2/HF5
- CARIS S-57 Composer version 2.2/HF3
- CARIS HOM ENC version 3.3/SP3/HF8
- DKART Inspector version 5.1
- HSTP Pydro version 10.11 (r3191)
C. **HORIZONTAL AND VERTICAL CONTROL**

The hydrographer makes adequate mention of horizontal and vertical control used for this survey in section C of the DR. The sounding datum for this survey is Mean Lower Low Water (MLLW), and the vertical datum is Mean High Water (MHW). Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD83), UTM projection zone 18 North.

D. **RESULTS AND RECOMMENDATIONS**

**D.1 CHART COMPARISON**

<table>
<thead>
<tr>
<th>Chart</th>
<th>Edition</th>
<th>Description</th>
<th>Dates</th>
<th>Scale</th>
</tr>
</thead>
</table>

**ENC COMPARISON**

<table>
<thead>
<tr>
<th>ENC</th>
<th>Description</th>
<th>Edition</th>
<th>Dates</th>
<th>Issue Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>US5PA12M</td>
<td>Philadelphia and Camden Waterfronts</td>
<td>Edition 21</td>
<td>Application Date 2010/03/16, Issue Date 2010/09/21</td>
<td>Chart 12313</td>
</tr>
</tbody>
</table>

**D.1.3 Dangers to Navigation**

The USACE both acknowledges the shoal and has addressed it on the chart by reducing the tabulated depth (22.6 ft for Left Outside Quarter from Reach M to Benjamin Franklin Bridge, Chart 12313). See Correspondence in Appendix 5 (“SAR DtoN Correspondence with Nav Mgr 1.pdf” and “SAR DtoN Correspondence with Nav Mgr 2.pdf”) This shoal should not be compiled / added to the H-Cell product.

**D.1.5 Charting Recommendations**

Survey H12148 is sufficient to supersede charted soundings in the common areas with the exception of the area mentioned in B.2.5.
D.2 ADDITIONAL RESULTS

The charted hydrography originates with prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in section D and Appendix I and II of the DR. The hydrographer recommends that any charted features not specifically addressed either in the H-Cell files or the Blue Notes should be retained as charted. The following exceptions are noted:

a. Contemporary survey F00594 conducted by the Bay Hydrographer II serves to supersede all data that it overlaps with H12148. F00594 is currently in Atlantic Hydrographic Branch’s compilation queue. The coverage area for H12148 has been cut to the extent of F00594 multibeam grid. Therefore, no data north of this was compiled with exception to one feature addressed below.
b. A feature was found on the eastern shoreline approximately 700 meters north of the most northern point of the DEPARE of H12148. This 10ft obstruction was compiled in this survey due to lack of multibeam coverage on the obstruction by contemporary survey F00594 conducted by the Bay Hydrographer II.
c. All ENC and RNC tabulated controlling depths for USACE channels do not agree with each other.

d. Throughout the H12148 survey area, numerous charted soundings from ENC US5PA12M were retained as charted due to three conditions which are discussed below. Within the M_COVR “coverage” area 93 CS soundings originate from ENC US5PA12M and 299 CS soundings originate from the survey H12148 SS sounding data set. The M_COVR coverage was also reduced “pulled back” in areas where charted soundings required retaining.

Survey H12148 was conducted as a vertical beam (VB) and side scan sonar (SSS) survey with multibeam (MB) developments.

Office processing determined:
1) Object detection quality of the SSS data was less than adequate in some areas, especially where the topography of the river bed was highly dynamic. Without bathy development in these areas, shoal charted soundings were not adequately disproved.
2) In many areas, the survey line spacing of the vertical beam data was insufficient to adequately disprove shoaler charted soundings between survey lines, again in areas of dynamic river bed topography.
3) In this area of the Delaware River, survey H12148 should have been conducted as a 100% multibeam survey in order to supersede all charted bathymetry, especially since much of the charted data is sourced from 100% multibeam surveys conducted by NOAA.
ship Rude in ~2002. Also noteworthy, survey H12147, also acquired as part of the S-D903-NRT5-09 project, junctioning to the North was rejected due to poor data quality and execution. The H12147 and a portion of the H12148 survey areas had to be reacquired as survey F00594 by NOAA Vessel Bay Hydrographer II in 2010.

The following images illustrate some of the areas where charted soundings from the ENC were retained.

Red Soundings = H12148 survey soundings
Blue soundings = Charted soundings retained
D.6 MISCELLANEOUS

Chart compilation was completed by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compilation data will be forwarded to the Marine Chart Division in Silver Spring, Maryland. See section D.1 of this report for a list of the Raster Charts and Electronic Navigation Charts (ENC) used for compiling the present survey.

D.7 ADEQUACY OF SURVEY

The present survey is adequate to supersede the charted bathymetry within the common area. Any features not specifically addressed either in the H-Cell files or the Blue Notes should be retained as charted. Refer to section D and Appendix I and II of the DR for further recommendations by the hydrographer.
Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth contours, disposition of critical depths, cartographic symbolization, and verification or disproval of charted data. All revisions and additions made to the H-Cell files during survey processing have been entered in the digital data for this survey. The survey records and digital data comply with National Ocean Service and Office of Coast Survey requirements except where noted in the Descriptive Report and the H-Cell Report.

All final products have undergone a comprehensive review per the Hydrographic Surveys Division Office Processing Manual and are verified to be accurate and complete except where noted.

John Kidd
Hydrographic Intern
Atlantic Hydrographic Branch

I have reviewed the H-Cell files, accompanying data, and reports. This survey and accompanying Marine Chart Division deliverables meet National Ocean Service requirements and standards for products in support of nautical charting except where noted.

Approved: ________________________________

For: CDR Richard T. Brennan, NOAA
Chief, Atlantic Hydrographic Branch