

H10934

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic / Side Scan Sonar

Field No. BH-10-3-99

Registry No. H10934

LOCALITY

State Maryland

General Locality Chesapeake Bay

Locality 2NM South of Point Lookout

1999-2000

CHIEF OF PARTY
LT. Shepard Smith

LIBRARY & ARCHIVES

DATE

DEC 13 2000

HYDROGRAPHIC TITLE SHEET

H10934

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

FIELD NO.

BH-10-3-99

State Maryland

General locality Chesapeake Bay

Locality 2NM South of Pt. Lookout, MD

Scale 1:10,000

Date of survey 9-31-99 to 6-12-2000

Instructions dated 3-26-99

Project No. OPR-E346-BH

Vessel NOAA Survey Vessel BAY HYDROGRAPHER

Chief of party LT Shepard Smith

Surveyed by LT Shepard Smith, ST Michael Becker

Soundings taken by echo sounder, hand lead, pole Odom Echotrac MKII

Graphic record scaled by LT Shepard Smith, Michael Becker

Graphic record checked by LT Shepard Smith, Michael Becker

Protracted by N/A

Automated plot by HP 750C

Verification by Atlantic Hydrographic Branch Personnel

Soundings in meters feet at MLW MLLW (Meters at MLLW)

REMARKS: All times are recorded in UTC. Handwritten notes in the Descriptive Report were made during verification.

AWOIS/SURF ✓ 7/12/00 SJV

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DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY

OPR-E346-AHP

BH AHP-10-3-99

H10934

NOAA S/V BAY HYDROGRAPHER
LT SHEPARD SMITH, OFFICER IN CHARGE

A. PROJECT

A.1 This basic hydrographic survey was conducted in accordance with Hydrographic Project Instructions OPR-E346-BH, Lower Chesapeake Bay - Calendar Year 1999 and 2000 operations.

A.2 The original instructions are dated March 26, 1999.

A.3 There have been no changes to the original instructions.

A.4 This Descriptive Report covers sheet "B" of OPR-E346-BH. This sheet lies within the corridor at the mouth of the Potomac River, Maryland. This hydrographic survey covers Smith Point to Point Lookout. See section B.2 for exact survey boundaries.

A.5 Project OPR-E346-BH, sheet "B" specifically assesses a request from the Association of Maryland Pilots for navigable limits for bottom clearances of the vessels calling on the oil terminal at Piney Point, Maryland.

B. AREA SURVEYED

B.1 This survey covers the mouth of the channel from Smith Point to Pt. Lookout, Maryland.

B.2 This sheet has the following boundaries, starting at the Southeast corner and progressing clockwise (Fig. B1):

1. 37° 55' 41" N 076° 15' 01" W
2. 37° 58' 56" N 076° 21' 59" W
3. 38° 02' 18" N 076° 19' 32" W
4. 38° 01' 58" N 076° 19' 20" W
5. 38° 02' 17" N 076° 19' 08" W

6.38°02'11"N 076°18'42"W
7.37°59'21"N 076° 12'21"W

B.3 Data collection for this survey began on September 31, 1999(DN 274) and ended on June 12, 2000(DN 164).

C. SURVEY VESSELS

C.1 The following vessel was used during this survey:

<u>Vessel</u>	<u>EDP Number</u>	<u>Primary Function</u>
NOAA Survey Vessel BAY HYDROGRAPHER	1107	Hydrography. Side Scan, and Multibeam Operations

C.2 No unusual vessel configurations were used during this survey.

D. AUTOMATED DATA ACQUISITION AND PROCESSING SEE ALSO THE EVALUATION REPORT

D.1 All sounding data acquisition software and data processing software versions are found on the Hydrosoft CD, version 9.4. HYPACK software was used exclusively for data acquisition; no processing modules were used.

D.2 The SEABIRD SBE-19 sound velocity profile unit was utilized with SEASOFT 3.3M and SEACAT 3.1 software. The program VELOCITY 4.0 for Windows was used to process the collected data and calculate velocity corrections.

D.3 Edits of vertical beam sounding data was accomplished using HPS. Post processing and final correctors of vertical beam sounding data was accomplished using HDCS and MapInfo applications.

D.4 Isis Version 4.55 was used for digital side scan sonar and multibeam acquisition. The digital data was logged as XTF files (Extended Triton Format).

D.5 CARIS SIPS (Sonar Image Processing System) was used to process the digital side scan sonar data. SIPS was used to check bottom track quality, towfish navigation, slant-range correct the image, pick contacts, measure contact heights, and create mosaics.

D.5a. CARIS HIPS (Hydrographic Image Processing System) was used to process the multibeam sonar data. HIPS was used to clean multibeam sounding data, check navigation, heave, pitch and roll values, and create work files. All multibeam data was exported into MapInfo, for use with the correlator and directly into the Caris file at 5m bin.

D.6 No software problems were encountered in acquisition or processing, which would affect the survey data.

E. SIDE SCAN SONAR EQUIPMENT.

E.1 The BAY HYDROGRAPHER conducted side scan sonar operations on Day Numbers 328, 333, 336, 349, 351, 354, 355, 006, 007, 024, 045, 047, 048, 060, 062, 067, 068, 069, 070, and 073 using a Klein system 5500 sonar (S/N 101). This integrated system includes the high resolution, multiple beam side scan sonar towfish, and the T5100 Sonar Transceiver module (for output of sonar data and trigger). The Klein 5000 towfish is configured with a 40° beam depression at 455 KHz frequency.

The BAY HYDROGRAPHER conducted side scan sonar operations on Day Numbers 105, 111, 124, 129, 152, 153, 154, and 158 using an EG&G Model 272 Tow Fish and Model 260 recorder sonar. This system incorporates a patented time varied gain (TVG) circuit, which compensates for the known signal losses versus range.

E.2 Forty meter line spacing with the 50 meter range scale and 60 meter line spacing with the 75 meter range scale was used throughout this survey. This range scale was used to obtain complete area coverage and provide optimal contact resolution.

E.3 Side scan sonar operations using Klein 5000 were limited to a speed-over-ground of 10 knots. Side scan sonar operations using EG&G Model 272 were limited to a speed-over-ground of 5 knots. Confidence checks were performed by noting changes in linear bottom features extending to the outer edges of the digital side scan image, and by passing aids to navigation. These features were identified during post-processing in CARIS SIPS.

E.4 a. Two hundred percent side scan sonar coverage was completed for this survey. Side scan sonar coverage was

checked using MapInfo generated swath "A" and "B" plots to ensure proper overlap between adjoining lines. Side scan sonar coverage was also determined by using mosaics generated in SIPS and imported into MapInfo. All deficiencies in the side scan sonar data coverage was found. A holiday line file was created from these mosaics and swath plots to complete the 200 percent requirement.

E.4 b. All contacts were digitized in CARIS SIPS. Digitizing a contact included measuring apparent height, and creating a "snapshot" of each image. All contacts were added to the HPS contact database. Snapshots for each contact were also integrated into the Caris data structure. Final positioning and least depth determination of all significant items were acquired with multibeam. (See section F)

All information concerning a contact was displayed in the Correlator program, including comparisons between contacts and AWOIS item positions, surrounding depths and contact cross-references. Correlator chartlets for contacts within specific charting recommendations are included in section N of the Descriptive Report, (Fig N1). Correlator chartlets for all other investigated contacts are included in Separates V. *FILED WITH THE ORIGINAL FIELD DATA*

E.4 c. The towfish was deployed exclusively from the stern.

F. MULTIBEAM SONAR EQUIPMENT & SOUNDING EQUIPMENT.

F.1 The BAY HYDROGRAPHER conducted all multibeam sonar operations using a RESON Seabat 9001 sonarhead, S/N 214019, 455 kHz, and a Seabat 9001 processor S/N 3314. The sensor head is mounted vertically (0° mount) at a depth of approximate 6ft below the water line on the end of a pole secured to the stern.

A stern mounted sensor head required the BAY HYDROGRAPHER to orient the sensor's projector aft, creating an azimuthal offset of 180°.

The 9001's combined transmit and receive beams yield sixty (60) soundings per ping, with each beam being 1.5° alongtrack x 1.5° crosstrack.

F.2 Multibeam operations were limited to a speed-over-

ground of 5.5 knots. Line spacing for item investigations was established by multiplying two times the water depth over an item investigation. Coverage was determined on-line using the coverage tools in Isis.

F.3 Contacts appearing significant from the side scan sonar imagery were investigated using the Seabat multibeam sonar. Passes were made directly over the contact, attempting to hit the contact as close to nadir as possible. Multiple passes with 5-10 meter line spacing were made over larger contacts and areas with numerous contacts to ensure complete coverage of the item(s).

F.4 Seabat depth data was monitored using Isis during acquisition and processed using CARIS HIPS multibeam data cleaning programs. Digital multibeam depth profiles were visually reviewed and fliers were identified and manually flagged as "rejected". Vessel navigation data from DGPS and attitude data from heave, pitch, roll, and gyro sensors were displayed and manually cleaned.

After review and cleaning, the data was then merged with sound velocity, tide, and vessel configuration data to compute the true depth and position of each beam footprint. Shoal biased, 5 meter binning with a 1-meter grid was used to import processed soundings into workfiles. Finally, final correctors were applied in HDCS to the processed soundings. Final review of soundings and least depth determination was accomplished in MapInfo.

F.5 The ODOM ECHOTRAC DF3200 MKII Echo Sounder S/N 9551 100/24Khz was used as the primary echo sounder for the entire survey.

F.6 Both high (100 kHz) and low (24 kHz) frequency sounding data were recorded during data acquisition. Only high frequency soundings were edited and plotted. Single beam data collected in conjunction with multibeam sounding data was not fully scanned and processed. These data sets were moved to an "Sbdata" subdirectory of the sheet directory. This data should not be used for smooth sheet compilation.

G. CORRECTIONS TO SOUNDINGS.

G.1 a. Sound Velocity Correctors

The velocity of sound through water was measured using SEABIRD ELECTRONICS, INC. SEA-BIRD 19 profiler (s/n 285). Seacat Data Quality Assurance Tests were conducted after each respective velocity cast to ensure that the unit was operating within tolerance. A DQA (Data Quality Assurance) was taken with each velocity cast using an Odom Digibar (S/N 168).

All sound velocity data was processed using program VELOCITY 4.0/5.0 for Windows. Computed velocity correctors for casts 001, 003, 004, 007, 008, 009, 010, 011, 012, 013, 015, 016, 089, 017, 018, 019, 020 were re-applied in HDCS to ^{odm}DSF data during post-processing to both high and low frequency soundings. Cast 01(C) was taken on day number 144 for adjacent Sheet C and is within survey limits for H10934. Sound velocity data for casts 21 and 22 were loaded and applied to the multibeam data in HIPS exclusively.

Cast #	DN Taken	DN Applied To:
01 (C)	144	145, 147
03	328	328, 333
04	336	336
07	349	349, 351
08	354	354, 355, 006, 007
09	024	024
10	045	045, 047, 048
11	053	053
12	061	060, 062, 067
13	068	068, 069, 070, 073
15	105	105
16	108	111
89	124	124
17	129	129
18	152	152, 153, 154
19	158	158
20	161	161
21,22	164	164

b. Leadline Comparison

The leadline comparison for this survey was conducted alongside Herrington Harbor South Marina, Rose Haven, MD on March 11, 1998 (DN 070). The water was calm, enabling the leadman to make multiple readings, and provided a steady fathometer reading.

A leadline comparison was taken after the installation of the Odom Echotrac on May 13, 1998 (DN 133). This leadline was taken during the first field test of the Odom Echotrac and is on file with the Hydrographic Systems and Technology Programs, Silver Spring, MD.

A leadline comparison was also taken February 24, 2000 (DN 055) at Point Lookout Marina, MD of the Odom Echotrac fathometer and the Reson Seabat multibeam sonar. The bottom was very soft, and, as expected, the 100khz Odom read 0.1m shoaler than the leadline, and the 455khz Seabat read 0.2m shoaler than the leadline.

c. Static Draft

On Jun 14, 1997, while the BAY HYDROGRAPHER was out of the water for repairs, LT(jg) Shep Smith and ST Mike Annis painted draft markings every tenth of a meter from the transducer on the side of the vessel. When the multibeam pole was installed in July 20, 1998, measurements were taken on the pole to determine static draft for the Seabat transducer. Sensor offsets were stored in the HIPS Vessel Configuration File for use in multibeam data processing. Refer to Separate III* for the vessel's Offset Table #1 entered in HPS and the vessel configuration file used in HIPS. * FILED WITH THE ORIGINAL FIELD RECORDS

d. Dynamic Draft (Settlement and Squat Correctors)

Settlement and squat correctors for the BAY HYDROGRAPHER were determined on the Chesapeake Bay, Maryland on January 12, 1999 using on the fly GPS for relative measurements. An Ashtech M12 receiver was set up on a triangulation mark at a point in Ridge, MD and a second was setup on the BAY HYDROGRAPHER. Both receivers' logged data for two continuous hours as the ship ran a series of runs and their reciprocal courses at varying speeds. The data was then run through a GPS processing program to yield a relative vertical change versus time and speed table. The values obtained were applied to soundings through the HPS Offset Table #1. Dynamic draft correctors were stored in the HIPS

Vessel Configuration File for use in data processing of multibeam data. Refer to Separate IV* for data records.

e. Heave, Roll, and Pitch Correctors

A TSS DMS-05 (S/N 002066) dynamic motion sensor collected heave, roll and pitch data. Heave correctors were collected during data acquisition and applied to data during Caris processing.

f. Heading data were acquired with Sperry SR-50 Gyrocompass and were used to determine both towfish and multibeam transducer azimuth and position.

g. Multibeam Calibration

On June 8, 1999 (DN 159), the BAY HYDROGRAPHER conducted the multibeam calibration (patch test) for the RESON system. The patch test measured the residual pitch and roll offsets, positioning time delay and azimuthal offset. All values obtained from the patch test and sensor offsets were entered in the HIPS Vessel Configuration File (VCF). See the VCF in Separate IIF* for data records.

The roll value of 1.5° was adjusted to 1.6° based on multiple passes over a large contact on this survey. The new value was used for this entire survey.

h. Tide Correctors

The tidal datum for this project is Mean Lower Low Water. Correctors were applied to all data using the tides utility in HDCS. Tide zones based on Lewisetta were provided with the project instructions.

A request for Smooth Tides was submitted on June 12, 2000. See Appendix V* for request for Smooth Tides.

Upon completion of H10934, approved tides were applied from Lewisetta, VA 863-5750. The hydrographer used an area thinning process at a 5-meter cell size in Caris HIPS. No reprocessing of multibeam data in HIPS should be necessary.

Approved tide correctors were reapplied to all multibeam data using HDCS tide utility upon completion of H10934.

The BAY HYDROGRAPHER employed no additional, unusual or
X FILED WITH THE ORIGINAL FIELD RECORDS

unique methods or instruments to correct echo soundings.

H. CONTROL STATIONS.

The horizontal datum for this survey is the North American Datum of 1983 (NAD 83). No horizontal control stations were used or established for this survey.

I. HYDROGRAPHIC POSITION CONTROL.

I.1 This survey was conducted exclusively using the Global Positioning System (GPS) corrected by the U.S. Coast Guard Differential GPS reference station network. Differential correctors were supplied from USCG radio beacon transmitters, precluding the need for shore-based horizontal control stations.

I.2 Accuracy requirements were met as specified by the Hydrographic Manual and Field Procedures Manual (FPM). The Horizontal Dilution of Precision (HDOP) and Expected Position Error (EPE) specified by the FPM were monitored during on-line data collection. If the positioning degraded beyond the acceptable limits while on-line, the data were either smoothed or rejected, depending on the extent of the affected data. The position of the vessel was verified in its slip at the start and end of each working day.

I.3 Differential GPS Equipment:

<u>Unit A</u>	<u>Unit B</u>
Starlink GPS Receiver	Trimble GPS Receiver
DNAV-212	DSM212L
Ashtech OEM Sensor II	s/n 0220177299
Starlink MRB-2A	Trimble Sensor
s/n 835	m/n 27207-00

I.4 Correctors were received from the Cape Henry, VA, and Cape Henlopen, DE radiobeacons for the entire survey.

I.5 There were no unusual methods used to operate or calibrate electronic positioning equipment. An unavoidable

fluctuation in GPS was found on DN 164 between adjacent multibeam lines 707 and 708. The contact was fully developed and is considered within tolerance of NOAA Specifications and Deliverables.

I.6 Antenna positions were corrected for offset and layback, and referenced to the position of the Odom Echotrac echo sounder transducer. These correctors are located in HPS Offset Table #1. A copy of Offset Table #1 is contained in Separate III.

Offsets for the GPS antenna were applied from the HIPS Vessel Configuration File (VCF) to compute the position of the Seabat transducer and the towpoint. See Separate III for data records.

J. SHORELINE.

Shoreline on the smooth sheet originates with NOAA Chart 12233 33rd Ed. May 02, 1998, and is for orientation purposes only.

K. CROSS LINES.

A combined total of 46.63 nautical miles of cross lines were acquired for this survey representing 11.8% of the 395.0 nautical miles of mainscheme hydrography.

Agreement between main scheme and cross line soundings was found to be excellent. The majority of compared soundings fell within 1foot of each other.

L. JUNCTIONS

Survey H10934 will junction with Sheet C to the northwest and Sheet A to the southeast. Comparisons of junctions with these surveys will be discussed in corresponding descriptive reports.

M. COMPARISON WITH PRIOR SURVEYS.

A comparison of prior surveys was not done in accordance with section 4, of the memorandum titled *Changes to Hydrographic Survey Processing*, dated May 24, 1995. The present survey is adequate to supersede the prior surveys within the common area.

N. ITEM INVESTIGATION REPORTS

See Correlator sheets for five contacts at end of section N. Correlator sheets are included in Separates V for all side scan contact investigation information.

N.1- Contact 175_19040005

See Correlator Sheet for above contact number.

Charts Affected: 12233,12285

Investigation Summary: This item was covered with 200% SSS and developed with shallow-water multibeam.

Charting Recommendation: The hydrographer recommends adding a dangerous obstruction with a least depth of 42 feet in the position indicated on the Correlator sheet. *COVER*

N.2 - Contact 175_19050001

See Correlator sheet for above contact number.

Charts Affected: 12233,12285

Investigation Summary: This item was covered with 200% SSS and developed with shallow-water multibeam.

Charting Recommendation: The hydrographer recommends adding a dangerous wreck with a least depth of 41 feet in the position indicated on the Correlator sheet. *COVER*

N.3 - Contact 278_20200002

See Correlator sheet for above contact number.

Charts Affected: 12233,12285

Investigation Summary: This item was covered with 200% SSS and developed with shallow-water multibeam.

Charting Recommendation: The hydrographer recommends adding a dangerous wreck with a least depth of 43 feet in the position indicated on the Correlator sheet. *CONCUR*

N.4 - Contact 349_11330001

See Correlator sheet for above contact number.

Charts Affected: 12233,12285

Investigation Summary: This item was covered with 200% SSS and developed with shallow-water multibeam.

Charting Recommendation: The hydrographer recommends adding a dangerous obstruction with a least depth of 26 feet in the position indicated on the Correlator sheet. *CONCUR*

N.5 - Contact 349_11330002

See Correlator sheet for above contact number.

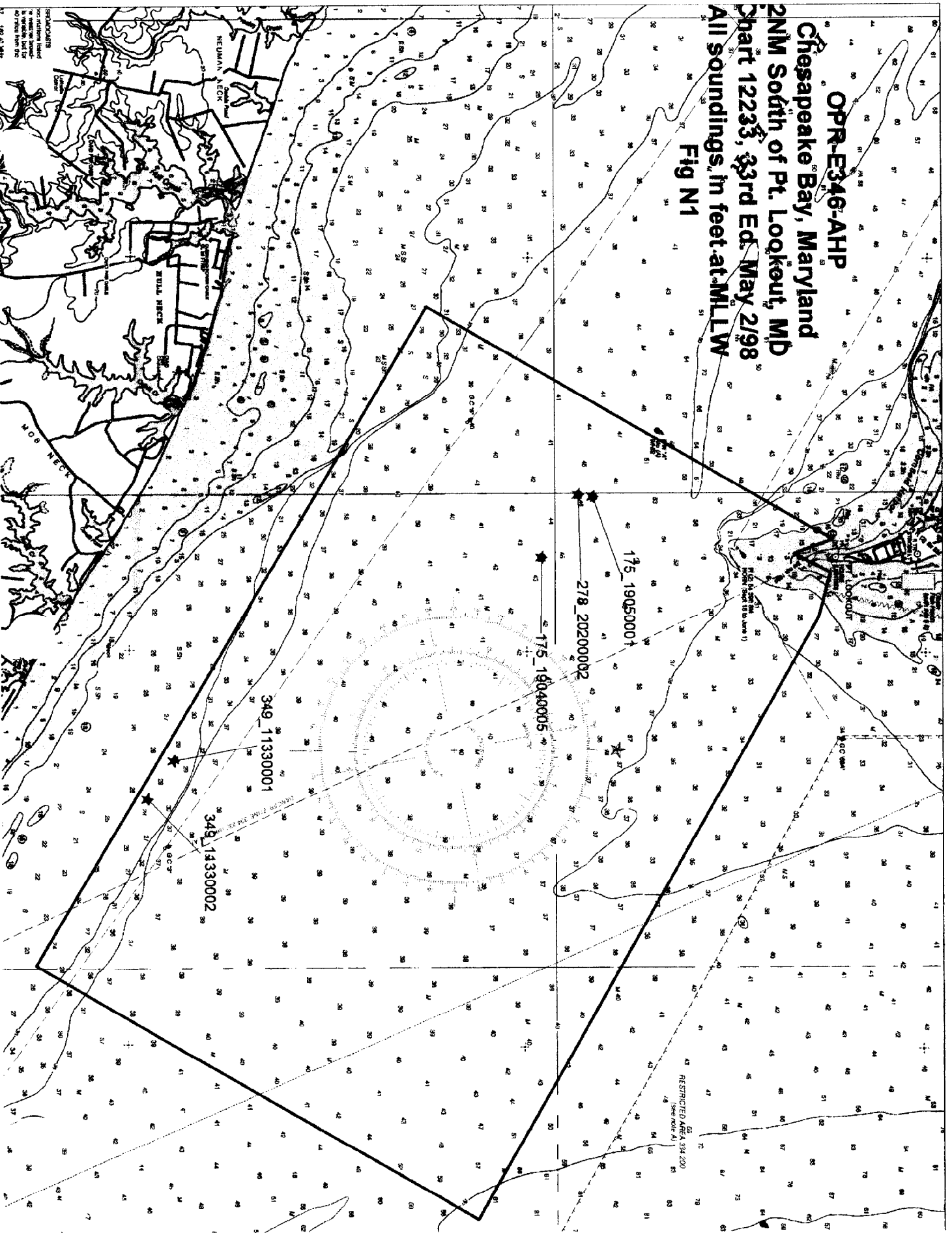
Charts Affected: 12233,12285

Investigation Summary: This item was covered with 200% SSS and developed with shallow-water multibeam.

Charting Recommendation: The hydrographer recommends adding a dangerous obstruction with a least depth of 25 feet in the position indicated on the Correlator sheet: *CONCUR*

OPR-E346-AHP
Chesapeake Bay, Maryland
2NM South of Pt. Lookout, MD
Chart 12233, 33rd Ed. May 2/98
All soundings in feet at MLLW

Fig N1



PROBABLE LISTED
SOUNDINGS
IN FEET AT MLLW
AS DERIVED FROM
SOUNDINGS
BY THE U.S. NAVY
IN 1825, 1848

175_19040005

Development

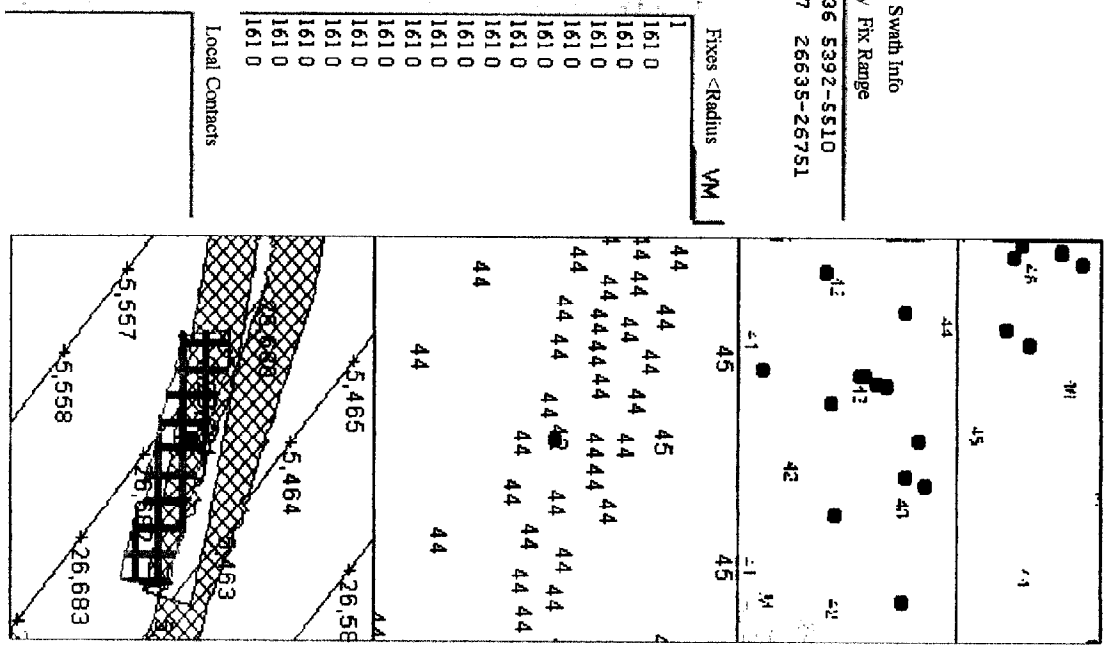
Least Depth 12.89 m AWOIS#
Least Depth 42 ft AWOIS Dist 0
Day of LD 161 LD Lat 37-59-53.15N
Contact Dist 1.9 LD Lon 076-19-20.01 W
LD Source B_MB_BH00_2000-161_704_1803_411_43

Charting Rec
Chart Item
OBSTN

Obstruction-possible wreck
Chart obstruction with least depth and ld position as above

Matching Swath Info
Line Day Fix Range
175 336 5392-5510
277 67 26635-26751

30 meters width 30 meters height



Resolution

SSS Height 0.8
Apparent Height 0.78
Average Depth 13.5
Top Depth
Length 0
Width 0

Significance Criteria
0.8 $\sqrt{1}$ m $\sqrt{20}$ m of $\sqrt{10}$ %
12.7 $\sqrt{25}$

Both Criteria must be red for

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact
0.78 $\sqrt{100}$ % 0.8

Multibeam Coverage
Number of Depths is greater than X
271 $\sqrt{7}$

Top Depth is greater than local
12.7 > 13.3

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

175_19050001

Development
 Least Depth 12.62 m AWOIS#
 Least Depth 41 ft AWOIS Dist 0
 Day of LD 161 LD Lat 38-00-18.36 N
 Contact Dist 7.2 LD Lon 076-19-58.13 W
 LD Source B_MB BH00 2000-161 703 1645 492 28

Comments
 Contact Remark
 Investigation
 Charting Rec
 Chart Item
 DLW/KMA

Wreck
 Chart dangerous wreck with least depth and ld position as above

Matching Swath Info
 Line Day Fix Range
 175 336 5392--5510
 277 67 26635-26751

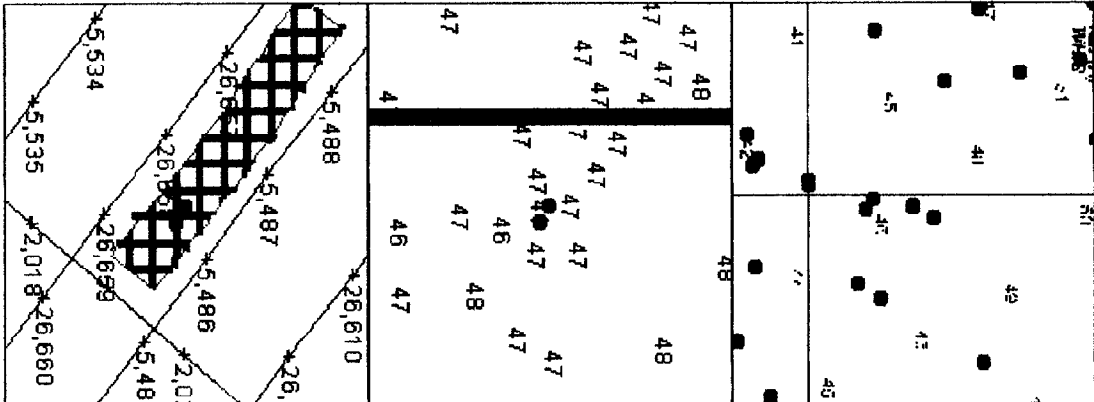
40 meters width 40 meters height



Fixes <Radius VM

1	161 0
	161 0
	161 0
	161 0
	161 0
	161 0
	161 0
	161 0
	161 0
	161 0
	161 0
	161 0

Local Contacts
 277_19570001 9.7645



Resolution

- SSS Height 2.3
- Apparent Height 2
- Average Depth 14.4
- Top Depth
- Length 0
- Width 0

Significance Criteria
 2.3 > 1 m / 20 m or 10 %
 12.1 < 25

Both Criteria must be red for

Auto-Signify Significant

Resolution Criteria

- Relief is greater than X% of contact
 2 > 100 % 2.3
- Multibeam Coverage
- Number of Depths is greater than X
 125 > 7
- Top Depth is greater than local
 12.1 > 14.2
- Any green means resolved

Auto-Resolve Resolved

Resolution Notes

278_20200002

Development
Least Depth 13.33 m AWOIS# 0

Least Depth 43 ft AWOIS Dist 0

Day of LD 161 LD Lat 38-00-11.81 N

Contact Dist 24 LD Lon 076-19-58.7 W

LD Source B MB BH00_2000-161_704_1648_396_3

177_19550001

ting Dist

5.3

right 0

cond Hr 1 38-00-11.47 N

m 076-19-59.59 W

Comments

Contact Remark	
Investigation	
Charting Rec	Chart dangerous wreck with least depth and ld position as above
Chart Item	
DLW/KMA	

Matching Swath Info

Line Day Fix Range

177 336 5634-5755

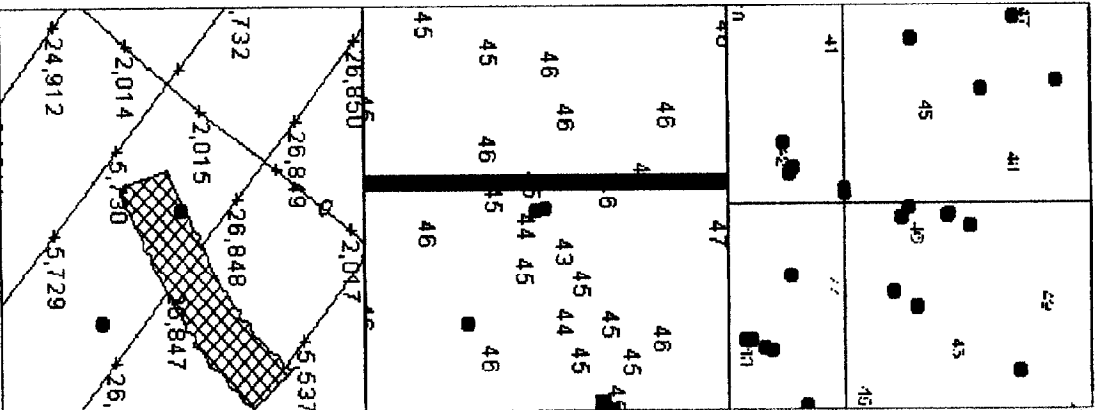
278 67 26752-26874

30 meters width 30 meters height



Fixes <Radius VM

1	161 0	161 0	161 0	161 0	161 0	161 0	161 0	161 0	161 0
Local Contacts	177_19550001 5.2976								



Resolution

SSS Height 0

Apparent Height 0.83

Average Depth 14

Top Depth 0

Length 0

Width 0

Significance Criteria

0 > 1 m < 20 m of 10 %

14 < 25

Both Criteria must be red for

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact

0.83 > 100 % 0

Multibeam Coverage

Number of Depths is greater than X

98 > 7

Top Depth is greater than local

14 > 13.9

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

349_11330001

Development

Least Depth 8.1 m AWOIS#
 Least Depth 26 ft AWOIS Dist 0
 Day of LD 164 LD Lat 37-56-50.72N
 Contact Dist 39.9 LD Lon 076-17-13.36 W
 LD Source B MB BH00 2000-164 706_1735_49_53

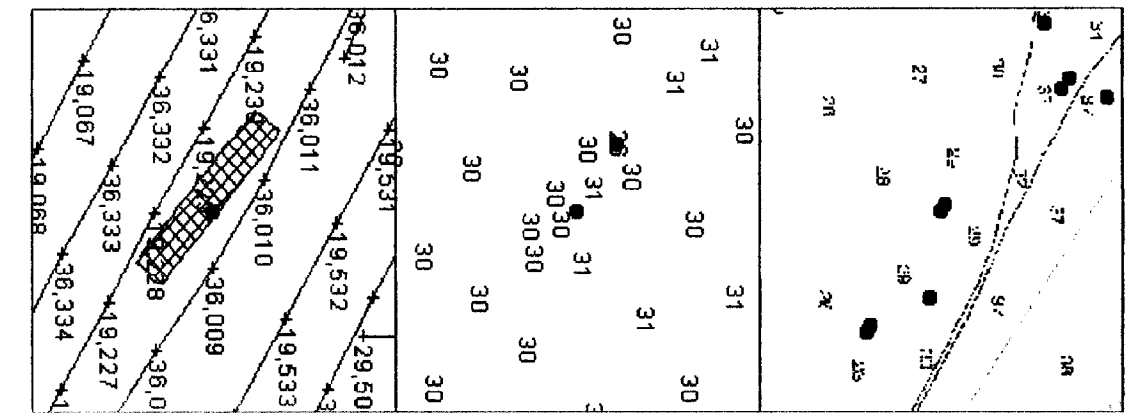
Chart Remark
 Investigation
 Charting Rese
 Chart Item
 OBSTN

Matching Swath Info
 Line Day Fix Range
 349 45 19154-19386
 450 129 35915-36013
 449 129 36171-36408



Fixes < Radius VM

1	164.0
164.0	164.0
164.0	164.0
164.0	164.0
164.0	164.0
164.0	164.0
164.0	164.0
164.0	164.0
164.0	164.0
164.0	164.0
164.0	164.0
164.0	164.0



Resolution

SSS Height 1.4
 Apparent Height 1.33
 Average Depth 9.4
 Top Depth 0
 Length 0
 Width 0

Significance Criteria

1.4 > 1 m < 20 m or 10 %
 8 < 25

Both Criteria must be red for

Auto-Sigrity Significant

Resolution Criteria

Relief is greater than X% of contact
 1.33 > 100 % 1.4

Multibeam Coverage

Number of Depths is greater than X
 87 > 7

Top Depth is greater than local
 8 > 9.3

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

O. COMPARISON WITH THE CHART

SEE ALSO THE EVALUATION REPORT

O.1 Two charts are affected by this survey:

Chart 12233
"Potomac River Chesapeake Bay to Piney Point"
33rd Ed. 02 May 1998
Scale: 1:40,000

Chart 12285
"Potomac River"
33rd Ed. 02 March 1996
Scale: 1:80,000

O.2 No danger to navigation report was submitted within the survey limits of H10934

O.3 Comparisons were made between H10934 and chart 12233. In general, agreement between charted soundings and surveyed soundings was excellent. Most charted depths agreed with survey soundings to within 1 ft. Item investigations on contacts within the Potomac River corridor revealed several unusual submarine features in the appearance of large mounds. These mounds generally are round and range from 10-60 meter in diameter, and up to 1 meter in height. They were developed with multibeam sonar and the least depths were brought through to the final smooth sheet. No unusual environmental conditions were experienced that affected hydrographic data collection. The BAY HYDROGRAPHER is aware of no planned construction or dredging within the survey limits of H10934, which would affect the survey results.

O.4 The charted notation "shoaling rep 1980", in the vicinity of 38°01'55.85N 076°19'11.1W has been adequately investigated by the present survey. The hydrographer recommends charting survey depths and deleting charted "shoaling rep 1980" notation. *Correct*

P. ADEQUACY OF SURVEY

This survey is complete and fully adequate to supersede prior survey data within common areas.

Q. AIDS TO NAVIGATION

The survey limits for this project contain three aids to navigation, as listed in the table below. During 200% side scan operations; all Aids to Navigation were picked off as contacts in Caris SIPS. They were then added to the HDCS contact database and overlaid on Chart 12233. All Aids to Navigation appear to serve their intended purpose. No new aids were found.

<u>Nav. Aid</u>	<u>Latitude</u>	<u>Longitude</u>
Fl (2) "5"	38°01'30.12"N	076°19'25.15"W
GC "5"	37°59'16.39"N	076°20'45.37"W
GC "3"	37°56'45.38"N	076°16'16.37"W

R. STATISTICS.

R.1 a.	Number of Positions217690
b.	Linear Nautical Miles of Sounding Lines:	
	Nautical Miles of Survey with the Use	
	of Side Scan Sonar	818.22
	Nautical Miles of Survey Without the Use	
	of Side Scan Sonar46.63
R.2 a.	Square Nautical Miles of Hydrography	
	per 100% of Coverage18.5
b.	Days of Production35
c.	Detached Positions3
d.	Bottom Samples9
e.	Tide Stations	0
g.	Velocity Casts.	19

S. MISCELLANEOUS. SEE ALSO: THE EVALUATION REPORT

S.1 b. No evidence of anomalous tides or tidal current conditions was found during this survey.

S.2 Bottom samples were taken at 1000-meter intervals. Additional samples were collected to confirm bottom characteristics that were evident on the side scan mosaics.

176_19320001

Development

Least Depth 12.23 m AWOIS#
Least Depth 40 ft AWOIS Dist 0
Day of LD 164 LD Lat 37-58-37.85 N
Contact Dist 35.5 LD Lon 076-17-34.03 W
LD Source B MB BH00_2000-164_700_1649_171_1

ting Dist 0

right 1.1

cond/Hk 1 37-58-38.96 N

m 076-17-33.66 W

Comments

Contact Remark

Investigation

Charting Rec

Chart Item

Chart least depth in area.

Matching Swath Info

Line Day Fix Range

176 336 5511-5633

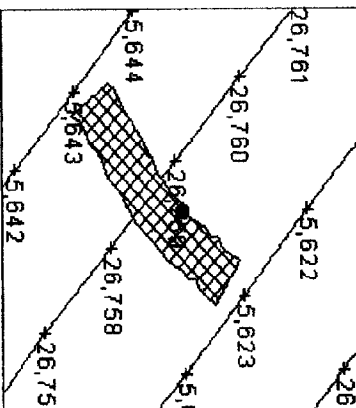
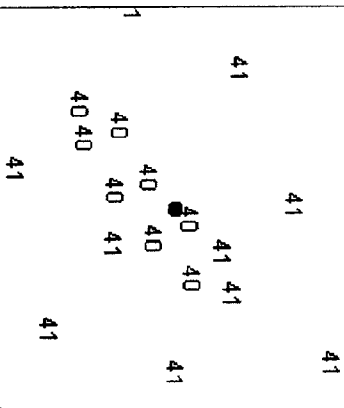
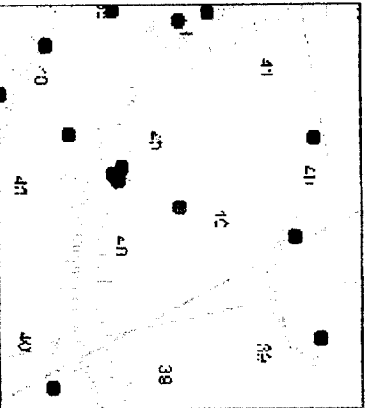
278 67 25752-26874

Fixes <Radius VM

1
164 0
164 0
164 0
164 0
164 0
164 0
164 0
164 0
164 0
164 0
164 0
164 0
164 0
164 0

Local Contacts

30 meters width 30 meters height



Resolution

SSS Height 1.1

Apparent Height 0.36

Average Depth 12.4

Top Depth

Length 0

Width 0

Significance Criteria

1.1 > 1 m < 20 m of 10 %

11.3 < 25

Both Criteria must be red for

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact

0.36 > 100 % 1.1

Multibeam Coverage

Number of Depths is greater than X

11.4 > 7

Top Depth is greater than local

11.3 > 12.3

Any green means resolved

Auto-Resolve Resolved

Resolution Notes

Samples were not retained as outlined in Hydrographic Survey Letter Instructions. Chartlets are attached.

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

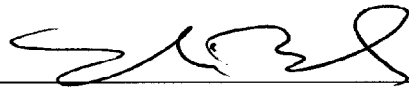
T.1 Significant contact 176_1932-0001 was developed with multibeam on DN 164. Post processing in HDCS revealed that the contact was only partially developed. The hydrographer

recommends additional multibeam coverage for this contact. The contact position and least depth as identified on the attached Correlator sheet is 40 feet 37 58 37.85N 076 17 34.03W.

U. REFERRAL TO REPORTS

No reports or data are referred to in this Descriptive Report that are not included with this survey.

This report is respectfully submitted.



Michael Ian Becker
Survey Technician
NOAA Survey Vessel BAY HYDROGRAPHER



LT Shepard M. Smith, NOAA
Officer-in-Charge,
NOAA Survey Vessel BAY HYDROGRAPHER

APPENDIX VII

LETTER OF APPROVAL

REGISTRY NO. H-10934

Field operations contributing to the accomplishment of this Navigable Area survey were conducted under my direct supervision with frequent personal checks of progress and adequacy. All field sheets and reports were reviewed in their entirety and all supporting records were checked as well.

This survey was completed with 200% side scan sonar coverage and multi-beam sonar and is more than adequate to supersede all prior surveys in common areas. The survey is considered complete and adequate for nautical charting.



Shepard M. Smith, LT, NOAA
Officer-in-Charge
NOAA Survey Vessel BAY HYDROGRAPHER



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: June 20, 2000

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: OPR-E346-BH-2000
HYDROGRAPHIC SHEET: H-10934

LOCALITY: Mouth of Potomac River, Chesapeake Bay, MD
TIME PERIOD: October 12, 1999 - June 12, 2000

TIDE STATION USED: 863-5750 Lewisetta, Potomac River, MD
Lat. 37° 59.8'N Lon. 76° 27.9'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 0.420 meters

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: POTR1, NCB9, NCB10, NCB11 & NCB12.

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.

Note 2: Preliminary analyses of the water levels at Lewisetta, VA (863-5750) indicate that, over a 21 month time period (5/1998 - 2/2000), the pier where the actual tide gauge is located may have undergone a vertical drift of up to 23 mm. Therefore, the six minute water level values given along with this tide note may be adjusted at a future date by up to 23 mm after further analyses are completed. This 23 mm uncertainty does not result in the tide reducers exceeding error budget specifications.

Thomas R. Mero 6/21/00
CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION



Printed on Recycled Paper



**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H10934 (1999-2000)**

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.

Survey H10934 has been selected as a platform to pioneer and develop NOAA's proficiency in producing hydrographic surveys that are fully compatible with Electronic Nautical Chart (ENC) systems and their associated international standards. Refer to Memorandum dated July 6, 2000 appended to the Descriptive Report.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

The following software was used to process data on the NOAA survey vessel BAY HYDROGRAPHER:

CARIS, version 4.3.3
Hydrographic Object Manager, version 3.06 (HOM)

The smooth sheet was plotted using a Hewlett Packard DesignJet 750 plotter.

**O. COMPARISON WITH CHARTS 12233 (33rd Edition, May 02/98)
12285 (33rd Edition, Mar 02/96)**

The charted hydrography originates with prior surveys. The hydrographer gives an adequate comparison with the charted depths and the present survey in section O.3 of the Descriptive Report.

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

P. ADEQUACY OF SURVEY

This is an adequate hydrographic/side scan survey. A recommendation for additional development is discussed in section T. of the Descriptive Report.

S. MISCELLANEOUS

Chart compilation was done by Atlantic Hydrographic Branch personnel on board the NOAA survey vessel BAY HYDROGRAPHER. Compilation data will be forwarded to the Marine Chart Division, Silver Spring, Maryland.

H10934

The following NOS Chart was used for compilation of the present survey: 12233 (33rd Edition, May 02/98)

H10934

Eric J. Sipos LT/NOAA 7-6-00
Eric J. Sipos
Lieutenant, NOAA
Verification of Field Data

Richard H. Whitfield
Richard H. Whitfield
Cartographer
Evaluation and Analysis

Description of S-57 Smooth Sheet and H-Drawing to Accompany H10934

There are two S-57 files submitted with this survey, one for the Smooth sheet and one for the H-Drawing. They are of substantially the same form described below.

Soundings are attributed with the sounding technique to distinguish between multibeam and singlebeam soundings. All other attributes are covered by the M_SREL and other metadata objects that cover the survey area.

Wrecks and obstructions are attributed with all known information.

Point bottom samples are included, attributed with all known information.

Seabed areas were determined using the side scan sonar mosaics in conjunction with the bottom samples. The areas are included in the S-57 file and attributed with the appropriate information.

Depth contours are generalized by hand in the H-drawing and raw in the Smooth sheet.


The internal units of both the files are in meters, but the contours in the H-drawing are in the meter equivalents of the appropriate charted contours. In the smooth sheet, the contours are at the whole meter, without regard to rounding (for example, the 10 m contour is the 10.000m contour). In the H-drawing file, to keep with the customary practice, the contours are at the rounding threshold (for example, the 6ft curve is actually the 6.777 foot curve (2.066m).

On the H-drawing, contours that have been extrapolated outside the survey area to junction with the charted contours are attributed with QUAPOS value of "estimated". Curves based solely on survey data are attributed with QUAPOS value of "surveyed."



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

MEMORANDUM FOR: Captain Samuel P. DeBow, NOAA
Chief, Hydrographic Surveys Division

FROM: 
Michael B. Brown
ENC Product Manager, Marine Chart Division

SUBJECT: Examination of H-10934

On July 12, 2000, I examined the digital files for survey H-10934 and its associated "H-drawing." I used both dKart Inspector and ArcView 3.2 software to view the data for comparison with the hardcopy plots. Based on this initial examination, the contents of the files appear to correspond with the data portrayed on the plots. Note that the digital file for the H-drawing is in metric units, while the plot is in feet. Several sounding values and all obstructions and wrecks were spot-checked and were converted correctly, but an exhaustive comparison of converted values was not conducted.



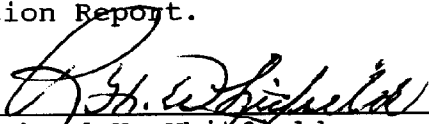
Printed on Recycled Paper



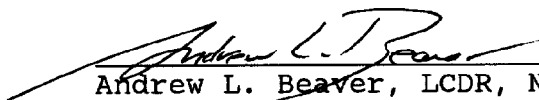
**APPROVAL SHEET
H10934 (1999-2000)**

Initial Approvals:

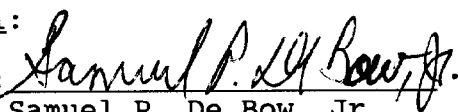
The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disapproval of charted data. The digital data have been completed and all revisions and additions made to the smooth sheet 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: July 10, 2000
Richard H. Whitfield
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: 7/10/00
Andrew L. Beaver, LCDR, NOAA
Chief, Atlantic Hydrographic Branch

Final Approval:

Approved:  Date: July 13, 2000
Samuel P. De Bow, Jr.
Captain, NOAA
Chief, Hydrographic Surveys Division

