

H10529

NOAA FORM 76-36A

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

DESCRIPTIVE REPORT

Type of Survey **HYDROGRAPHIC**

Field No. **MI-5-01-94**

Registry No. **H-10529**

LOCALITY

State **VIRGINIA**

General Locality **JAMES RIVER**

Sublocality **APPROACHES TO**

FORT EUSTIS

19 94

CHIEF OF PARTY

CAPT, N. A. PRAHL, NOAA

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DATE **JAN 18 1996**

HYDROGRAPHIC TITLE SHEET

H-10529

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.

MI-05-01-94

State Virginia

General locality James River

Locality Approaches to Fort Eustis

Scale 1:5000 Date of survey 15 March - 21 March 94

Instructions dated February 04 1994 Project No. S-E910-MI-94

Vessel NOAA Ship MT MITCHELL S-222, Launches 1021 (2223) and 1002 (2224)

Chief of party CAPT Nicholas A. Prah

Surveyed by J.A. Ferguson, M.P.M. Soracco, J.D. Swallow, S.R. Williams, J.D. Graham, E.J. Van Den Ameele, J.A. Mann, M.E. Ahern

Soundings taken by echo sounder, hand lead, pole DSF-6000N

Graphic record scaled by MT MITCHELL survey personnel

Graphic record checked by MT MITCHELL survey personnel

Protracted by N/A Automated plot by Zeta 936 Plotter (FIELD) ENCAD NOVAJET III (AHS)

Verification by ATLANTIC HYDROGRAPHIC BRANCH PERSONNEL

Soundings in ~~fathoms~~ ~~feet~~ ~~m~~ MLW MLLW meters FEET

REMARKS: Investigation of AWOIS item #'s 8878, 8879

Basic Hydrography

Time zones used: 0 (UTC) for data collection, +5 (EST) for Tidal Data

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

AWOIS/SURFV 2/12/96

DP 1-18-96

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REMOVED FROM ORIGINAL DESCRIPTIVE REPORT; FILED
WITH FIELD RECORDS.

A. PROJECT

A.1 This survey was conducted in accordance with Project Instructions S-E910-MI-94, Fort Eustis, Virginia.

A.2 The original date of the instructions is February 04, 1994.

A.3 No changes were made to the Project Instructions affecting this survey.

A.4 This sheet was designated by the project instructions as "Virginia, James River, Approaches to Fort Eustis.."

A.5 Project S-E910-MI-94 responds to a request from the NOAA Officer Training Center for updated survey data covering the approaches to Fort Eustis and the pier areas at their facility. In addition, the U.S. Army is interested in obtaining modern survey data to update the channel and basin depth information. The data from this survey will be used to compile a new 1:5,000-scale inset for NOS Chart 12248.

B. AREA SURVEYED

B.1 This survey is located in the Fort Eustis Basin and approaching waters. Existing depths are between 0 and 10 meters. Two AWOIS Items are included on this sheet. The traffic in the area includes the following military vessels: Landing Craft- Mechanized, Landing Craft- Utility, and tugboats. Small, private gravel barges also transit through the harbor up Skiffes Creek.

B.2 The survey sheet is rectangular and delineated to the ^{SOUTH} ~~north~~ and ^{NORTH} ~~south~~ by latitudes 37° 09' 40.00" N and 37° 11' 42.49" N respectively, and to the east and west by longitudes 076° 39' 00.56" W and 076° 34' 53.21" W, respectively.

The requirement on this survey sheet was basic hydrography. The areas within AWOIS search radii were covered with 25 meter line spacing. The charted positions and search radii for the AWOIS items on this survey are as follows:

<u>AWOIS Item #</u>	<u>Charted Position</u>	<u>Search Radius (meters)</u>	<u>AWOIS Item #</u>	<u>Charted Position</u>	<u>Search Radius (meters)</u>
8878	037° 10' 15.00" N 076° 36' 17.00" W	100	8879	037° 10' 09.00" N 076° 36' 25.00" W	100

B.3 Data acquisition began on March 16, 1994 (DN 075) and concluded on March 21, 1994 (DN 80).

C. SURVEY VESSELS

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

<u>VESSEL</u>	<u>ELECTRONIC DATA PROCESSING NUMBER</u>	<u>PRIMARY FUNCTION</u>
JENSEN LAUNCH 1021 (MI-3)	2223	Hydrography, Bottom Samples
JENSEN LAUNCH 1002 (MI-4)	2224	Hydrography, CTD casts

C.2 There were no unusual vessel configurations used in this survey.

**D. AUTOMATED DATA ACQUISITION AND PROCESSING - SEE ALSO SECTION D.
OF THE EVALUATION REPORT.**

D.1 Survey data acquisition and processing were accomplished using the HDAPS system with the following software versions (Installation date: 14 March 1994):

<u>Program Name</u>	<u>Version</u>
BACKUP	2.00
BASELINE	1.14
BIGABST	2.07
BIGAUTOST	3.01
BLKEDIT	2.02
CARTO	2.13
CLASSIFY	1.05
CONTACT	2.34
CONVERT	3.62
DAS_SURV	6.70
DIAGNOSE	3.04
DISK_UTIL	1.00
DP	2.14
EXCESS	4.21
FILESYS	3.24
GRAFEDIT	1.06
GPSCHECK	1.00

HIPSTICK	1.01
HPRAZ	1.26
INVERSE	2.01
LISTDATA	1.02
LOADNEW	2.10
LSTAWOIS	3.07
MAINMENU	1.20
MAN_DATA	2.01
NEWPOST	6.01
PLOTALL	2.27
POINT	2.10
PREDICT	2.01
PRESURV	7.08
PRINTOUT	4.03
QUICK	2.05
RAMSAVER	1.02
REAPPLY	2.10
RECOMP	1.02
SCANNER	1.00
SELPRINT	2.04
ZOOMEDIT	2.24
VERSIONS	1.00

Several software problems were discovered and resolved by adding or changing HDAPS program lines. In all instances, the HDAPS Office was consulted prior to any change in program lines. These changes were later issued to fleet users on HDAPS Software disks dated April 04, 1994 Update 94-2. None of these changes affected the quality of acquired data.

A *LOTUS 1-2-3* spreadsheet was used to compute the DGPS performance checks.

D.2 Two programs were used to determine velocities: *VELOCITY* version 2.00, and *CAT* version 2.00, both dated December 18, 1992. The *CATCRE.EXE* module of *VELOCITY* was updated June 02, 1993.

D.3 There were no nonstandard automated acquisition or processing methods used.

E. SONAR EQUIPMENT: Side scan sonar was not required for this survey.

F. SOUNDING EQUIPMENT

F.1 All hydrographic soundings were acquired using a Raytheon 6000N digital survey fathometer (DSF). The following list shows the equipment serial numbers and corresponding dates used:

<u>Vessel Number</u>	<u>Manufacturer's Serial Number</u>	<u>Dates Used</u>
2223	C066	16 MAR - 21 MAR
2224	B047N	16 MAR - 21 MAR

F.2 System checks on launch fathometers were performed using lead lines in the area of survey at depths less than 10 meters. These lines were calibrated as per instructions in the Hydrographic Manual section 7.2.1.2.

F.3 No problems were encountered with data acquisition using the DSF-6000N fathometer.

F.4 Both the high (100 Khz) and the low (24 Khz) frequency sounding data were recorded during data acquisition. Only high frequency soundings were digitized and selected for plotting. Low frequency sounding data were examined for spikes indicating nearby items. These spikes were added as inserts to the digital records and plotted.

G. CORRECTIONS TO SOUNDINGS

G.1 a) The velocity of sound through water was determined by Seacat conductivity, temperature and density gages (serial numbers 192472-0284, 192472-0285). The sensors on the CTD units were last calibrated on December 22, 1993.

A simultaneous independent test was made between these CTD units in 9.5 meters of water. Using the comparison utility of the *VELOCITY* program, the percent difference between the two was 0.0%.

A second cast was made on March 20, 1994 in 12 meters of water. This cast was conducted because the table extension from the initial cast did not extend beyond depths of the survey. The second cast data was nearly identical to the initial cast and added one additional data point for the velocity table. The percent difference between this cast and the simultaneous independent test was 0.0%. The velocity table generated from the cast on March 20 was reapplied to all data.

A Data Quality Assurance test was run for the second cast to ensure the meter was within tolerance. The DQA test was performed using hydrometers manufactured by H-B Instrument Company.

All data were processed using *VELOCITY* Version 2.00 and *CAT* Version 2.00 software. The computed velocity correctors were entered into the HDAPS sound velocity Table 1 and applied to digitized high frequency soundings. The HDAPS Velocity Table cited below was computed for a launch transducer draft of 0.7 meters for launch 2223 and 0.6 meters for launch 2224. Both launches used Table 1.

<u>Cast Number</u>	<u>Date</u>	<u>Latitude</u>	<u>Longitude</u>	<u>HDAPS Table #</u>	<u>Applied To Day #'s</u>
02	21 MAR 94	37° 10' N	076° 38' W	01	075 - 080

b) There was no variation in the fathometer's instrument initial.

c) No instrument correctors to the fathometers were required.

d) No instrument corrections were determined from direct comparison of lead line checks. Lead line comparisons with the fathometer were made twice for each launch during the times of surveying. The range of correctors was determined for each fathometer. The correctors were within 0.1 meters, indicating that all survey fathometers were working within accuracy requirements. These values were not applied to the survey data as instrument correctors. The following table contains the lead line comparisons:

<u>Fathometer</u>	<u>Lead Line</u>		<u>Digital</u>	<u>Draft</u>	<u>Velocity</u>	<u>Corrected</u>	<u>Instrument</u>
	<u>DN</u>	<u>Depth</u>	<u>Depth</u>		<u>Correction</u>	<u>Depth</u>	<u>Correction</u>
B047N	075	3.1	2.5	0.6	-0.1	3.0	+0.1
B047N	079	2.5	2.0	0.6	-0.1	2.5	0.0
C066	075	3.0	2.4	0.7	-0.1	3.0	0.0
C066	077	5.6	5.2	0.7	-0.2	5.7	-0.1

All depths in meters

e) All sounding correctors were applied to both the narrow (100 Khz) and the wide (24 Khz) beams.

f) The static draft of launch 2223 was determined in March 1994 and launch 2224 was determined in April 1993. Both launches were out of the water at the Atlantic Marine Center, Norfolk, Virginia. A calibrated steel tape was used to measure the distance from the transducer to a reference line for each launch above the water line. The launches were then put into the water and the distance from the water line to the reference line was measured. A static draft of 0.7 meters was used in HDAPS Offset tables for launch 2223 and 0.6 meters for launch 2224. (refer to Separates III). * FILED WITH FIELD RECORDS

g) Settlement and squat correctors for the Jensen launch (2223) were determined, using procedures outlined in the Hydrographic Manual, on the Elizabeth River on March 14, 1994. Launch 2224 was determined in April of 1993. For both launches, the same procedure was followed:

An observer, stationed with a level on a pier, measured changes in relative height as each launch ran toward and away from the observer at various speeds. The settlement and squat correctors were applied to soundings through the HDAPS offset

table. Refer to Separates III for copies of the observed settlement and squat data. Settlement and squat were run in similar environmental conditions as the area of survey.

h) Neither launch is equipped with a heave, roll and pitch sensor.

G.2 The HDAPS program "Reapply" was used for data collected on the same day as a velocity cast. The cast used to make the velocity table was conducted on 21 March, 1993 (DN 80).

G.3 There were no special correctors to be applied to the fathometers or velocity zoning required.

G.4 Pneumatic gages were not used during this survey.

G.5 MT MITCHELL personnel scanned the sea action out of the fathograms and edited the selected soundings accordingly. In some instances, non-selected soundings were changed to selected soundings during processing because of too much distance between the original selected soundings.

G.6 a) The tidal datum for this project is Mean Lower Low Water. Times of high and low water at the control station Hampton Roads, VA (863-8610) were provided by the Hydrographic Surveys Branch N/CG24 on magnetic (floppy) disk prior to the start of the project.

b) The tide tables were applied on-line and during processing of sounding data. For a more detailed overview of tidal information refer to Appendix V.

c) Zoning was required for this project. Data was acquired using the appropriate tide table. For datasets which were gathered in different tide zones, the appropriate table was applied during processing resulting in a "multiple tide table" dataset. For a more detailed overview of zoning information refer to Appendix V. APPROVED TIDES AND ZONING WERE APPLIED DURING OFFICE PROCESSING.

H. CONTROL STATIONS - SEE ALSO SECTION H. OF THE EVALUATION REPORT.

H.1 The horizontal datum for this project is the North American Datum of 1983 (NAD 83).

H.2 Details concerning the horizontal control station is located in Appendix III

H.3 A NOAA VHF DGPS reference station was established at horizontal control station EUSTIS and was the only station used for positioning. Station EUSTIS was established by MT MITCHELL personnel on March 11, 1994. For a more detailed overview of the control

station refer to the attached Horizontal Control Report. The station meets the criteria for a Third-Order Class I horizontal control station. Program MONITOR was run to ensure no multi-path or site specific problems reduced the accuracy of the reference station.

In the operations of the *MONITOR* program, two GPS receivers were set up over the control station. An Ashtech M-XII GPS receiver generated correctors for each GPS satellite. These correctors are then transmitted to a second Ashtech M-XII GPS receiver which computes a DGPS position based on the GPS satellites and the correctors. This position is then fed into a computer running the *MONITOR* program, which compares this computed position to the known position of the control station. Under normal circumstances the program is left running for a 24 hour period. Due to A/C power limitations at the site, the *MONITOR* program could not be left to run over night. However, the *MONITOR* did run from 1413 until 2130 UTC, on March 18, 1994. Hydrographic operations never commenced before 1531, nor concluded after 2135 UTC, therefore, the *MONITOR* program observed all satellite configurations that were used during hydrography. Satellites rise four minutes earlier everyday, therefore, this limited *MONITOR* run could not be used for extended projects, however, the short duration of the Fort Eustis project allows the reduced time period. The mean radial error between the DGPS position and the NAD83 position of EUSTIS differed by 1.25 meters. A copy of the *MONITOR* program scatter plot and error statistics is included in Appendix III. * FILED WITH FIELD RECORDS.

H.4 MT MITCHELL personnel positioned control station EUSTIS. The station was positioned by static relative GPS, using 3 Ashtech M-XII receivers. Two existing NGS stations were recovered and used to compute a position and check position. All computations were based on the NAD 83 datum. Refer to the attached Horizontal Control Report for specific details. FILED WITH FIELD RECORDS.

H.5 The Horizontal Control Report is attached to this Descriptive Report. Control station EUSTIS is a temporary point. The station is a steel spike driven in the ground, with a chiseled "X" on the top. Its long term survivability is questionable. Therefore, the computations and final position will not be forwarded to NGS.

H.6 No problems or anomalies were encountered in positioning control of this survey.

I. HYDROGRAPHIC POSITION CONTROL

I.1 The primary method of sounding position control was Differential Global Positioning System (DGPS).

I.2 Following section 6.2 of the project instructions, an Estimated System Error (ESE) of 2.5 meters was used during all survey operations.

The Estimated Distance Error (EDE) value is calculated at 2 meters per 100 nautical

miles from the DGPS reference station. In this survey the maximum range from the DGPS reference station was 1.5 nautical miles. At this range the EDE is 0.03 meters. This is a negligible value and was not used to calculate the maximum allowed HDOP value (as described in section 3.4.2 of the FPM). With a maximum Expected Positional Error (EPE) of 7.5 meter (1.5 mm at a 1:5,000 scale), the maximum allowable HDOP for this project is 3.0. This was calculated by the formula given in section 3.4.2 of the FPM.

The HDOP value remained far below 3.0 for most of the survey. On occasions, the HDOP would increase drastically as several satellites would be obscured by structures. When this happened HDAPS entered "DR Mode" and began estimations of the vessel's position. If HDAPS was in the "DR Mode" for twenty seconds and failed to receive good navigation information, it forces a fix at the next selected sounding and breaks the survey line, thereby preventing questionable positioning data.

MT MITCHELL encountered several problems with DRed data on this project. When HDAPS is in the DR mode it sets a flag in the data to indicated that it is DRing. On several occasions this flag was inadvertently set by the system when it was started and remained on throughout the day affecting all data in all datasets. The problem was brought to the attention of the HDAPS Office and was quickly resolved with GPSCHECK v1.00 (3/21/94) issued by the HDAPS Office.

I.3 The manufacturer, model number and serial number of all DGPS equipment used during this survey is identified below:

<u>VESSEL #</u>	<u>MODEL</u>	<u>S/N</u>	<u>DATES USED</u>
Shore Station	Ashtech M-XII DGPS Receiver	700354B2501	16 MAR - 21 MAR
Shore Station	Maxon SM-3010-H VHF Receiver	57531	16 MAR - 21 MAR
Shore Station	GPS Antenna	700228D2313	16 MAR - 21 MAR
<u>VESSEL #</u>	<u>MODEL</u>	<u>S/N</u>	<u>DATES USED</u>
2223	Ashtech DGPS Receiver	700417B1004	16 MAR - 21 MAR
2223	Maxon SM-3010-H VHF Receiver	20813451	16 MAR - 21 MAR
2223	GPS Antenna	700391A0518	16 MAR - 21 MAR
2224	Ashtech DGPS Receiver	700417B1190	16 MAR - 21 MAR
2224	Maxon SM-3010-H VHF Receiver	01007558	16 MAR - 21 MAR
2224	GPS Antenna	700378A0468	16 MAR - 21 MAR
2224	MX50R Beacon Receiver	207	16 MAR - 21 MAR

I.4 DGPS performance checks were performed by comparing two independent DGPS systems. These checks were accomplished by placing the two launches side by side, one launch (MI-4) would use the United States Coast Guard Cape Henry Differential Beacon as a source of correctors, while the other (MI-3) would use the temporary VHF reference station on point EUSTIS as a source of correctors. The two independent DGPS positions would then be compared, if the positions were within 7.5 meters of one another, the check would be considered a success. An opening performance check, 2 mid project checks and a closing performance check were performed. All performance checks conducted for this survey were successful. A Lotus spreadsheet was developed to compute the performance checks. The Lotus spreadsheet results are included in Separates. *

I.5 No calibration data is applied to the DGPS raw positioning data.

I.6 a) No unusual methods of operation were employed with the DGPS equipment.

I.6 b) No equipment malfunctions or substandard operations were encountered.

c) No unusual atmospheric conditions were encountered.

d) No weak signals or poor geometric configurations were observed.

e) No adjustment or systematic errors were discovered.

f) Antenna positions were corrected for offset and layback, and referenced to the position of the DSF-6000N fathometer transducer. These correctors were located in the HDAPS Offset table, and applied on-line to the positioning algorithm. Launch 2223 used Offset table 3 and launch 2224 used table 4. Refer to Separate III* for a copy of offset tables used during this survey.

g) No side scan sonar data was collected on this survey.

J. SHORELINE

J.1 All shoreline comparisons in this survey area comes from NOAA chart #12248 (scale 1:40,000). No shoreline manuscripts were available for this project and shoreline was not drawn on the final field sheet. A chart blow up was not requested because proper verification could not be performed with the Jensen launch. Also, due to the scale differences between the chart and the survey, the shoreline would only give a rough approximation of the actual conditions.

J.2 Detached positions were obtained at all accessible shoreline features. Fix numbers 6206 - 6213 and 2360 - 2377 were used for detached positions on dolphins and pier faces. Additional information on these positions is in the accompanying shoreline logbook.

J.3 Field notes are contained in the shoreline logbook.*

J.4 Shoreline verification was completed on all significant man made features within the harbor basin accessible by Jensen launch. Shoreline verification was not conducted on the approaches, or in Skiffes Creek, or on the north shore of the harbor.

J.5 The charted shoreline was in agreement with the actual shoreline except for one obvious difference. The chart depicts a three-pronged pier (37 10 19.4 N, 076 36 13.4 W) but only the northern two prongs of the floating pier were present. Comparison between the chart and shoreline was difficult due to the scale differences, marshland, and draft restrictions of the Jensen launches.

J.6 Detached positions were taken on all significant pier corners and fixed navigational aids. The positions of the navigational aids are listed in Section Q. Refer to the shoreline logbook for details relating detached position numbers to geographical positions and permanent structures.

K. CROSSLINES

K.1 Crosslines on survey H-10529 equaled 10% of the total main-scheme sounding lines. Crosslines were run at or near 90 degree intersections to the main-scheme lines.

K.2 Crossline to main-scheme sounding intersection comparisons were good, with nearly all of the crossline soundings agreeing to within 0.3 meters or less with main-scheme soundings. Less than ten crossline soundings were greater than 0.3 meters deeper or shallower than neighboring mainscheme soundings. The fathometer traces of these areas were examined and the depth differences were attributed to the steep channel wall.

K.3 An intersection was considered a discrepancy if a crossline sounding on or near a main-scheme sounding differed by more than 0.3 meters. The discrepancies were reconciled by viewing the fathometer traces of the main-scheme and comparing them to those of the crossline. Seventeen soundings which fell outside of the 0.3 meter comparison range were investigated further and adjusted to compensate for sea action scanning or processing errors. After correction, all intersections, except those listed in K2, fell within the 0.3 meter requirement.

K.4 The vessel and sounding equipment used to run crosslines was also used in the main-scheme.

L. JUNCTIONS

This survey did not junction with any contemporary surveys.

M. COMPARISON WITH PRIOR SURVEYS

M.1 The Project Instructions require comparison with the following prior surveys:

<u>Registry #</u>	<u>Scale</u>	<u>Date</u>
H-7087	1:10,000	1946-47
BP 145603	-----	1990
PWC14972A	1:100	FEB 1994

Since the time of the survey listed above (BP 145603) the Fort Eustis approach and harbor has been dredged. The harbor and channel were dredged just weeks prior to MT MITCHELL's arrival at Fort Eustis and at the time of this report (April 15, 1994), the Fort Eustis Approach and Basin were dredged once again. Further details of the dredging are discussed in Section M.5.

M.2 The area of survey has been dredged so a comparison to the quality of agreement with prior surveys will not be discussed. Comparisons with the preliminary February post-dredge survey are discussed in Section M.5.

M.3 All the significant features from the BP 145603 survey included in this survey area are discussed under section N.

M.4 The trend of the bottom slope of Fort Eustis Approaches and Harbor will not be discussed. (See M.2)

M.5 A post dredge survey was borrowed from the Fort Eustis Harbormaster and used to compare acquired data. The post dredge survey was conducted by the Navy Public Works Center, Norfolk, Virginia. The area covered by the post dredge survey is limited, mainly covering the approach and sides of the main pier. Depths from the Naval survey were 0.3 to 0.6 meters shallower than depths obtained in survey H-10529. Depths on the post dredge survey are in feet referred to Mean Low Water and based on interpolated predicted tides. The Naval survey depicts similar bottom slopes when compared to H-10529.

As of April 15, 1994, conversations with Harbormaster (CW4 Brewster) revealed that the approaches and basin were completed. Additional dredging had taken place after the MT MITCHELL survey at the entrance to the channel and other "high spots" according to the Fort Eustis Harbormaster. The controlling depth of the approach and basin were contracted to be twenty plus two feet. The preliminary post-dredge survey has been included in Appendix VI.*

N. ITEM INVESTIGATION REPORTS

Two AWOIS items were investigated within this survey area.

AWOIS 8878

State and Locality: Fort Eustis, Virginia

Charted Position: 37/10/15.00 N 076/36/17.00 W Search Radius: 100

Datum: MLLW

Type of Feature: Obstruction

Source: Source Unknown: Line of piles first charted in the mid 1950's. Listed position is the G.P. of southernmost pile. scaled from chart 12248 (1:40,000).

Survey Requirements: Salvage Documentation, Bottom Drag, and Diver Investigation. As conditions allow, a 100 meter search swath is required, 50 meters either side of line of charted piles.

Method of Investigation: Visual Investigation

Results of Investigation: A line of seven piles in the same formation as the charted piles exists 488 meters to the northeast. The piles are approximately 2 meters tall with a diameter of 0.3 meter. The surrounding water depths were less than one meter. DP 2376 was taken at the southern most pile.

This item matches the AWOIS description.

Comparison with Prior Surveys: See "Source" section above.

Comparison with Chart: The line of piles on the chart was not found. A line of piles similar to the charted line was found approximately 488 meters to the northeast. ✓

Recommendation: Delete charted row of piles.
Chart a row of seven piles at: 37:10:30.839 N
076:36:16.301 W

CONCUR

AWOIS 8879

State and Locality: Fort Eustis, Virginia

Charted Position: 37/10/09.00 N 076/36/17.00 W Search Radius: 100

Datum: MLLW

Type of Feature: Obstruction

Source: Source unknown: Two piles first charted in the early 1960's. Charted with the notation "Dol" indicating use as mooring points at one time and being more substantial than a single pile feature. Listed G. P. is position mid-way between the two piles and was scaled from chart 12248 (1:40,000).

Survey Requirements: Diver Investigation, Salvage Documentation, Bottom Drag. As conditions allow, a 100 meter radius is required centered mid-way between the two piles.

Method of Investigation: Visual search

Results of Investigation: Three dolphins were found within the search radius of the AWOIS item. These dolphins are currently in use as mooring points for Army barges. Detached positions were taken as close to the dolphins as allowed amidst the presence of the barges. The water to the north of these dolphins is not navigable by Jensen launch.

The dolphins contain about five piles and stand above water approximately 3 meters. Detached positions 2363, 2364, and 2365 were used to position these items. Refer to the shoreline logbook for a sketch and detached position information regarding range and bearing from the actual DP and item.

This item matches the AWOIS description.

Comparison with Prior Surveys: See "Source" section above.

Comparison with Chart: Item was nearby charted position. The chart only shows two dolphins, but three were present at the time of survey.

Recommendation: Delete the charted dolphins. Chart three dolphins at the following positions:

37:10:13.738 N	37:10:14.575 N	37:10:12.051 N ✓
076:36:20.300 W	076:36:19.558 W	076:36:22.124 W

CONCOR.

O. COMPARISON WITH THE CHART

O.1 The following chart is affected by this survey:

<u>Chart #</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>
12248	32nd	October 16, 1993	1:40,000

No Notice to Mariner changes affected chart #12248 during this survey.

O.2 No Danger to Navigation Reports were submitted for this survey.

O.3 a) Soundings from Chart #12248 were compared to this survey. All soundings from the chart were compared to their respective depths from survey H-10529 and found to be generally one meter deeper than the charted depths.

b) General trends depicted on Chart #12248 were in agreement with this survey. Contour line agreement between the chart and this survey is similar.

c) There was evidence in the channel as to where dredging was started and where it ended. The channel was shallower at the entrance buoys than it is at the mid point towards the pier. Recent dredging (See Section M.5) was to establish a controlling depth of twenty plus two feet.

d) There is a dredged channel within the survey area.

e) The approach to Fort Eustis and the basin were covered with North-South sounding lines with 25 meter spacing. Three additional cross lines were run along the range line and down the outer markers of the channel. The chart indicates the channel to be good for 17 feet. Dredging was to establish a controlling depth of twenty plus two feet (See Section M.5). Additional dredging was performed after MT MITCHELL surveyed the harbor and approach.

O.4 Non-sounding features along the shoreline are discussed under Section J. The only obvious discrepancy between the chart and actual area was that the charted three-pronged pier (37 10 19.4 N, 076 36 13.4 W) had only two prongs (See Section J.5).

Recent conversations with the Fort Eustis Harbormaster CW4 Brewster indicated the USCG placement of a small buoy adjacent to daybeacon G '5.' Also, he conveyed that the USCG planned to reposition daybeacons G '7' and G'9' after completion of the dredging contract.

O.5 No changes to the scale or coverage of the published charts of the survey are recommended.

P. ADEQUACY OF SURVEY - SEE ALSO SECTION P. OF THE EVALUATION REPORT.

P.1 The H-10529 survey is sufficient to supersede prior survey data outside of the dredged area. See Section T.1

P.2 This survey is complete and adequate for the purpose of updating the charted sounding data as of March 20, 1994. Since then, more dredging has occurred in the Fort Eustis area. Details concerning what was dredged after the MT MITCHELL survey have not been acquired. Prior to the arrival of the MT MITCHELL detachment, the channel had been dredged from the approximate positions of daybeacons G '3' and R '4' eastward into the harbor. (See Section M.5).

Q. AIDS TO NAVIGATION

Q.1 The MT MITCHELL did not correspond directly with the U.S. Coast Guard regarding floating aids to navigation. The Fort Eustis Harbormaster relayed messages verbally. Detached positions were taken on all floating aids and navigational aids accessible by survey launch.

Q.2 Floating Aids

Chart #12248 depicts two floating aids to navigation in the approach to Fort Eustis. A comparison between charted locations and survey locations revealed that all aids are charted within a few meters of the actual positions and agree with their respective charted light characteristics. According to the Fort Eustis Harbormaster, a USCG buoy has been placed adjacent to daybeacon G '5' one month after the MT MITCHELL survey.

The floating aids serve their intended purpose of marking the limits of the channel. The following list compares the positions listed in the *Light List* with the positions found during the survey:

AIDS TO NAVIGATION LIGHT LIST POSITION COMPARISON:

No.	Name and Location	Position	D.P. Position	D.P. Fix Number
11825	Buoy 2 Entrance, Lighted	37 09.9 76 37.8	37 09 51.463 N 076 37 45.432 W	6198
11830	Buoy 1 Entrance Buoy	37 09.9 76 37.9	37 09 54.713 N 076 37 45.437 W	6199

Non-floating Aids

A comparison between charted locations and survey locations revealed that all non-floating aids are charted within a few meters of the survey determined positions, and agree with their respective charted light characteristics.

The positions of the daybeacons in the *Light List* Volume II (Entries 11835, 11840, 11845, 11850, 11855, and 11865) matched the detached positions taken during the survey. Two daybeacons were removed due to dredging: G 7 and G 9. The following list compares the positions listed in the *Light List* with the positions found during the survey:

No.	Name and Location	Position	D.P. Position	D.P. Fix Number
11835	Directional Light	37 09.0 76 36.4	Exists: Not positioned by MT MITCHELL	
11840	Daybeacon 3	37 09.9 76 37.3	37 09 56.996 N 076 37 20.347 W	6201
11845	Daybeacon 4	37 09.9 76 37.3	37 09 53.340 N 076 37 18.944 W	6202
11850	Light 5	37 09.9 76 36.9	37 09 57.935 N 076 36 54.998 W	6203
11855	Light 6	37 09.9 76 36.8	37 09 55.051 N 076 36 48.942 W	6204
11860	Daybeacon 7	37 10.0 76 36.7	Removed for Dredging	
11865	Daybeacon 8	37 09.9 76 36.6	37 09 54.210 N 076 36 37.289 W	6205
11870	Daybeacon 9	37 10.1 76 36.6	Removed for Dredging	

Q.3 No aids were found that were not listed in the *Light List*.

Q.4 No overhead cables or pipelines were within the survey limits. A foot bridge was within the survey sheet at approximate position LAT 37:10:18N, LONG 076:36:05, however it was unaccessible by survey launch. Its position does not interfere with routine vessel operations in the area.

- Q.5** a) No submarine cables were present during the survey.
 b) No pipelines crossing to shore were present within the survey limits.
 c) There are no designated ferry routes.

Q.6 There were no designated ferry terminals in the survey area.

R. STATISTICS

	<u>Total</u>
R.1 a) Number of positions:	749
b) Lineal nm coverage: (Hydrography)	31.99
R.2 a) Total square nautical miles:	0.25
b) Total days of production:	9
c) Detached positions:	30
d) Bottom samples:	11
e) Velocity casts:	2
f) Dives:	1
g) Current Observations	0
h) Magnetic Observations	0

S. MISCELLANEOUS - SEE ALSO SECTION 5. OF THE EVALUATION REPORT.

- S.1** a) No unusual silting was noted during this survey.
 b) All unusual submarine features have been discussed previously.
 c) No anomalous tidal conditions were encountered.
 d) No significant currents were encountered during this survey.
 e) No magnetic anomalies were encountered during this survey.

S.2 Bottom samples were collected but not submitted to the Smithsonian Institution

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

T.1 Although the survey is of high quality, dredging took place after the MT MITCHELL survey detachment departed the area. It is recommended that only the soundings taken outside of the dredged area be used to update the charts. It is also recommended that a post-dredge survey be obtained after completion of the dredging contract and compared to MT MITCHELL results.

According to the Fort Eustis Harbormaster the dredging which took place after the MT MITCHELL survey only affected the "high spots" in the channel. MT MITCHELL data confirms locations of shallower water at the channel entrance, but cannot reliably state that dredging only affected this area.

T.2 Dredging may continue until the contract and controlling depths are obtained. As of mid-April 1994, Fort Eustis believes that the dredging has been completed. During the MT MITCHELL survey, verbal discussions with Naval Public Works indicated possible work until all contract amendments were satisfied which could be as late as December 1994.

T.3 Correspondence with Navy Public Works Center and acquisition of Public Works surveys is recommended. It may be appropriate for MT MITCHELL to return to this area in March 1995 to conduct a follow up hydrographic survey.

U. REFERRAL TO REPORTS

The following reports are included with the survey records:

Horizontal Control Report (Included with this survey)

Coast Pilot Report (Included with this survey)

SUBMITTAL SHEET
Survey H-10529

This descriptive report accurately describes all activities pertaining to the control, collection and processing of data for this survey, and is respectfully submitted by:



Ensign Michael P. Soracco, NOAA

APPENDIX I
Danger To Navigation Reports

No Danger to Navigation Reports were filed during this survey.

APPENDIX III
List of Horizontal Control Stations

1. List of Horizontal Control Stations.

Station EUSTIS

LAT: 37° 10' 17.80161" N

LONG: 076° 36' 07.24355" W

Ellipsoid Height: -31.4 meters

SOURCE: Established March 11, 1994

APPENDIX VI
Supplemental Correspondence

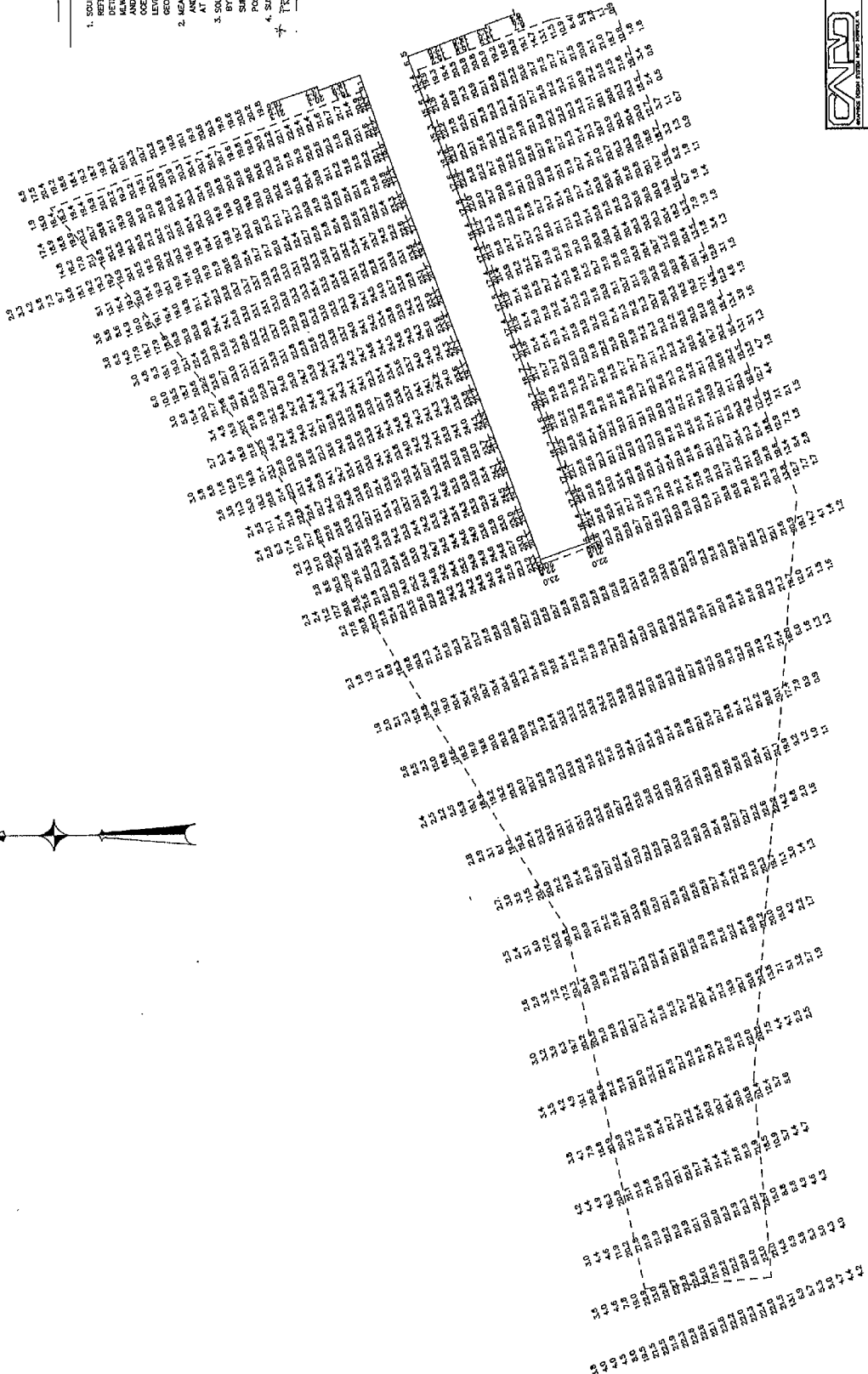
No written correspondence took place during the survey. A copy of the post-dredge survey has been attached.

NO.	REVISIONS	DATE	APPROVED BY

GENERAL NOTES

1. SOUNDINGS AND ELEVATIONS ARE IN FEET REFERRED TO MEAN LOW WATER (MLW) AS ESTABLISHED BY THE NATIONAL TIDE AND CURRENT SURVEY OFFICE AT BARNWELL BAY AND AT SCOTLAND WHARF BASED ON NATIONAL OCEAN SERVICE (NOS) TIDE OBSERVATIONS AND CE LEVING, WHICH IS 1.07 FEET BELOW THE MEAN LOW WATER OF THE TIDE GAGES. MEAN RANGE OF TIDE (MLR) AT BARNWELL BAY IS 2.2 FEET AT SCOTLAND WHARF AND 2.2 FEET AT SKIFFES CREEK BASED ON INTERPOLATED SURVEY DEPTH RECORDS USING CONVENTIONAL POSITIONING METHODS.
2. SURVEY WAS MADE 4 FEB - 18 FEB 1984.

* PRELIMINARY DRAWING



GRAPHIC SCALE



DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVY PUBLIC WORKS CENTER
NORTH CAROLINA
PORT EUSTON, VIRGINIA

**SKIFFES CREEK
AFTER DREDGE
SURVEY**

JOB ORDER NO. 1572-01-0000
SERIAL NO. 1572-01-0000-0001
SUBMITTED BY: [Name]
FROM MEMBER / PRINCIPAL
DYN. DIR. U.S. NAVY, U.S. FE
APPROVED: [Name]
DATE: [Date]

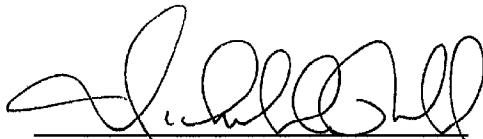
SIZE: 11x17 INCHES DRAWING NO. 1572-01-0000-0001
DRAWN BY: [Name]

APPENDIX VII
Approval Sheet

Letter of Approval

Registry No. H-10529

Field operations contributing to the accomplishment of this survey were conducted under my supervision with frequent personal checks of progress and adequacy. This report, final field sheets, and all accompanying data have been closely reviewed and are considered complete and adequate for updating the nautical chart.



Nicholas A. Prahl, Captain/NOAA
Commanding Officer
NOAA Ship MT MITCHELL

01/17/96

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H-10529

NUMBER OF CONTROL STATIONS	2
NUMBER OF POSITIONS	819
NUMBER OF SOUNDINGS	3463

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	15	06/09/94
VERIFICATION OF FIELD DATA	17	09/08/95
QUALITY CONTROL CHECKS	2	
EVALUATION AND ANALYSIS	10	
FINAL INSPECTION	5	12/01/95
COMPILATION	0	/ /
TOTAL TIME	49	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		12/11/95



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: June 7, 1994

MARINE CENTER: Atlantic

HYDROGRAPHIC PROJECT: S-E910-MI-94

HYDROGRAPHIC SHEET: H-10529

LOCALITY: Virginia, James River, Approaches and Basin, Fort Eustis,
Va.

TIME PERIOD: March 16 - 21, 1994

TIDE STATION USED: 863-8419 Fort Eustis, James River, Va.
Lat. $37^{\circ} 08.2'N$ Lon. $76^{\circ} 38.0'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 7.34 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.5 ft.

REMARKS: RECOMMENDED ZONING

Times and heights are direct on Fort Eustis, Va. (863-8419).

Note: Times are tabulated in Eastern Standard Time.

William M. Huber
CHIEF, DATUMS SECTION



\$8638419.494

ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H-10529 (1994)

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

D. AUTOMATED DATA ACQUISITION AND PROCESSING

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

Hydrographic Processing System (HPS)
AutoCAD, Release 12
NADCON, version 2.10

The smooth sheet was plotted using an ENCAD NovaJet III plotter.

H.1 CONTROL STATIONS

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83). Office processing of this survey is based on these values. The smooth sheet has been annotated with ticks showing the computed mean shift between the NAD 83 and the North American Datum of 1927 (NAD 27).

To place the smooth plots on the NAD 27, move the projection lines 0.528 seconds (16.262 meters or 3.25 mm at the scale of the survey) north in latitude and 1.164 seconds (28.699 meters or 5.74 mm at the scale of the survey) east in longitude.

M. COMPARISON WITH PRIOR SURVEYS

Hydrographic

H-7087 (1946-47) 1:10,000

The prior survey is adequately discussed in the corresponding section of the Descriptive Report.

O. COMPARISON WITH CHARTS 12248 (32nd Edition, Oct. 16/93)

The charted hydrography originates with prior surveys and unascertainable sources which require no further consideration.

The present survey is adequate to supersede the charted hydrography in the common area, except in the dredged channel.

O.3. CONTROLLING DEPTHS


The present survey was conducted while dredging operations were being performed. In the area where dredging was not completed the present survey depths are shoaler than the tabulated depths. Copies of after dredging drawings have been obtained from the Fifth District Headquarters, Facilities Engineering Command, Naval Station, Norfolk, Virginia and are included with the survey data.

P. ADEQUACY OF SURVEY

This is an adequate basic hydrographic survey; no additional work is recommended.

S. MISCELLANEOUS

Chart compilation using the present survey data was done by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compilation data will be forwarded to the Marine Chart Division, Silver Springs, Maryland.


Robert G. Roberson
Cartographer
Verification of Field Data
Evaluation and Analysis

APPROVAL SHEET
H-10529


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 magnetic tape record for this survey. A final sounding printouts of the survey has been made. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

 Date: 12/11/95

Norris A. Wike
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: December 11, 1995

Nicholas E. Perugini
Commander, NOAA
Chief, Atlantic Hydrographic Branch

Final Approval:

Approved:  Date: Jan 18, 1996

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

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10529

INSTRUCTIONS

1. A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
2. Letter all information.
3. In "Remarks" column cross out words that do not apply.
4. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
12248	2/13/96	M. Helton	Full Part Before After Marine Center Approval Signed Via
			Drawing No. 50
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
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			Full Part Before After Marine Center Approval Signed Via
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			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED