

9202

Diag. Cht. Nos. 1218-2 & 1219-2.

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT
(HYDROGRAPHIC)

Type of Survey Hydrographic
Field No. WH-20-2-71
Office No. H-9202

LOCALITY

State Delaware
General Locality Delaware Bay
Locality Harbor of Refuge to Fourteen
Foot Bank

19 71

CHIEF OF PARTY
C. H. Nixon

LIBRARY & ARCHIVES

DATE 6-17-74

9202

H-9202

HYDROGRAPHIC TITLE SHEET

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.

WH-20-2-71

State Delaware

General locality Delaware Bay

Still approved by R.H.C 3-10-75

Locality North of Harbor of Refuge to Fourteen Foot Bank

Scale 1:20,000

Date of survey ^{18 JD 169 252} June 18, 1971 to Sept. 9, 1971

Instructions dated May 25, July 1, August 5, 1971 Project No. OPR-192

2930 2931 2932

Vessel NOAA Ship WHITING, Launch I & II & NOAA Launch 1257

Chief of party CDR Charles H. Nixon, COMDG

CDR C.H. Nixon, LCDR K.F. Burke, LCDR J.D. Carpenter, LT P.L. Campbell

Surveyed by LTJG J.D. Busman, LTJG D.W. Yeager, LTJG R.C. Hoge, CST W.A. Hill

Soundings taken by echo sounder, hand lead, ~~***~~

Graphic record scaled by Ship personnel

Graphic record checked by Ship personnel

Protracted by ~~Computer Plotter System~~

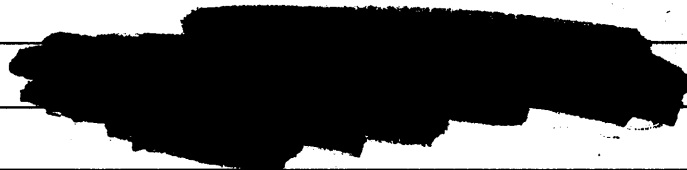
Automated plot by AMC Calcomp plotter No. 618
~~same~~

Soundings penciled by same

Soundings in ~~XXXX~~ feet at MLW ~~XXXX~~

REMARKS:

Broadkill River limiting depth 4.5 Ft



RWW 8/25/92

DESCRIPTIVE REPORT

To Accompany

Hydrographic Survey H-9202

WH 20-2-71

Scale 1:20,000

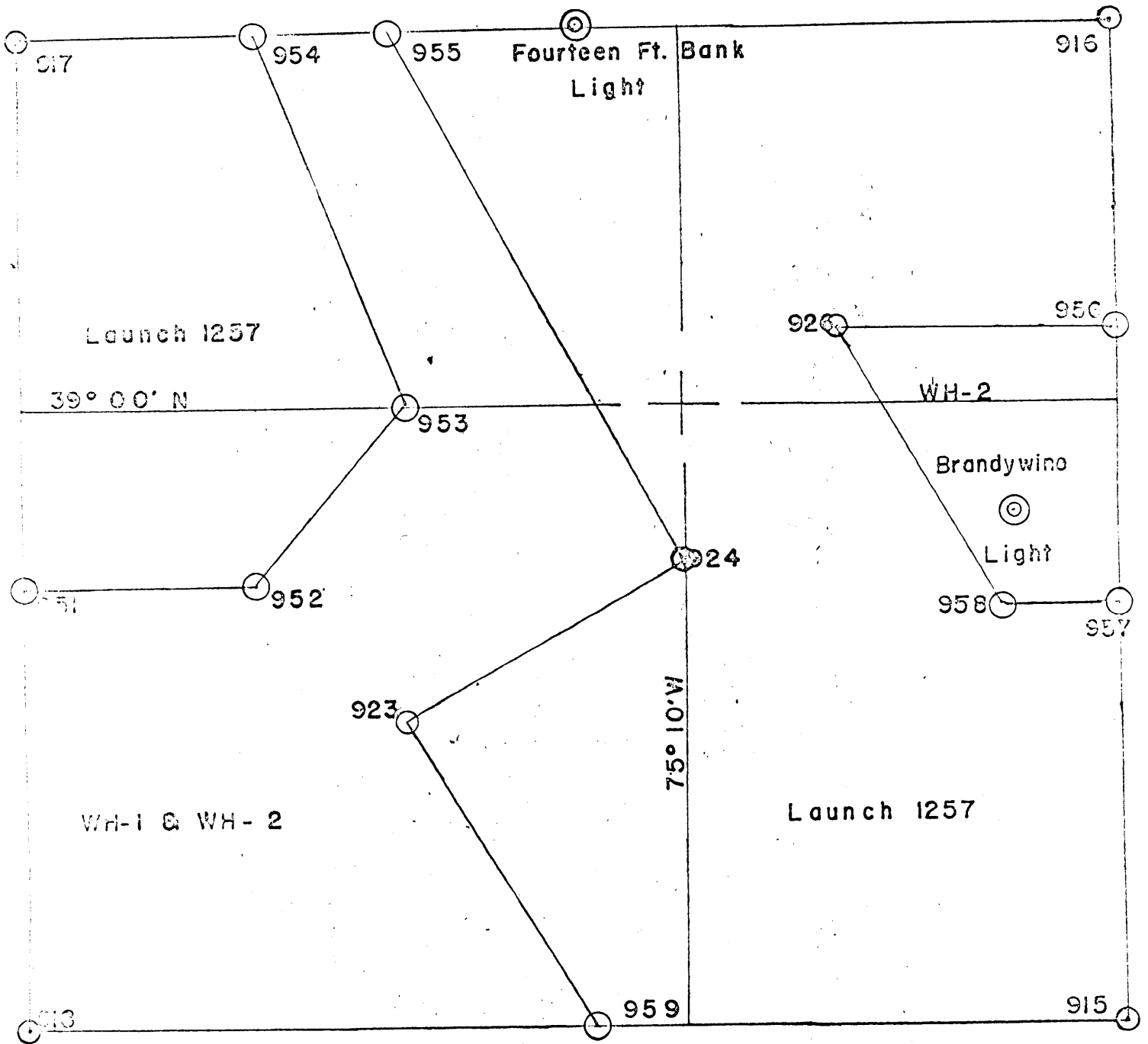
18 June 1971 to 9 September 1971

~~Coast of~~ Delaware *Bay*

OPR 492

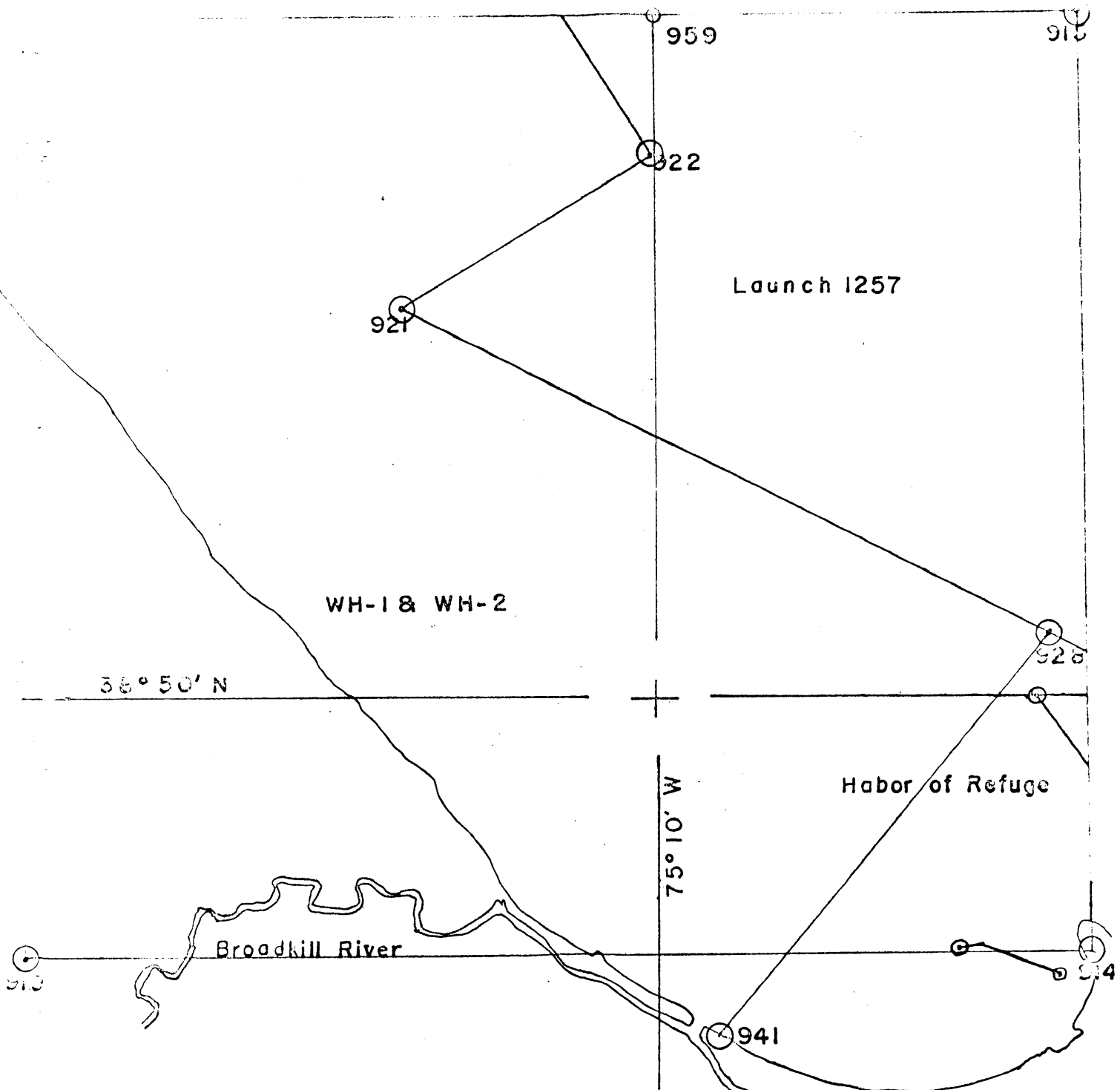
NOAA Ship WHITING

Charles H. Nixon, CDR, NOAA, Commanding

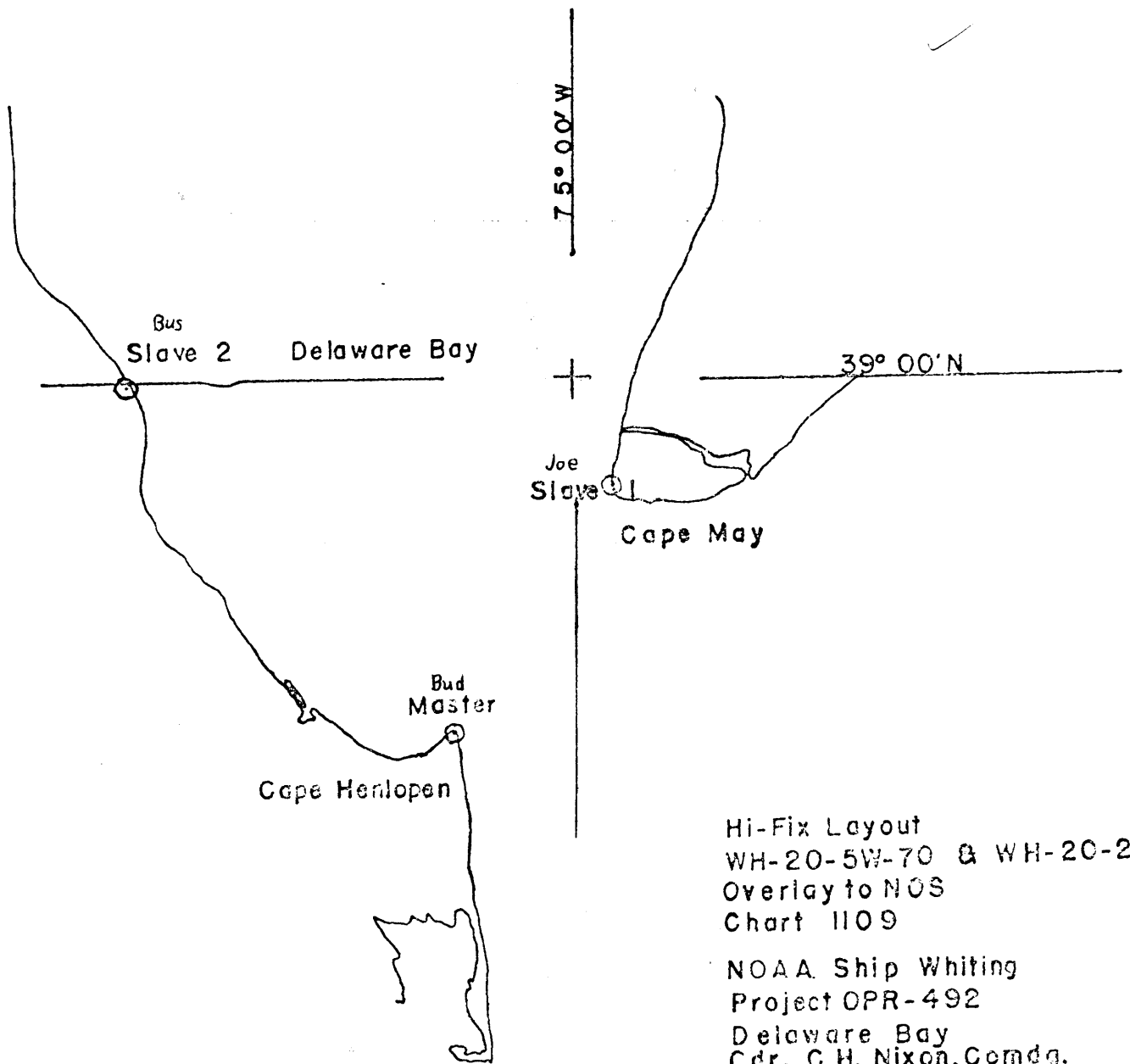


Boat Shoot Layout
 Plotter Sheet WH-20-2N-71
 Overlay to NOS Chart 1218

NOAA Ship Whiting
 Project OPR-492
 Delaware Bay
 Cdr. C.H. Nixon, Comdg.

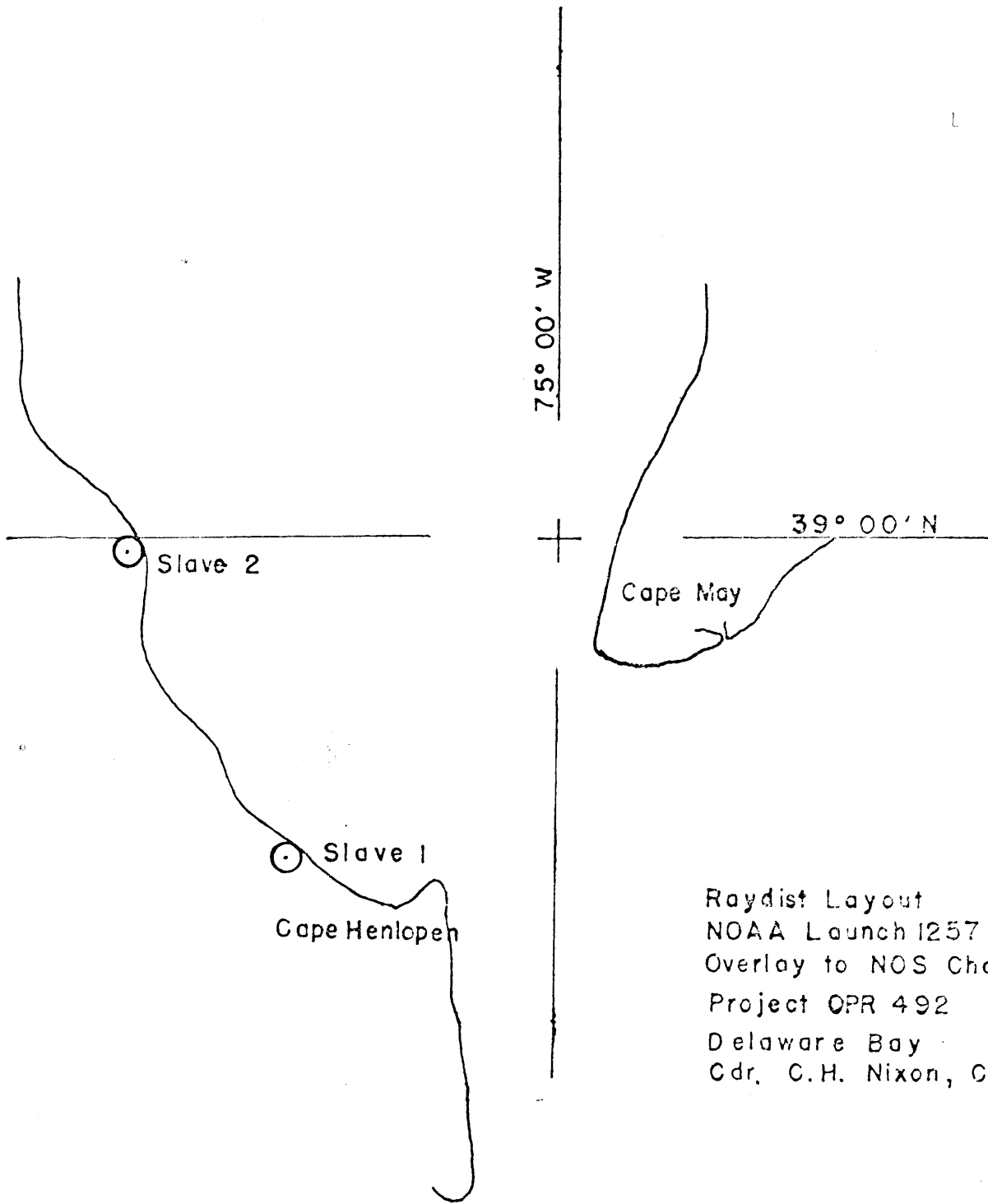


Bay Sheet Layout
 Plotter Sheet WH-20-2S-71
 Overlay To NOS Chart 1218
 NOAA Ship Whiting
 Project OPR-492
 Delaware Bay
 Dr. C.H. Nixon, Commaning Officer



Hi-Fix Layout
WH-20-5W-70 & WH-20-2-7
Overlay to NOS
Chart 1109

NOAA Ship Whiting
Project OPR-492
Delaware Bay
Cdr. C.H. Nixon, Comdg.



Raydist Layout
NOAA Launch 1257
Overlay to NOS Chart 1109
Project OPR 492
Delaware Bay
Cdr. C.H. Nixon, Comdg.

A. PROJECT:

The NOAA Ship WHITING accomplished this survey in accordance with the Project Instructions for OPR 492-WH-71, Delaware Bay, dated 25 May 1971, as amended 1 July and 5 August 1971.

B. AREA SURVEYED:

The area surveyed extended⁵ fifteen miles³ northward from the Harbor of Refuge, Lewes Delaware, to latitude $39^{\circ}04'N.$, near Fourteen Foot Bank Lighthouse. It extended⁵ seaward from the Delaware coastline, 16 miles, to longitude $75^{\circ}06'W.$ near Brandywine Shoal Lighthouse. In addition, a sounding line was run up the Broadkill River from Roosevelt Inlet to Milton, Delaware. The controlling depth was found to be 4.5 feet. The extent of the survey caused the boat sheet to be divided into two plotter sheets to accommodate the Calcomp Plotter. Two boatsheet layout sketches are included showing the plotter sheet locations, those areas done by NOAA Launch 1257, and those surveyed by WHITING launches WH-1 and WH-2.

This survey commenced on 18 June 1971 and was concluded on 9 September 1971.

C. SOUNDING VESSEL:

The sounding vessels were the NOAA Ship WHITING's launches WH-1 and WH-2, and NOAA Launch 1257.

D. SOUNDING EQUIPMENT:

Launch 1257 used Raytheon DE-723D survey fathometers number 1904 on all days except 193, 194, 195, 200 and 201 when she used number 37024. Launch 1, WH-1, used Raytheon DE-723D survey fathometer number 37019, while launch 2, WH-2, used Raytheon DE-723D survey fathometer number 37018.

Bar checks and leadline comparisons were taken daily in the working area as often as sea conditions permitted. The launch fathometer operators continually checked for proper initial settings, stylus arm length, sensitivity anomalies, and A-F scale comparisons. Nansen and TDC casts were made on the working grounds in water as deep as that encompassed during the survey as an additional source of sounding corrections.

Tide correctors based upon predicted tides at Breakwater Harbor were applied to all soundings on WH 20-2S-71. Soundings on WH 20-2N-71 used predicted tides for Brandywine Light for boat sheet plotted soundings.

Fathograms were scanned for any irregularities in trace, in addition to checks on proper depths. Ship personnel also made a second random sample check on fathogram scanning to insure all work was carried out properly.

E. SMOOTH SHEET:

The smooth sheet will be plotted on the computer plotter system at the Atlantic Marine Center, Norfolk, Virginia. ✓

The hydrography was conducted in such a fashion to complete the entire boatsheet WH 20-2-71. WH 20-2-71 is considered incomplete unless both WH 20-2S-71 and WH 20-2N-71 are finished. To this end, the final product should be WH 20-2-71 and will be when smooth plotted. It is not required that a line of hydrography be run two times at the junction of the north and south sheets, but only that the two joined together will complete the hydrography.

F. CONTROL:

The hydrography on the two plotter sheets was controlled electronically. The ship's launches, WH-1 and WH-2 used Hi-Fix in its hyperbolic mode. Launch 1257, however, used Raydist in the range-range mode. ✓

To begin the project the launches took numerous visual calibrations throughout the working area where visibility and good control existed. The purpose of this was to insure no land mass problems caused any Hi-Fix irregularities. Visual calibrations from Roosevelt Inlet showed no geographical change in Hi-Fix correctors. A line of shoreline was run with both visual fixes and Hi-Fix control. At the shoreline, the Hi-Fix correctors did not show any signs of variation from those further offshore.

The consistency of the Hi-Fix aided the hydrographer in many ways. By maneuvering his vessel to a known G. P., calibrations were accomplished at times of reduced visibility.

Launch hydro on WH 20-2S-71 used visual fixes to calibrate the Hi-Fix at least twice daily or anytime any reason to doubt the Hi-Fix arose. At times of reduced visibility, or when sea condition permitted, the G. P. calibration technique was employed.

Launch hydro on WH 20-2N-71 used mostly the G. P. technique type calibrations. The prevailing visibility, weather and working area conditions deemed this method the most feasible. The WH 20-2N-71 launch generally was not in an area where visual calibrations could be accomplished. A brush recorder was installed in this launch so complete assurance of valid Hi-Fix could be maintained while the launch did not make landfall.

Photogrammetric field party 62 located the Hi-Fix stations. Their locations follow:

HYPERBOLIC HI-FIX

<u>STATION</u>	<u>NAME</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>
Master	Bud	38°47'45.027"N.	75°05'33.290"W.
Slave I	HI-FIX JOE 1971	38°56'25.001"N.	74°58'16.975"W.
Slave 2	Bus	38°59'47.383"N.	75°19'32.554"W.

Frequency = 1779.6 ^{9 with} KHz ~~eps.~~

See Hi-Fix station layout sketch.

RANGE-RANGE RAYDIST

<u>STATION</u>	<u>NAME</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>
Slave I	Bayside Lab	38°47'27.39"N.	75°09'43.78"W.
Slave 2	Jim	38°59'45.62N.	75°19'31.40"W.

Frequency = 3296.495 ^{KHz} ~~eps.~~

See Raydist station layout sketch.

G. SHORLINE:

Shoreline was run only by ship's launches, WH-1 and WH-2 at various stages of tide. A complete zero depth curve was not obtained due to the range of tidal heights. The launches did, however, survey the six and twelve foot depth curves.

H. CROSSLINES:

Crossline mileage amounted to 10.0% of the main sounding system of lines. Crossline and main system lines showed excellent agreement. They checked to within one foot.

I. JUNCTIONS:

The boatsheet junctioned on the east with WH 20-5W-70, H-9153 scale 1:20,000. On the south the boatsheet junctioned with WH 10-1-70, H-9154 1:10,000 scale; it also junctioned with WH 10-2-71, H-9203 1:10,000 scale. Sounding agreements along the junctions of these other surveys were excellent, within 1 to 2 feet.

J. COMPARISON WITH PRIOR SURVEYS:

No comparison was made with prior surveys since they date 1880's. Comparisons made are with the chart.

PSR ITEMS AND SOUNDINGS

The 2 foot sounding at latitude $38^{\circ}51'10.00''$ N., longitude $75^{\circ}12'09.00''$ W.¹² was developed by WHITING launch personnel to 40 meter spacing in two directions. No evidence of a 2 foot sounding was found. A 4 foot sounding 400m east of the charted sounding was the shoalest found in the area. Discredited by the present survey, delete from chart. ✓

The 2 foot sounding at latitude $38^{\circ}52'20.00''$ N., longitude $75^{\circ}12'57.00''$ W.² was developed by WHITING launches to 90 meter spacing in one direction and 50 meters in another. The area was found to be 4 feet deep with a ³2 foot sounding found ~~200 meters east~~ ^{ENE} of the charted two foot sounding. Consult the present survey smooth sheet and revise the charted position. ✓

The 4 foot sounding at latitude $38^{\circ}52'20.00''$ N., longitude $75^{\circ}13'36.20''$ W.³ was found at latitude $38^{\circ}53'17''$ N., longitude $75^{\circ}13'27''$ W., ~~280 meters east~~ of the charted sounding. This 4' sounding was found by both basic sounding lines and special development lines. The area was developed at 40 meters to insure the shoalest depth was found. Numerous attempts to place a leadline on the peak were unsuccessful due to unfavorable current conditions. Revise charted position. ✓

Pre-Survey Review Item 12:

"The piles charted in latitude $38^{\circ}54'$ N., longitude $75^{\circ}16'$ W. originate with chart letter no. 239 of 1956 and were a bombing target established by the U. S. Navy. The target originally consisted of 16 piles around a circle of a 200 foot diameter with an inner set of 4 piles supporting a slatted pyramid. The outer set of piles were reported to extend 5 feet above MHW and the inner pyramid extended to 15 feet above MHW." ✓

The WHITING's launches determined that the bombing target had been destroyed.

The area was developed to 45 meter spacing with no indication of any piles. The pilings no longer bare at MLW. A drag search was not conducted. The least depth found was 12 feet in the area of the item.

It was not determined that the piles no longer exist. Therefore the hydrographer cannot recommend deletion of this item, but the chart should be revised to show that the piles no longer bare at MLW. Concur (presently charted as submerged piles)

The 5-foot sounding at latitude $38^{\circ}54'50''$ N., longitude $75^{\circ}15'45''$ W.³ was developed to 90 meter spacing by WHITING launch personnel. ~~Seveg~~ ^{Seveg} 7 foot soundings were located ~~200 meters west~~ ^{in the vicinity.} of the charted sounding. Disproved by the present survey, delete from chart. ✓

The 4 1/2-foot sounding at latitude $38^{\circ}55'01''$ N., longitude $75^{\circ}16'05''$ W. was developed to 90 meters by WHITING launch personnel and a ~~at~~ ^{we} 8 foot sounding was located at the charted position ~~southeast~~ ^{we} of Old Bare Shoal. ~~The area of Old~~ This 4 1/2 ft. sndg. is considered disproved by the present survey, delete from the chart. ✓

~~Bare Shoal is building to the southeast and the 8' sounding is indicative of the shoal's extension.~~ Comments on Old Bare Shoal are irrelevant to the charted 4½ ft. sndg.

The 8 foot sounding at latitude $38^{\circ}51'38''$ N., longitude $75^{\circ}10'18''$ W. was developed to 90 meters by WHITING launch personnel with an 8 foot sounding located ^{northwest} 300 meters ~~west~~ of the charted sounding. Considered discredited by the present survey. Revise chart accordingly. ✓

The 22 foot sounding at latitude $38^{\circ}50'55''$ N., longitude $75^{\circ}07'34''$ W. was developed to 90 meters by WHITING launch personnel with a ~~25~~²³⁻²⁴ foot sounding found at the charted position. Considered discredited by the present survey. Revise chart accordingly. ✓

The 13 foot sounding at latitude $38^{\circ}50'45''$ N., longitude $75^{\circ}08'17.0''$ W. was developed to 90 meters by WHITING launch personnel with a 14 foot sounding found ~~150~~²⁰⁰ meters due south of the charted sounding. Discredited by the present survey. Delete from chart. ✓

The 11 foot sounding at latitude $38^{\circ}50'40''$ N., longitude $75^{\circ}08'41''$ W. was developed to 90 meters by WHITING launch personnel with an 11 foot sounding found 300 meters west of the charted sounding. Considered discredited by the present survey. Delete from chart. ✓

The 7 foot sounding at latitude $38^{\circ}50'57''$ N., longitude $75^{\circ}09'18''$ W. was developed to 90 meters by WHITING launch personnel with a 10 foot sounding found ~~150~~¹⁸⁰ meters ~~south~~ of the charted sounding. The area was again developed in another direction to 40 meter spacing with no indication of a 7 foot sounding. Discredited by the present survey. Delete from chart. ✓

The 5 foot sounding at latitude $38^{\circ}50'57''$ N., longitude $75^{\circ}10'30''$ W. was developed to 45 meters with a 9 foot sounding found ^{SSW} 200 meters ~~south~~ of the charted sounding. Another development at 40 meter spacing in another direction showed no indication of a 5 foot sounding. Discredited by the present survey. Delete from chart. ✓

The 5 foot sounding at latitude $38^{\circ}50'25''$ N., longitude $75^{\circ}10'26''$ W. originated with H-1566 (1883) and was developed to 90 meters. The shoalest sounding found in the area was an 11 foot sounding 120 meters north of the charted sounding. The area was again developed to 40 meters in another direction with no indication of a 5 foot depth. This sndg. is not presently charted. It is discredited by the present survey. Do not chart. ✓

Pre-Survey Review Item 18.

Two visible wrecks:

(1) Latitude $38^{\circ}48'11''$ N., longitude $75^{\circ}10'29''$ W. originated from H-7034, 1945. The area was developed to 20 meter spacing with no indication of the wreck. The hydrographer cannot insure that the wreck is not submerged since a drag was not used. Concur (charted as a submerged wreck on current charts) ✓

(2) Latitude $38^{\circ}47'40''$ N., longitude $75^{\circ}09'58''$ W. originated from H-7034, 1945. The wreck was located by WHITING launch personnel, to be at latitude ~~$38^{\circ}47'36.5''$ N., longitude $75^{\circ}09'57.0''$ W.~~ The seaward extension of the wreck is located at position 321, latitude $38^{\circ}47'60''$ N., longitude $75^{\circ}09.90''$ W. The wreck has a total length of approximately 220 feet with 60 feet of it extending seaward of the MLW line. That part of the wreck seaward of the MLW line ~~bare 3 feet at MLW~~ is awash at MHW. Revise charted position to agree with the present smooth sheet. ✓

Disregard - considered ⁶ disproved

The 5 foot sounding at latitude $38^{\circ}50'48''$ ⁹⁴N., longitude $75^{\circ}10'30''$ ⁵⁰W, was not located. The shoalest depth found at that location was 9 feet. However, a 4 foot^{sndg.} was located by ship's personnel at latitude $38^{\circ}50.90'$ N., longitude $75^{\circ}11.95'$ W. ~~Disregard - considered to be a duplicate listing. (4 ft. sndg. is presently charted)~~

✓

The 16 foot sounding at latitude $38^{\circ}57'40''$ N., longitude $75^{\circ}13'05''$ W. was developed at 45 meter spacing by WHITING launch personnel. No indication of any shoaling from the regular bottom of 26 feet appears. It is recommended the sounding be removed from future charts. Superfluous listing (see listing at top of next page)

Disregard ✓

Pre-survey Review Item 10.

The sunken wreck charted at latitude $39^{\circ}00'13''$ ^{00.13"}N., longitude $75^{\circ}12'30''$ ^{12.30"}W. originated with chart letter no. 92 of 1925 and was the steamship MOHAWK which was beached and abandoned after a fire on board. The wreck was reported to lie in 6-8 feet of water at MLW with the forecstle head visible. The wreck was found to be at latitude $39^{\circ}00'16''$ ^{03.4"}N., longitude $75^{\circ}12'18''$ ^{18.4"}W. by WHITING launch personnel. The wreck was located with a detached position taken at each corner of the wreck on 229 day by launch 2, as recorded in the sounding volume. The visible portions of the wreck consist of two sets of standpipes approximately 20 feet apart, which bare 4 feet at mean low water based on predicted tides for the area. The wreck has been marked by a red nun buoy. at latitude $39^{\circ}00'08''$ N., longitude $75^{\circ}12'20''$ W. Concur

✓

The 18 foot sounding charted at latitude $38^{\circ}51'20''$ N., longitude $75^{\circ}07'50''$ W. was located by NOAA Launch 1257 during development of the area to 100 meters ^{with spacing} ~~to be 17 feet.~~ Fathograms have been checked to insure the shoalest sounding was found. 17 ft ^{sndg.} presently charted from the bath sheet of the present survey has been revised to 18 ft.

Revise chart to agree with the present survey ✓

The 18 foot sounding charted at latitude $38^{\circ}51'27''$ ^{27"}N., longitude $75^{\circ}08'29''$ ^{12"}W. was located by Launch 1257 while developing the area to 100 meter spacing. The fathograms were checked to insure that the shoalest sounding was found. This sounding was revised during subsequent processing. The present smooth sheet reveals 19 ft. depths in the vicinity

Pre-Survey Review Item 13.

The sunken wreck charted at latitude $38^{\circ}52.0'$ N., longitude $75^{\circ}07.9'$ W. Originates with Notice to Mariners No. 29 of 1951 and is the fishing vessel MARGARET reported sunk in 67 feet of water. No investigation of this wreck is necessary because it has been assigned for investigation by wire drag vessels RUDE and HECK. The current depth of this wreck at the above location was found to be 54 feet. Concur, retain on chart

✓

The 62 foot sounding at latitude $38^{\circ}53'14''$ ³N., longitude $75^{\circ}06'20''$ ⁴W. was developed by Launch 1257 to 100 meter spacing. The shoalest sounding found was ~~63~~⁵⁹ feet. Delete 62 and chart the 59 ft. ^{sndg.} from the present survey.

✓

The 45 foot sounding charted at latitude $38^{\circ}54'50''$ ⁵N., longitude $75^{\circ}08'50''$ ⁵W. was developed by Launch 1257 to 100 meter spacing. The shoalest sounding in the area is ~~57~~⁴⁶ feet. Disregard (This 45 ft. sounding has been deleted from the chart.)

✓

The 16 foot sounding ^{charted} at latitude $38^{\circ}57'40''$ ⁵N., longitude $75^{\circ}13'05''$ ¹⁰W. was developed by WHITING launches to 50 meter spacing. No indication of any shoal was found. The hydrography of the general vicinity shows a controlling depth of 26 feet. The hydrographer recommends the deletion of the charted 16 foot depth. Concur

Pre-Survey Review Item 11.

The sunken wreck PA charted at latitude $38^{\circ}56.59'N.$, longitude $75^{\circ}10.14'W.$ originated with Notice to Mariners No. 18 of 1954 and was a 66 foot fishing vessel with a 65 foot mast reported sunk in 80 feet of water about 7,400 yards approximately 225° from Brandywine Shoal Light. The position given was approximate. No investigation of this wreck was made because it has been assigned for investigation by wire drag vessels RUDE and HECK. The current depth of this location was found to be 110° feet. Retain on chart

From bp 37642 (1943)
The 31 foot sounding at latitude $38^{\circ}56'10''$ ²N., longitude $75^{\circ}06'10''W.$ was developed by NOAA Launch 1257 to 100 meters. A 31° foot sounding was the shoalest one found in the ^{vicinity} ~~charted position~~. Disproved by present survey, delete from chart.

The 32 foot sounding at latitude $38^{\circ}56'05''N.$, longitude $75^{\circ}05'50''W.$ was developed by Launch 1257 to 100 meters. A 32° foot sounding was found 200 meters southwest of the charted ^{one} position. Disregard (This sndg. has been deleted from the chart.)

From bp 37642 (1943)
The 30 foot sounding charted at latitude $39^{\circ}00'40''$ ⁴³N., longitude $75^{\circ}08'35''W.$ was developed by Launch 1257 to 100 meters. Some 32 foot soundings were found 200 meters ^{south} southeast of the charted 30. Disproved by present survey, delete from chart.

From H-1476 a (1880)
The 30 foot sounding at latitude $39^{\circ}01'10''N.$, longitude $75^{\circ}08'50''W.$ was not found by Launch 1257 after development of the area to 100 meter spacing. The bottom in the general area is 32° feet deep with a 20° foot sounding found 200 meters southeast of the charted 30. Disproved, delete from chart.

From H-1476 a (1880)
The 29 foot sounding charted at latitude $39^{\circ}01'40''N.$, longitude $75^{\circ}09'50''$ ⁰⁶W. was ^{not} found to be a 29 when developed to 100 meter spacing by Launch 1257. ^{A 29 was found} 150 meters east of the charted position. Revise charted position.

Pre-Survey Review Item 8.

The 30-foot sounding RK charted in latitude $39^{\circ}02.72'N.$, longitude $75^{\circ}10.34'W.$ originated with Chart Letter No. 653 of 1937 and consisted of 500 tons of stone dumped inadvertently when a barge capsized. The Corps of Engineers reported the rock pile to be 1300 yards 108° true from Fourteen Foot Bank Light, with a depth over it of 30 feet in 35-36 feet of water. The rock-pile was to be located and a least depth determined. The general vicinity was developed by Launch 1257 to 100 meter spacing. The area has shoaled to 29-30 feet. This is a building to the southeast of JOE FLOGGER SHOAL. The rocks apparently caused a sediment build up near them and the area is now shoaler than in 1957. The rocks are no longer ^{any} specific hazardous to navigation since the areas controlling depth has changed to a depth more shallow than that of the rocks. The present survey does not disprove this feature. It should be retained on the chart

charted from bp 36406(1942)

The 22 foot sounding charted at latitude $39^{\circ}01'30''N.$, longitude $75^{\circ}10'45''W.$ was developed by Launch 1257 to 100 meter spacing. ~~A 23 foot sounding was found 300 meters south of the charted 22. It was not found or disproved and should be retained on the~~ *Disregard, area adequately developed on present survey, chart*

The 19 foot sounding charted at latitude $39^{\circ}02'40''N.$, longitude $75^{\circ}14'20''W.$ was developed by Launch 1257 to 100 meter spacing. The general area has shoaled appreciably and a new representative depth for the area is $9-10^5$ feet. *Concur*

The 22 foot sounding at latitude $39^{\circ}02'00''N.$, longitude $75^{\circ}13'55''W.$ was developed by Launch 1257 to 100 meter spacing. The shoalest depth in the area is 19^{23} feet, which is northwest of the charted sounding. ~~This again could represent a moving of the shoal in a southeast direction.~~ *Concur, delete 22*

The 6 foot sounding at latitude $39^{\circ}02'10''N.$, longitude $75^{\circ}13'20''W.$ was developed by WHITING launch personnel to 50 meter spacing. The shoalest sounding found was a 7 at the charted 6. Launch 1257 also developed the area to 50 meter spacing. This development was in a different direction from that of the WHITING launches. Launch 1257 determined a shoal depth of 8 feet. *Delete charted 6 ft. sndg.*

The 6 foot sounding charted at latitude $39^{\circ}02'15''N.$, longitude $75^{\circ}13'10''W.$ was developed by WHITING launch personnel to 50 meter spacing. The shoalest found was 9 feet. Launch 1257 also developed the area to 50 meter spacing. This development was in another direction to insure complete coverage of the area. The shoalest depth Launch 1257 found was 9 feet. *Concur, delete charted 6 ft. sndg.*

The 6 foot sounding charted at latitude $39^{\circ}02'35''N.$, longitude $75^{\circ}13'25''W.$ was developed by WHITING launch personnel to 50 meter spacing. The shoalest sounding found in the immediate vicinity is 12 feet. Launch 1257 developed the area to 50 meter spacing in another direction to insure complete area coverage. The shoalest sounding found was 12 feet. This northwest portion of the Lower Middle Shoal appears to be scouring appreciably and moving in a southeast direction. *Concur*

WHITING launch 1 located a wreck at latitude $38^{\circ}52'11''N.$, longitude $75^{\circ}09'28''W.$ The wreck was located at the same position on three separate occasions. A lead-line was put on the wreck on 230 day by U. S. Navy Reserve divers. The lead-line depth reduced to 15.8 feet at MLW using predicted tides. A Local Notice to Mariners was issued by the WHITING since the wreck is not charted and is in 25 feet of water. Launch hydro development of the area by echo sounder insured the least depth was found. It's least depth reduced to 15.9 feet using predicted tides. *(least depth subsequently revised to 15 ft.)*

In addition, Launch 1257 investigated the area and excellent agreement was attained both with the position and least depth of the wreck.

K. COMPARISON WITH THE CHART:

Comparison with NOS chart 1218 indicates a trend of seaward movement of shoals. The shoals appear to be scouring on their northwest portions and building in

the southeast part. In general there appears to be a seaward ^{progression} ~~transportation~~ of the bottom configuration.

A new buoy R"WRTA" quick flashing red, was established on NOS chart 1218, 17th edition, October 10, 1970, at latitude $38^{\circ}57'41''N.$, longitude $75^{\circ}11'58''W.$ This buoy was installed to designate a sunken barge 50 yards, 061° from the buoy (Notice to Mariners 71-16-1417), with a least depth of 50 feet. *Not presently charted*

The buoy was located by WH-2 at latitude $38^{\circ}57'58''N.$, longitude $75^{\circ}11'43''W.$ The wreck currently lies 150 yards southwest of the buoy at latitude $38^{\circ}57'58''N.$, longitude $75^{\circ}11'58''W.$ Since this buoy is currently on the wrong side of the wreck, thereby creating a danger to navigation, the Army Corps of Engineers were notified of the danger. The least depth determined by the launch was ~~still~~ 50^2 feet. Divers were unavailable to investigate it.

Mr. Robert Spies, from the Corps of Engineers, Philadelphia, Pennsylvania, telephone number 215-597-4745 was contacted concerning this matter. A Corps Notice to Mariners from 28 June noted a new position of the WRTA buoy and this agreed excellently with that presented by the WHITING. Mr. Spies also reported that a contract was let in November, 1971 for removal of the wreck from the bottom.

The hydrographer recommends that before a chart revision is made, Mr. Spies should be contacted to see that the wreck was removed, which would necessitate the removal of the buoy. At the time the WHITING left the work area, the removal had not been done. *The buoy and wreck were subsequently deleted from the chart*

A tower formerly located at latitude $38^{\circ}58.8'N.$, longitude $75^{\circ}16.1'W.$ northwest of Prime Hook Beach has been removed. ~~See C&GS form 567 in appendix.~~ The hydrographer recommends deletion of this landmark from the charts. *Concur*

The Brandywine Range channel was surveyed by Launch 1257 and hydrography showed the controlling depth to be 40 feet as is currently charted.

The area at latitude $38^{\circ}59.8'N.$, longitude $75^{\circ}10.6'W.$ has a prominent rough bottom characteristic. The chart would indicate the bottom to be 39'. Launch 1257 and WH-2 lines joined there and show a controlling depth of 39'-40' but "deeps" to as much as 47'.

L. ADEQUACY OF THE SURVEY:

The survey is complete and adequate to supersede all prior surveys for charting purposes.

M. AIDS TO NAVIGATION:

The following floating aids to navigation were located within the area surveyed by WH-1, WH-2, and Launch 1257 on WH 20-2-71:

<u>CHARTED NAME</u>	<u>DESCRIPTION</u>	<u>CHARTED POSITION</u>	<u>ACTUAL POSITION</u>
Brandywine Shoal Upper Buoy	Red and Black Nun	Lat. 39°01'26"N. Long. 75°08'06"W.	Lat. 39°01'27"N. Long. 75°08'11"W.



Buoy located on 216 day by Launch 1257.

Brandywine Shoal Lower Buoy	Red and Black Nun	Lat. 38°58'31"N. Long. 75°06'18"W.	Lat. 38°58' ² 38"N. Long. 75°06'22 ^{18"} W.
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Buoy located on 204 day by WH-2.

Brandywine Shoal Midway Buoy "2"	Red, Nun	Lat. 38°59'48"N. Long. 75°07'40"W.	Lat. 38°59' ³ 48"N. Long. 75°07'40 ⁵ W.
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Buoy located on 203 day by WH-2.

Lighted Bell Buoy "16"	Red, Fl. 4 sec. Bell	Lat. 39°02'08"N. Long. 75°09'25"W.	Lat. 39°02'09"N. Long. 75°09'27 ⁸ W.
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Buoy located on 221 day by Launch 1257.

Lighted Buoy "14"	Red, Fl.R. 2.5 sec.	Lat. 39°00'19"N. Long. 75°08'25"W.	Lat. 39°00' ¹ 22"N. Long. 75°08'28 ³⁰ W.
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Buoy located on 221 day by Launch 1257.

Lighted Bell Buoy "12"	Red, Fl.R. 4 sec.	Lat. 38°58'52"N. Long. 75°07'40"W.	Lat. 38°58'52"N. Long. 75°07'41 ² W.
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Buoy located on 221 day by Launch 1257.

Lighted Buoy "10"	Red, Fl.R. 4 sec.	Lat. 38°56'22"N. Long. 75°06'18"W.	Lat. 38°56'23"N. Long. 75°06'19"W.
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Buoy located on 221 day by Launch 1257.

Lighted Buoy "9"	Black, Fl. 2.5 sec. Bell, Radar Reflector	Lat. 38°55'19"N. Lat. 38°55'21"N. ✓ Long. 75°06'04"W. Long. 75°06'02"W.
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Buoy located on 218 day by Launch 1257.

Tanker Anchorage Approach Lighted Buoy	Black and White Mo (A)	Lat. 38°53'54"N. Lat. 38°53'59"N. ✓ Long. 75°08'00"W. Long. 75°08'00"W. 7 58
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Buoy located on 218 day by Launch 1257.

The Lower Middle Buoy	Red and Black Can	Lat. 38°58'16"N. Lat. 38°58'15"N. ✓ Long. 75°10'31"W. Long. 75°10'31"W. 3
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Buoy located on ²²¹~~227~~ day by ^{Launch 1257}~~WH-2~~.

"WRTA" WR-TA	Red. Qu. Fl.	Lat. 38°57'41"N. Lat. 38°57'58"N. ✓ Long. 75°11'58"W. Long. 75°11'48"W. 5
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Buoy located on 221 day by Launch 1257.

Tanker Anchorage Lighted Buoy "A"	White, Fl. 4 sec.	Lat. 38°57'13"N. Lat. 38°57'17"N. ✓ Long. 75°12'14"W. Long. 75°12'13"W. 15"
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Buoy located on ²²¹~~230~~ day by ^{Launch 1257}~~WH-2~~.

Tanker Anchorage Lighted Buoy "C"	White, Fl. 4 sec.	Lat. 38°59'21"N. Lat. 38°59'21"N. ✓ Long. 75°13'48"W. Long. 75°13'48"W. 50"
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Buoy located on 222 day by Launch 1257.

Tanker Anchorage Buoy "B"	White, Nun	Lat. 38°59'52"N. Lat. 38°59'52"N. ✓ Long. 75°12'42"W. Long. 75°12'43"W.
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Buoy located on ²⁵⁸~~222~~ day by ^{Launch 1257}~~WH-2~~.

Lower Middle Wreck Buoy "LMW"	Red, Nun Radar Reflector	Lat. 39°00'10"N. Long. 75°12'24"W.	Lat. 39°00'08"N. Long. 75°12'20"W.	✓
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Buoy located on 229 day by WH-2.

Channel Crossing Buoy "1"	Black, Can	Lat. 39°03'11"N. Long. 75°14'26"W.	Lat. 39°02'35"N. Long. 75°14'13"W.	✓
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Buoy located on 258 day by Launch 1257.

Channel Crossing Buoy 2	Red Nun	Lat. 39° 03' 19" N. Long. 75° 13' 52" W.	Lat. 39° 02' 46" N. Long. 75° 13' 41" W.	✓
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Mispillion Shoal Point Buoy "1"	Black, Can	Lat. 38°57'51"N. Long. 75°13'37"W.	Lat. 38°57' ^{54"} 48"N. Long. 75°13' ^{26"} 26"W.	✓
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Buoy located on ²³⁰~~222~~ day by WH-2.

Cedar Beach Buoy "3"	Black, Can	Lat. 38°57'24"N. Long. 75°15'50"W.	Lat. 38°57' ⁸ 38"N. Long. 75°15' ³⁴ 48"W.	✓
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Buoy located on 229 day by WH-2.

Old Bare Shoal Buoy "A" "A"	Black and White Nun	Lat. 38°53'59"N. Long. 75°12'23"W.	Lat. 38°54' ³² 48"N. Long. 75°12' ²² 35"W.	✓
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Buoy located on 227 day by WH-1.

Old Bare Shoal Buoy "A" "B"	Black and White Nun	Lat. 38°55'51"N. Long. 75°13'54"W.	Lat. 38°55'43"N. Long. 74°14'07"W.	✓
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Buoy located on ~~244~~ day by ~~Launch 1257.~~
²³⁰ WH-2

All of the above buoys adequately serve the purpose for which they were established, with the exception of "WRTA" which was discussed in section L. Channel Crossing Buoy 1, Black, Can, was moved during survey operations approximately one half mile south of its charted position. The Aids to Navigation Office, 3rd Coast Guard District, Governors Island, N. Y. was notified of the discrepancy. See section 7-C of the Review.

The above buoys were located when possible using a three point fix and check angle. However, due to the poor visibility offshore, most of the locations were made using electronic control.

N. STATISTICS:

<u>SOUNDING VESSEL</u>	<u>MILES OF SOUNDING LINES</u>	<u>NUMBER OF BOTTOM SAMPLES</u>	<u>NO. OF POSITIONS</u>	<u>NUMBER OF DETACHED POSITIONS</u>
Launch 1	733.3	139	7441	12
Launch 2	898.7	101		1
Launch 1257	<u>832.5</u>	<u>45</u>	<u>3342</u>	<u>14</u>
TOTALS	2,464.5	285	10,783	27

Area surveyed = 105.5 square miles

Percentage of crosslines = 10.5%

O. REFERENCE TO REPORTS:

1. OPR 492 Fathometer Report
2. OPR 492 Hi-Fix Report
3. Velocity tables
- ~~4. C&GS Form 567 Form not included in this D.R.~~

LIST OF TRIANGULATION

	LAT.	LONG.
100 ROOSEVELT INLET N. JETTY LT., 1962	38° 47' 39.872"	75° 09' 28.735" ✓
1001 ROOSEVELT INLET S. JETTY LT., 1962	38° 47' 37.203"	75° 09' 23.455" ✓
1002 HARBOR OF REFUGE } See note below N. END LT., 1933-70	38° 49' 57.052"	75° 06' 22.210"
1003 HARBOR OF REFUGE L.H. (NEW), 1927-62	38° 48' 51.827"	75° 05' 33.975" ✓
1004 DELAWARE BREAKWATER W. END LT., 1933-62	38° 48' 01.380"	75° 07' 01.269" ✓
1005 DELAWARE BREAKWATER LIGHTHOUSE, 1927-62	38° 47' 49.215"	75° 06' 01.243" ✓
1006 BRANDYWINE SHOALS LIGHTHOUSE, 1932	38° 59' 10.030"	75° 06' 48.818" ✓
1007 FOURTEEN FOOT BANK LT., 1933	39° 02' 53.294"	75° 10' 57.273" ✓

Re signal 102 above: Geodesy has no record of this station established in 1970

TIDE NOTE

Smooth tides for WH 20-2-71 were obtained from the standard tide gage at Lewes, Delaware, latitude $38^{\circ} 47.1$ N, longitude $75^{\circ} 07.0$ W.

Mean low water on the staff was determined to be 2.5 feet by the Tides Division, Rockville, Maryland.

WHITING personnel logged the smooth tide hourly heights furnished by Rockville; and submitted these tapes to AMC with the rest of the data.

The time meridian was 0° west, Greenwich Mean Time.

All soundings on the WHITING launch sheets are based on predicted tides for Breakwater Harbor. Soundings for Launch 1257 used predicted tides for Brandywine Shoal Light.

GEOGRAPHIC NAME LIST

1. Brandywine Shoal ✓
2. Broadkill Beach ✓
3. ~~Broadkill Inlet~~
4. Brown Shoal ✓
5. Fowler Beach ✓
6. Old Bare Shoal ✓
7. Primehook Beach ✓
8. Roosevelt Inlet ✓
9. The Lower Middle ~~Shoal~~
10. The Shears ✓
11. Delaware Bay ✓
12. Hawknest ✓
13. Harbor of Refuge
14. Fourteen Foot Bank

APPROVAL SHEET

Submitted by: *Robert C. Hoge*

Robert Hoge
LTJG, NOAA

Supervision of field and office work on this hydrographic survey was continuous on a day to day basis to insure completeness of the survey and to insure that the work was in accordance with instructions.

Hydrography completed on this boat sheet is complete and adequate to supersede prior surveys for charting.

Approved and Forwarded:

Charles H. Nixon
Charles H. Nixon
CDR, NOAA

2-22-71

ATLANTIC MARINE CENTER

ELECTRONIC CONTROL PARAMETERS

1. Project # OPR- 492 2. Reg. # H-9202 3. Field # WH 20-2-71
 4. Type of Control: Hyperbolic Hi-Fix and Raydist (Range-Range) (Hi-Fix, Raydist, EPI, etc)
 5. Frequency 1779.6 cps/KHz (for conversion of electronic lanes to meters)
 6. Mode of Operation (check one):

Range-Range Raydist 3296.495 KHz Range-Visual

Launch	Range One (R ₁) Station I.D.	<u>Bayside Lab</u>	Lat.	<u>38</u> °	<u>47</u>	<u>'27.39N</u>
	Range Two (R ₂) Station I.D.	<u>Jim</u>	Long.	<u>75</u> °	<u>09</u>	<u>'43.78W</u>
1257			Lat.	<u>38</u> °	<u>59</u>	<u>'45.62N</u>
			Long.	<u>75</u> °	<u>19</u>	<u>'31.40W</u>

Hyperbolic (3-station) Hyper-Visual

WH 1	Slave One Station I.D.	<u>Bud Hi-Fix Joe 1971</u>	Lat.	<u>38</u> °	<u>47</u>	<u>'45.027N</u>
WH 2	Master Station I.D.	<u>Hi-Fix Joe 1971 Bud</u>	Long.	<u>75</u> °	<u>05</u>	<u>'33.290W</u>
	Slave Two Station I.D.	<u>Bus</u>	Lat.	<u>38</u> °	<u>56</u>	<u>'25.001N</u>
			Long.	<u>74</u> °	<u>58</u>	<u>'16.975W</u>
			Lat.	<u>38</u> °	<u>59</u>	<u>'47.383N</u>
			Long.	<u>75</u> °	<u>19</u>	<u>'32.554W</u>

7. Location of Survey:

^{Raydist} Range-Range Imagine an observer is standing at R₁ Station and looking directly at R₂ (check one):

Survey area is to observer's Right A=0

Survey area is to observer's Left A=1

^{Hi-Fix} Hyperbolic Looking from survey area toward Master Station:

Slave One must be to observer's Left;

Slave Two must be to observer's Right.

8. This form is submitted as an aid in preparing a boat sheet.

This form applies to all data on this survey.

This form applies to part of the data on this survey.

Vessel EDP #	From Time Day	To Time Day	Position Number (inclusive)
_____	_____	_____	_____ to _____
_____	_____	_____	_____ to _____
_____	_____	_____	_____ to _____

9. Remarks.

SHEET LAYOUT POINTS

- 915) 38/55/18 N.
75/05/45 W.
- 916) 39/02/54 N.
75/05/42 W.
- 917) 39/02/54 N.
75/16/18 W.
- 918) 38/55/18 N.
75/16/18 W.
- 923) 38/57/36 N.
75/12/39 W.
- 924) 38/58/51 N.
75/10/00 W.
- 926) 39/00/36 N.
75/08/30 W.
- 951) 38/58/36 N.
75/16/24 W.
- 952) 38/58/36 N.
75/14/08 W.
- 953) 39/00/00 N.
75/12/42 W.
- 954) 39/02/47 N.
75/14/05 W.
- 955) 39/02/54 N.
75/12/52 W.
- 956) 39/00/40 N.
75/05/53 W.
- 957) 38/58/30 N.
75/05/53 W.
- 958) 38/58/30 N.
75/06/57 W.
- 959) 38/55/21 N.
75/10/54 W.

Plotter Sheet WH-20-2S-71

SHEET LAYOUT POINTS

941) 38/47/21 N.
75/09/27 W.

919) 38/48/00 N.
75/10/18 W.

914) 38/48/12 N.
75/05/45 W.

928) 38/58/30 N.
75/05/42 W.

921) 38/53/00 N.
75/12/30 W.

922) 38/54/12 N.
75/10/00 W.

915) 38/55/18 N.
75/05/45 W.

918) 38/55/18 N.
75/10/18 W.

959) 38/55/21 N.
75/10/54 W.

SIGNAL TAPE WH 20-2-71

OPR 492

350 38 46 0794 075 05 1224

356 38 46 5355 075 07 0011

358 38 47 4922 075 06 0124

359 38 47 3872 075 05 3047 ?

360 38 48 0138 075 07 0127

362 38 48 5183 075 05 3398

364 38 49 5688 075 06 2200 (signal no 500 on H-9154 (1970))

372 38 46 1886 075 08 1144

374 38 46 3109 075 08 2794

376 38 47 3720 075 09 2345

378 38 47 3987 075 09 2874

400 38 47 2834 075 09 4501

404 38 47 3893 075 10 0367

408 38 47 5645 075 10 3609

412 38 48 0463 075 10 5572

416 38 48 1550 075 11 1528

418 38 48 3490 075 12 4210

420 38 48 3729 075 11 3910

444 38 49 4032 075 12 4644

448 38 49 5303 075 13 0016

452 38 50 0261 075 13 2185

456 38 50 1849 075 13 3347

460 38 50 3052 075 13 4828

472	38 51 1075	075 14 2981
476	38 51 2323	075 14 4129
480	38 51 3893	075 14 5537
484	38 51 5364	075 15 0699
488	38 52 0179	075 15 1314
492	38 52 1431	075 15 2324
496	38 52 2426	075 15 3234
500	38 52 3749	075 15 5044
504	38 52 5189	075 16 0908
508	38 53 2048	075 16 3981
512	38 53 3572	075 16 5646
516	38 53 5161	075 17 1360
520	38 54 1422	075 17 4020
524	38 54 2768	075 17 5508
528	38 54 4592	075 18 1532
532	38 55 1049	075 18 3435
536	38 55 2006	075 18 4250
540	38 55 2872	075 18 5124
544	38 55 3725	075 18 5702
548	38 55 4741	075 19 0394
551	38 56 0082	075 19 0368
552	38 55 5902	075 19 0662
556	38 56 0502	075 19 2542
560	38 56 0615	075 19 0477
570	38 56 5049	075 18 5368
572	38 56 1124	075 17 5468
580	39 00 0074	075 19 4396
612	38 57 0891	075 18 4503
614	38 57 1859	075 18 4450
616	38 57 2865	075 18 4357
618	38 57 4407	075 18 4100

622
626 38 58 3328 075 18 5086
628 38 58 4949 075 18 5435
32 38 59 0891 075 19 0438
750 38 56 1356 074 54 5599
751 38 56 4053 074 54 2234
753 38 56 4691 074 53 3541
754 38 56 4908 074 53 1119
755 38 56 5807 074 52 0247
756 38 55 5838 074 57 3876
757 38 59 1003 075 06 4882
758 39 02 5329 075 10 5727
760 39 00 1367 074 54 3936
816 38 56 3590 074 58 0256
817 38 56 4069 074 57 5568
818 38 56 4040 074 57 5477
819 38 56 3990 074 57 5452
823 38 56 4344 074 58 0108
825 38 57 5661 074 58 0196
826 38 58 0322 074 58 0114
827 38 58 1068 074 57 4316
829 38 58 2484 074 57 2795
833 38 58 5370 074 57 1176

MI-20-2-71

II-9202

DAY	P I	P II	DAY	P I	P II
169	+0.40	+0.34	225	+0.42	+0.44
172	+0.48	+0.37	226	+0.41	+0.48
175	+0.38	+0.31	227	+0.43	+0.45
180	+0.48	+0.31	228	+0.46	+0.47
181	-0.23	0.00	229	+0.42	+0.46
182	-0.32 ²⁶	+0.42 ²⁷	230	+0.42	+0.46
189	+0.39	+0.43	231	+0.40	+0.46
190	+0.38	+0.41	232	+0.42	+0.46
191	+0.38	+0.30	234	+0.38	+0.41
193	+0.39	+0.43	235	+0.39	+0.41
194	+0.39	+0.37	243	NO MI-FIX	
196	+0.40	+0.40			
197	+0.38 ⁴⁰	+0.33 ⁴⁰			
198	+0.45 ⁴⁰	+0.45 ⁴⁰			
199	+0.40	+0.40 [✓]			
200	+0.40	+0.40 [✓]			
201	+0.45 ⁰	+0.43 ³			
202	+0.45	+0.47			
203	+0.44	+0.48			
204	+0.44	+0.50			
205	+0.44	+0.46			
206	+0.44	+0.43			
207	+0.43	+0.47			
208	+0.43 ⁴³	+0.35 ⁴⁷			
209	+0.35	+0.35			
210	+0.45	+0.44			
211	+0.46	+0.46			
212	+0.44	+0.44			
213	+0.46	+0.47			
215	+0.46	+0.44			
216	+0.49	+0.48			
218	+0.45	+0.44			
219	+0.44	+0.46			
220	+0.46	+0.41			
221	+0.45	+0.46			
222	+0.43	+0.47			
223	+0.42	+0.44			

CALIBRATION ABSTRACT

WHITING LAUNCH I

WH-20-2-71

H-9202

DAY	P I	P II	DAY	P I	P II
169	+0.42	+0.35	222	+0.42	+0.33
172	+0.49	+0.37	223	+0.39	+0.29
173	+0.49	+0.37	225	+0.39	+0.37
175	+0.48	+0.31	226	+0.40	+0.42
180	+0.46	+0.30	227	+0.43	+0.40
182	+0.47	+0.32	228	+0.41	+0.35
187	+0.46	+0.39	229	+0.46	+0.40
188	+0.46	+0.34	230	+0.45	+0.46
189	+0.44	+0.30	231	+0.42	+0.42
190	+0.45	+0.33	232	+0.45	+0.45
196	+0.34	+0.39	233	+0.42	+0.45
197	+0.40	+0.39	237	+0.46	+0.41
198	+0.37	+0.35	252	+0.29	+0.37
199	+0.40	+0.46			
200	+0.36	+0.40			
201	+0.30	+0.46			
202	+0.32	+0.30			
203	+0.40	+0.34			
204	+0.36	+0.40			
205	+0.35	+0.38			
206	+0.33	+0.35			
207	+0.33	+0.35			
208	+0.33	+0.35			
209	+0.36	+0.35			
210	+0.38	+0.26			
211	+0.57	+0.30			
	until 1719	Then			
	+0.42	+0.33			
212	+0.39	+0.30			
216	+0.40	+0.40			
218	+0.39	+0.30			
219	+0.37	+0.35			
220	+0.39	+0.32			
221	+0.38	+0.35			

VELOCITY CORRECTORS

OPR 492 - 1971



000051	0	0000	0001	000	000000	000000	<i>Days 169 thru 189</i>
000110	0	0002					
000167	0	0004					
000227	0	0006					
000287	0	0008					
000345	0	0010					
000402	0	0012					
000463	0	0014					
000522	0	0016					
000582	0	0018					
000642	0	0020					
000702	0	0022					
000761	0	0024					
000822	0	0026					
000880	0	0028					
000940	0	0030					
001000	0	0032					
001058	0	0034					
001118	0	0036					
001178	0	0038					
001238	0	0040					
001298	0	0042					
001356	0	0044					
001414	0	0046					
001474	0	0048					
001532	0	0050					
001596	0	0052					
001655	0	0054					
001720	0	0056					
000059	0	0000	0002	000	000000	000000	<i>Days 190 thru 214</i>
000117	0	0002					
000181	0	0004					
000243	0	0006					
000309	0	0008					
000374	0	0010					
000440	0	0012					
000508	0	0014					
000575	0	0016					
000645	0	0018					
000713	0	0020					
000780	0	0022					
000850	0	0024					
000915	0	0026					
000989	0	0028					
001065	0	0030					
001141	0	0032					
001220	0	0034					
001299	0	0036					

001378 0 0038
001453 0 0040
001530 0 0042
001610 0 0044
000052 0 0000 0003 000 000000 000000 *Days 215 thru 237*
000106 0 0002
000159 0 0004
000210 0 0006
000264 0 0008
000313 0 0010
000367 0 0012
000421 0 0014
000478 0 0016
000534 0 0018
000589 0 0020
000644 0 0022
000700 0 0024
000755 0 0026
000810 0 0028
000866 0 0030
000920 0 0032
000975 0 0034
001030 0 0036
001089 0 0038
001142 0 0040
001199 0 0042
001253 0 0044
001310 0 0046
001365 0 0048
001420 0 0050
001472 0 0052
001529 0 0054
001582 0 0056
001639 0 0056
001639 0 0058
000052 0 0000 0004 000 000000 000000 *Days 238 thru 266*
000100 0 0002
000150 0 0004
000199 0 0006
000247 0 0008
000295 0 0010
000345 0 0012
000390 0 0014
000444 0 0016
000500 0 0018
000565 0 0020
000634 0 0022
000700 0 0024
000765 0 0026
000830 0 0028
000894 0 0030
000960 0 0032
001023 0 0034
001090 0 0036
001157 0 0038
0001219 0 0040
001281 0 0042
001349 0 0044
001411 0 0046
001479 0 0048
001541 0 0050
001609 0 0052
000056 0 0000 0005 000 000000 000000 *Days 267 thru 286*
000111 0 0002

000165 0 0004
000228 0 0006
000271 0 0008
000323 0 0010
000376 0 0012
000429 0 0014
000482 0 0016
000536 0 0018
000590 0 0020
000644 0 0022
000698 0 0024
000752 0 0026
000805 0 0028
000858 0 0030
000911 0 0032
000964 0 0034
001018 0 0036
001072 0 0038
001124 0 0040
001175 0 0042
001227 0 0044
001280 0 0046
001333 0 0048
001387 0 0050
001440 0 0052
001494 0 0054
001548 0 0056
001603 0 0058
000061 0 0000
000121 0 0002
000182 0 0004
000243 0 0006
000303 0 0008
000364 0 0010
000425 0 0012
000486 0 0014
000549 0 0016
000610 0 0018
000670 0 0020
000726 0 0022
000784 0 0024
000842 0 0026
000900 0 0028
000959 0 0030
001018 0 0032
001076 0 0034
001133 0 0036
001191 0 0038
001250 0 0040
001308 0 0042
001365 0 0044
001426 0 0046
001486 0 0048
001546 0 0050
001603 0 0052
001663 0 0054

0006 000 000000 000000 *Days 287 thru 294*

20-25-71

FEST=70000
CLAT=4291000
CMER=270300
GRID=1/0
PLSCL=20000
PLAT=38/54/05
PLON=38/54/05
MLAT=38/47/45.027
MLON=75/05/33.290
S1LAT=38/56/25.001
S1LON=74/58/16.975
S2LAT=38/59/47.383
S2LON=75/19/32.554
Q=1799.6
VES=2930
YR=71

20-2N-71

FEST=70000
CLAT=4291000
CMER=270300
GRID=1/0
PLSCL=20000
PLAT=38/54/55
PLON=75/16/55
MLAT=38/47/45.027
MLON=75/05/33.290
S1LAT=38/56/25.001
S1LON=74/58/16.975
S2LAT=38/59/47.383
S2LON=75/19/32.554
Q=1799.6
VES=2930
YR=71
©

SHEET LIMITS



900	38 48 1200	074 56 2700
901	38 52 4200	074 56 2700
902	38 52 4200	075 00 0900
903	38 56 4500	075 00 0900
904	38 52 1200	075 00 3000
905	38 50 3000	075 00 3000
906	38 50 3000	075 05 4500
907	38 46 3900	075 05 4200
908	38 46 4200	075 04 3600
909	38 50 5100	075 04 3600
910	38 50 5100	075 09 2400
911	38 50 5100	075 14 0600
912	38 46 4200	075 14 0600
913	38 46 4200	075 09 2400
914	38 48 0000	075 05 4200
915	38 55 1800	075 05 4200
916	39 02 5400	075 05 4200
917	39 02 5400	075 16 1800
918	38 55 1800	075 16 1800
919	38 48 0000	075 16 1800
920	38 50 1800	075 05 4500
921	38 53 0000	075 12 3000
922	38 54 1200	075 10 0000
923	38 57 3600	075 12 3900
924	38 58 5100	075 10 0000

925 38 02 5400 075 12 4500
926 38 00 3600 075 08 3000
927 39 01 0000 075 07 3000
928 38 58 3000 075 05 4200
929 38 58 0300 075 06 3600
930 38 50 3000 075 02 0800
931 38 55 4800 075 02 0800
932 38 55 4800 075 00 0900
933 38 51 0000 074 56 2700
934 38 51 0000 075 00 3000
935 38 55 4800 075 05 4200
936 38 46 4200 075 07 1800
937 38 48 0600 075 07 1800
938 38 48 0600 075 04 3600
939 38 47 1800 075 07 1800
940 38 47 5000 075 09 2000

ATLANTIC MARINE CENTER
APPROVAL SHEET
FOR
AUTOMATED SURVEY H-9202

- A. All revisions and additions made on the smooth sheet during verification have been entered in the magnetic tape records for this survey. A new final position printout has/~~has not~~ been made. A new final sounding printout has/~~has not~~ been made.

Date: June 6, 1974

Signed: William L. Jonns
Title: **William L. Jonns**
Chief, Verification Branch

- B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Hydrographic and AMC Manuals. Exceptions are listed in the verifier's report.

Date: June 6, 1974

Signed: C. Dale North Jr.
Title: **C. Dale North Jr. LCDR, NOAA**
Chief, Processing Division

July 2, 1973

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Atlantic Marine Center

Hourly heights are approved for

Tide Station Used (NOAA form 77-12): Lewes, Delaware
Brandywine Shoal Lt., N.J.

Period: June 18-October 8, 1971

HYDROGRAPHIC SHEET: H-9202

OPR: 492

Locality: Delaware Bay

Plane of reference (mean ~~lower~~ low water): Lewes, Delaware 2.5 ft.
Brandywine Shoal Lt. 2.0 ft.

Height of Mean High Water above Plane of Reference is
Lewes, Delaware 4.1 ft.
Brandywine Shoal Lt. 5.0 ft.

Remarks:

Multiple tide gage survey.

Robert A. Cummins

Chief, Tides Branch

ATLANTIC MARINE CENTER
 VERIFICATION OF SMOOTH TIDES

SURVEY H- 9202 (WH-20-2-71)

PLANE OF REFERENCE TIME MERIDIAN HEIGHT DATUM ON STAFFS	MLW OR * <u>Ratio</u> *	GMT			
		1. <u>2.5</u>	2. <u>2.0</u>	3. <u> </u>	
<u>TIDE STATIONS</u>	<u>POSITION</u>	<u>TYPE GAGE</u>	<u>TIME CORR. H.W. L.W.</u>	<u>HEIGHT CORR. H.W. L.W.</u>	<u>*</u>
1. Lewes, Del.	Ø 38 47.1' Y 75 07.0'		0 0	0 0	0 0
2. Brandywine Shoal Lt., N.J.	Ø 38 59.0' Y 75 07.0'		0 0	0 0	0 0
3.	Ø Y				

HOURLY HIGHTS FROM ROCKVILLE OFFICE
 FROM FIELD MARIGRAMS VERIFIED BY Rockville Office

TIDE ZONING NOT APPLICABLE
 BY COMPUTER
 FROM TWO OR MORE GAGES

LIMITS AND DESCRIPTION OF ZONING METHODS
 Multiple gage

TIDE CORRECTIONS COMPILED BY COMPUTER
 MANUALLY VERIFIED BY: BTD
 VERIFIED BY:

HEIGHT OF MHW ABOVE PLANE OF REFERENCE 4.1 Lewes, Del.
 5.0 Brandywine Shoal Lt.

TIDE CORRECTIONS VERIFIED ON SOUNDING PRINTOUT BY: BTD

DATE OF VERIFICATION 9/24/73

*OR RATIO

EXAMINED & APPROVED
[Signature]

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

1/26/73

Processing Division: Atlantic Marine Center

Hourly heights are approved for Form 362 Hourly Heights

Tide Station Used (NOAA form 77-12): Brandywine Shoal Lt.
Delaware Bay, New Jersey

Period: June 18 - Oct. 8, 1971

HYDROGRAPHIC SHEET: H-9202

OPR: 492

Locality: Delaware Bay, New Jersey

Plane of reference (mean ~~lower~~ low water): 2.0 ft.

Height of Mean High Water above Plane of Reference is 5.0 ft.

Remarks:

The following Hourly Heights have been computed from the
Lewes Delaware observations:

<u>DAY</u>	<u>HOUR</u>
295	1356 - 1902
299	1321 - 1900
300	1320 - 1506

Robert A. Cannon

Chief, Tides Branch

ATLANTIC MARINE CENTER

PROJECTION PARAMETERS

POLYCONIC OR MODIFIED TRANSVERSE MERCATOR

- 1. Project No. 492
- 2. Reg. No. _____
- 3. Field No. WH 20-2-71
- 4. Requested By _____
- 5. Ship or Office _____
- 6. Date Required _____

7. Polyconic Modified Transverse Mercator

8. Central Meridian of Projection 75 ° 11 ' 06 "

9. Survey Scale: 1: 20,000

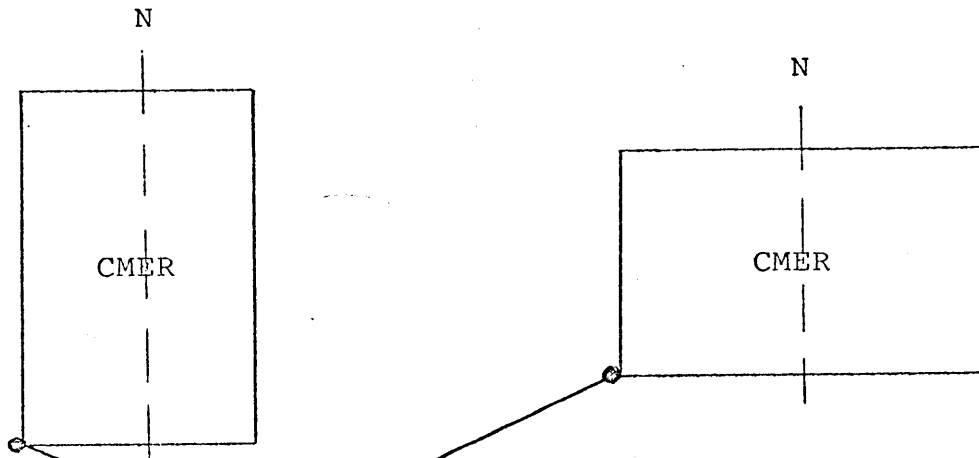
10. Size of Sheet (check one):

36 x '54 36 x 60 Other Specify _____

11. Sheet Orientation (check one):

NYX = 1

NYX = 0



12. Plotter Origin: S.W. Corner of Sheet (not necessarily a grid intersection)

Latitude 38 ° 47 ' 06 "

Longitude 75 ° 17 ' 05 "

13. G.P.'s of triangulation and/or signals attached.

14. Material Desired: Tracing Paper Mylar

Smooth Sheet Other Specify _____

15. Remarks: _____

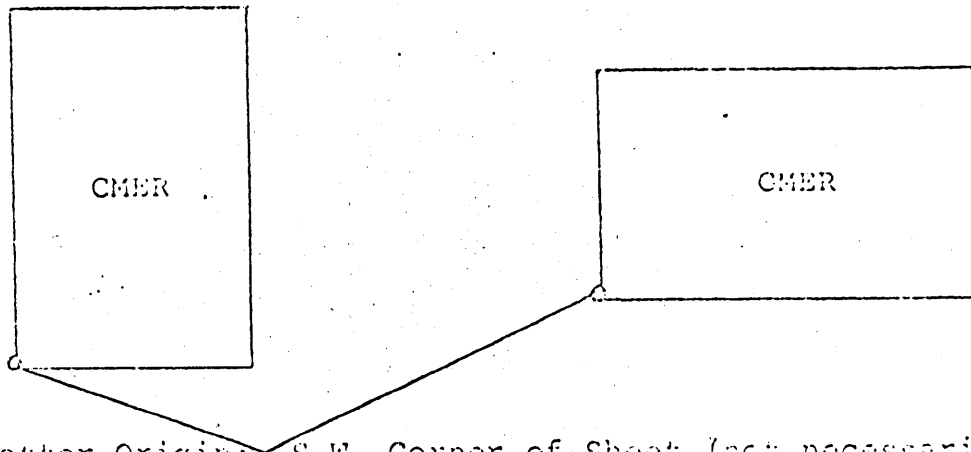
CAM3-1
2-18-71

ATLANTIC MARINE CENTER

PROJECTION PARAMETERS

POLYCONIC OR MODIFIED TRANSVERSE MERCATOR

1. Project No. 492 4. Requested By Verification Br.
2. Reg. No. H-9202W 5. Ship or Office _____
3. Field No. (WH 20-2-71) 6. Date Required With smooth shee
7. Polyconic Modified Transverse Mercator
8. Central Meridian of Projection 75 ° 15 ' 30 "
9. Survey Scale: 1: 20,000
10. Size of Sheet (check one):
36 x 54 36 x 60 Other Specify 7" X 9"
11. Sheet Orientation (check one):
NYX = 1 NYX = β
N N



12. Plotter Origin: S.W. Corner of Sheet (not necessarily a grid intersection)
Latitude 39 ° 02 ' 40 "
Longitude 75 ° 16 ' 05 "
13. G.P.'s of triangulation and/or signals attached
14. Material Desired: Tracing Paper Mylar
Smooth Sheet Other Specify _____
15. Remarks: The longitude lines will be the same as the
regular sheet.

Reg. No. H-9202

The Computer and Excess Sounding Cards for this survey have not been corrected to reflect the changes made to the Computer Card and Excess Card Printouts at this time of the review.

When the cards have been updated to reflect the final results of the survey the following shall be completed:

CARDS CORRECTED

DATE _____ TIME REQ'D _____ INITIALS _____

REMARKS:

Reg. No. H-9202

The magnetic tape containing the data for this survey has not been corrected to reflect the changes made during evaluation and review.

When the magnetic tape has been updated to reflect the final results of the survey, the following shall be completed:

MAGNETIC TAPE CORRECTED

DATE _____ TIME REQ'D. _____ INITIALS _____

REMARKS:

FIG. 18.

DESCRIPTIVE REPORT DATA RECORD		
PART I SMOOTH SHEET PREPARATION	PREPARED BY/OPERATOR	DATE
A. PLOTTER OPERATOR		
B. DISTORTION MARKS PLOTTED		
C. PROJECTION INTERSECTIONS PLOTTED		
D. POINTS OF ELECTRONIC CONTROL ARCS PLOTTED		
E. OVERLAYS PREPARED BY		
1. POSITION NUMBER		
2. EXCESS SOUNDINGS		
3. PRELIMINARY SMOOTH PLOT		
4. LIST OTHERS		
A.		
B.		
F. SOUNDING SELECTION BY		
G. PLOTTER INPUT	PREPARED	
H.	CHECKED	
I. DESCRIPTIVE REPORT ADDENDUMS		
PART II SMOOTH SHEET COMPLETION	B. J. STEPHENSON	6-4-74
	CARTOGRAPHER	DATE
A. DISTORTION SCALE TICKS IDENTIFIED BY NOTE	EDP-AMC B. J. STEPHENSON	6-04-74
B. PROJECTION INTERSECTIONS VERIFIED BY	EDP-AMC B. J. STEPHENSON	5-23-74
C. PROJECTION LINES RULED BY	EDP-AMC	5-23-74
D. ELECTRONIC CONTROL ARCS RULED AND LOCATION VERIFIED	EDP-AMC B. T. DAVIS	12-6-73
E. OVERLAYS COMPLETED BY	B. J. STEPHENSON	4-3-74
1. POSITION NUMBER LEADERS ADDED		
2. EXCESS SOUNDING OVERLAY COMPARED	B. J. STEPHENSON	4-3-74
3. PRELIMINARY SMOOTH PLOTS COMPARED		
4. OTHERS UTILIZED		
A.		
B.		
F. DESCRIPTIVE REPORT ADDENDUM	W. L. JONNS	
G. CONTROL STATIONS VERIFIED	N. A.	
H. POSITIONS MANUALLY PLOTTED		
I. MANUAL PLOT VERIFIED		
J. SHORELINE APPLIED	B. J. STEPHENSON	5-28-74
K. BOTTOM CHARACTERISTICS ADDED	"	5-29-74
L. NOTES AND DEPTH CURVES ADDED	"	5-30-74

Fig. 19.

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET & PNO		1	BOAT SHEETS		1 (4 parts)
DESCRIPTIVE REPORT		1	OVERLAYS		1

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/SOURCE DOCUMENTS
ENCLOSURE BODIES ENVELOPES	8		3-Bundles			
CAHIERS	3		3			
VOLUMES	4					
BOXES			4			

T-SHEET PRINTS (List) ~~100059, 00060, 00061, 00062~~

SPECIAL REPORTS (List)

OFFICE PROCESSING ACTIVITIES
The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS			
	PRE-VERIFICATION	VERIFICATION	REVIEW	TOTALS
POSITIONS ON SHEET				10,783
POSITIONS CHECKED		1100		
POSITIONS REVISED		250		
DEPTH SOUNDINGS REVISED		1500	53	
DEPTH SOUNDINGS ERRONEOUSLY SPACED		800		
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED		0		
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS		8	4	
JUNCTIONS		4	10	
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS		245	10	
SPECIAL ADJUSTMENTS		0	0	
ALL OTHER WORK		399	220	
TOTALS		656	244	

PRE-VERIFICATION BY B.T. DAVIS, B.J. STEPHENSON	BEGINNING DATE 12-6-73	ENDING DATE 4-3-74
VERIFICATION BY B.J. STEPHENSON	BEGINNING DATE 5-28-74	ENDING DATE 6-4-74
REVIEW BY <i>J. W. Wellman</i>	BEGINNING DATE 1-6-75	ENDING DATE 3-14-75

USCOMALDC 36271-P66

*Geo Myers 6/9/75
Cartoons 24 Aug 7-8-75*

GEOGRAPHIC NAMES

Name on Survey	Source of Name											
	A	B	C	D	E	F	G	H	K			
BRANDYWINE SHOAL												1
BROADKILL BEACH												2
BROWN SHOAL												3
DELAWARE BAY												4
FOURTEEN FOOT BANK												5
FOWLER BEACH												6
HARBOR OF REFUGE												7
HAWKNEST												8
OLD BARE SHOAL												9
PRIMEHOOK BEACH												10
ROOSEVELT INLET												11
THE LOWER MIDDLE												12
THE SHEARS												13
												14
												15
												16
												17
												18
												19
												20
												21
												22
												23
												24
												25

Approved by:
 Chan. E. Harrington
 Staff Geographer
 16 Aug. 1974

H-9202

Items for Future Presurvey Reviews

The integrity of the general position of major shoals and depth curves since the time of the earliest surveys of the area shows the character of the area to be relatively stable and subject only to minor shifting of bottom sediments. There is, however, some indication of a southeasterly migration of the longitudinal axis of a few of the charted shoals.

Position Index	Bottom Change	Use	Resurvey Cycle	
Lat. Long.	Index	Index	(years)	
384	0752	3	2	50
384	0751	2	9	10
385	0752	2	2	50
385	0751	2	9	25
390	0752	2	9	25
390	0751	2	9	25

OFFICE OF MARINE SURVEYS AND MAPS

MARINE CHART DIVISION

HYDROGRAPHIC SURVEY REVIEW

REGISTRY NO. H-9202

FIELD NO. WH-20-2-71

Delaware, Delaware Bay, Harbor of Refuge to Fourteen Foot Bank

SURVEYED: June 18 thru September 9, 1971

SCALE: 1:20,000

PROJECT NO.: OPR-492

SOUNDINGS: Raytheon DE-723-D
Depth Recorder
Divers

CONTROL: Hi-Fix (Hyper-
bolic Mode) and
Raydist (Range-
Range)

Chief of Party C. H. Nixon
Surveyed by C. H. Nixon
..... K. F. Burke
..... J. D. Carpenter
..... P. L. Campbell
..... J. D. Busman
..... D. W. Yeager
..... R. C. Hoge
..... W. A. Hill
Automated Plot by Calcomp Plotter
#618 (AMC)
Verified and inked by B. J. Stephenson
Reviewed by K. W. Wellman
..... Date: March 14, 1975
Inspected by G. K. Myers

1. Description of the Area

This survey covers the southwest portion of Delaware Bay from Harbor of Refuge to Fourteen Foot Bank. The irregular bottom in the area is characterized by many sand ridges and shoals which sharply rise some 15-40 feet from surrounding deeper depths. In some cases, these shoals crest within 3-6 feet of mean low water. The deepest depth in the area is 124 feet. A Federal Project Channel crosses a portion of the area. The bottom composition is primarily sand with varying amounts of mud, shell and pebbles.

2. Control and Shoreline

The origin of control is given in section F of the Descriptive Report.

The shoreline originates with advanced photogrammetric surveys TP-00059, TP-00060 and TP-00061 of 1969-71 and TP-00062 of 1969-70.

3. Hydrography

A. Depths at crossings are in good agreement.

B. The usual depth curves are adequately delineated with the exception of the low-water depth curve which falls in close proximity to the surf zone. The 3-ft. supplemental depth curve was added during verification to more adequately delineate the bottom configuration.

C. The development of the bottom configuration and the investigation of least depths are considered adequate.

4. Condition of Survey

The sounding records, automated plotting and Descriptive Report are adequate and conform to the requirements of the Hydrographic Manual supplemented by the Instruction Manual - Automated Hydrographic Surveys, with the following exceptions:

A. The submerged wreck located by the hydrographer at lat. $38^{\circ}57.91'$, long. $75^{\circ}11.82'$ was not plotted on the smooth sheet.

B. The verifier lettered the official names of two aids to navigation in vertical rather than slanted lettering as required by section 6-14 of the Hydrographic Manual.

C. The junctional notes for H-9241 (1971) and H-9153 (1970) were not transferred in mechanical lettering as required by section 6-91 of the Hydrographic Manual.

D. A 13-ft. sounding was erroneously excessed at lat. $38^{\circ}57'$, long. $75^{\circ}08'$. This sounding is the least depth in the area.

E. Photogrammetric surveys were not listed in part II of the Verifier's Report.

F. Position numbers for each vessel were not assembled in numerical order in the final printouts. Requirements of section 4-5 of the Automated Hydrographic Surveys Manual, together with sequential numbering of positions in chronological order for each vessel, should be followed.

5. Junctions

Adequate junctions have been effected with H-9241 (1971) and H-9153 (1970) on the east. The junctions with H-9154 (1970) and H-9203 (1971) on the southeast are considered in the reviews of those surveys. Present depths are in general harmony with charted depths on the west and north where no contemporary surveys junction the present survey.

6. Comparison with Prior Surveys

A.	H-118	(1842-43)	1:20,000
	H-119	(1842)	1:20,000
	H-122	(1842)	1:20,000
	H-123	(1842)	1:20,000
	<u>H-148</u>	<u>(1841-43)</u>	<u>1:80,000</u>

These prior surveys cover the area of the present survey. In general, a comparison between present and prior depths reveals differences of as much as 10 feet and in some instances as much as 18 feet resulting from differences in survey methods and sedimentation and scouring of the sand and shell bottom.

The location and configuration of shoals are generally unchanged. However, in the vicinity of Old Bare Shoal at lat. $38^{\circ}56.5'$, long. $75^{\circ}14.0'$ erosion of as much as 6 feet has occurred in spots originally bare at low water and the deep extending through the shoal in lat. $38^{\circ}55.3'$, long. $75^{\circ}12.0'$ has filled to a depth of about 4 feet.

Shoreline changes have occurred since the time of the prior surveys, most significantly in the area of Broadkill Inlet in lat. $38^{\circ}48.5'$. The inlet is presently

closed as a result of accretion in the shoreline of 100 to 200 meters. In other areas the shoreline has receded 100 to 400 meters.

Depth changes in this area are attributed mainly to tidal and current action and differences of survey methods.

The more completely developed present survey is adequate to supersede the prior surveys within the common area.

B.	H-1476a	(1880)	1:20,000	H-1631	(1884)	1:20,000
	H-1476b	(1880)	1:10,000	H-1632	(1884)	1:20,000
	H-1533	(1882)	1:40,000	H-3076	(1910)	1:20,000
	H-1566	(1883)	1:20,000	H-2532b	(1910)	1:20,000
	<u>H-1582</u>	<u>(1883)</u>	<u>1:20,000</u>	<u>H-3526</u>	<u>(1910)</u>	<u>1:10,000</u>

These prior surveys cover the area of the present survey. A comparison between present and prior depths reveals variable differences generally less than 7 feet, caused in part by methods of surveying and by sedimentation and scouring of tidal currents. The major shoals have remained relatively stable in position and depth but some have accreted south easterly usually less than .3 to .4 mile. The Lower Middle has increased in width by 300 meters. The 24-ft. shoal in lat. $39^{\circ}01.5'$, long. $75^{\circ}10.7'$ has apparently been created by the dumping of spoil. Present depths on the crests of shoals are from 3 to 4 feet shoaler to 3 to 4 feet deeper than on the prior surveys.

The submerged wreck located at lat. $38^{\circ}59.63'$, long. $75^{\circ}11.73'$ on H-1582 was never charted and no evidence of this wreck falling in present depths of 8-12 feet was found. The wreck is considered to be no longer in existence.

The shoreline between longitudes $75^{\circ}09.75'$ and $75^{\circ}12.50'$ has receded approximately 100 meters and between longitudes $75^{\circ}12.50'$ and $75^{\circ}13.40'$ has accreted approximately 100 meters, closing Broadkill Inlet.

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

C. H-7034 (1945) 1:10,000

A comparison between the prior and present surveys reveals a general deepening of 1 to 3 ft. These depth differences are attributed to current and tidal action in the area.

The shoreline has generally receded approximately 50 meters except in the vicinity of lat. $38^{\circ}48.60'$, long. $75^{\circ}11.60'$ where a shoaling of depths has resulted in the closing of a former inlet.

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

D. F.E. No. 9 W.D. (1950) 1:40,000
H-9172 W.D. (1968 - 70) 1:20,000 (unverified)

A comparison of the unverified wire-drag survey with the present survey will be made during the review of that survey.

F.E. No. 9 covers a small portion of the southeast corner of the present survey. A comparison between effective drag depths and present survey depths reveals conflicts in some areas of as much as 18 feet. These conflicts occur in the area lat. $38^{\circ}51'$ to $52'$ and long. $75^{\circ}05.6'$ to $07.2'$ and are the result of shoaling. The effective depths in this area are no longer valid.

However, a hang depth of 49 ft. on a wreck at lat. $38^{\circ}50.70'$, long. $75^{\circ}06.20'$ is in harmony with present depths and was carried forward to the present survey. The clearance depth over the wreck should be retained as charted.

7. Comparison with Chart 12216 (formerly chart 411) latest
print date 10-12-74
12304 (formerly chart 1218) latest
print date 11-23-74

A. Hydrography

The charted hydrography originates with the previously discussed prior surveys which require no further consid-

eration supplemented by partial application of the present survey boat sheets (Bp's 82903-06) and verified smooth sheet, and from prior information furnished by the Corps of Engineers and U.S. Navy. The source of a few soundings was not readily ascertainable.

Specific mention is made of the following items:

1. The two Fish Havens charted in the immediate vicinities of lat. $38^{\circ}49.35'$, long. $75^{\circ}07.60'$ and lat. $38^{\circ}50.10'$, long. $75^{\circ}07.05'$ originate with L-271 (1972) subsequent to the date of the present survey and should be retained on the chart.
2. The detached low water line charted in the immediate vicinity of lat. $38^{\circ}50.75'$, long. $75^{\circ}13.80'$ originates with the boat sheet of the present survey (Bp 82903). It was revised during verification and should be deleted from the chart.
3. The submerged wreck P.A. (approx. 17 ft. rep) charted in lat. $38^{\circ}56.81'$, long. $75^{\circ}12.60'$ originates with LNM 16/73 subsequent to the date of the present survey and should be retained on the chart.
4. The Obstruction P.A. charted in lat. $38^{\circ}56.70'$, long. $75^{\circ}10.50'$ originates with LNM 39/74 subsequent to the date of the present survey and should be retained on the chart.
5. The submerged wreck charted in lat. $38^{\circ}58.70'$, long. $75^{\circ}09.52'$ was erroneously interpreted from the boat sheet (Bp 82905) and should be deleted from the chart.
6. The 26-ft. sounding charted in lat. $38^{\circ}58.19'$, long. $75^{\circ}06.18'$ was erroneously transferred from the verified smooth sheet of the present survey and should be deleted from the chart.
7. The 40 and 43-ft. soundings charted in lat. $39^{\circ}00.15'$, long. $75^{\circ}08.78'$ and lat. $38^{\circ}58.43'$, long. $75^{\circ}07.82'$, respectively, from a 1974 survey by the

Corps of Engineers (Bp 87864), subsequent to the date of the present survey and should be retained on the chart.

8. The 1 and 6-ft. soundings charted in lat. $38^{\circ}59.79'$, long. $75^{\circ}07.39'$ and lat. $39^{\circ}00.44'$, long. $75^{\circ}07.74'$, respectively, originate with H-123 (1842). These depths falling in present depths of 7 and 17 feet are discredited by the present survey and should be deleted from the chart.

9. The 22-ft. sounding charted in lat. $38^{\circ}59.69'$, long. $75^{\circ}06.45'$, originates with H-1476a (1880). It was originally charted as $4\frac{1}{2}$ fathoms on chart 12214 and incorrectly transferred to the first edition of chart 12304. This sounding is considered discredited by the present survey and should be deleted from the chart.

10. The wire-drag 45-ft. cleared depth and wreck charted at lat. $38^{\circ}50.72'$, long. $75^{\circ}06.20'$ originates with F.E. No. 9 (1950) and should be retained on the chart.

11. The submerged piles charted in lat. $38^{\circ}54.00'$, long. $75^{\circ}16.00'$ originate with L239/56. They are not disproved by the present survey and should be retained on the chart.

12. The submerged wreck charted in lat. $38^{\circ}48.18'$, long. $75^{\circ}10.48'$ originated as a visible wreck with H-7034 (1945) and was charted as a submerged wreck on the basis of the present survey information. It should be retained as presently charted.

13. The visible wreck charted in lat. $38^{\circ}47.60'$, long. $75^{\circ}09.93'$ originates with H-7034 (1945). It is shown on the present survey in lat. $38^{\circ}47.66'$, long. $75^{\circ}09.96'$. The charted position should be revised accordingly.

14. The submerged wreck charted in lat. $38^{\circ}52.00'$, long. $75^{\circ}07.90'$ originates with N.M. 29 of 1951. It

is not disproved by the present survey and should be retained on the chart.

15. The submerged wreck P.A. charted in lat. $38^{\circ}56.59'$, long. $75^{\circ}10.14'$, originates with N.M. 18 of 1954. It is not disproved by the present survey and should be retained on the chart.

16. The 30-ft. sounding RK charted in lat. $39^{\circ}02.72'$, long. $75^{\circ}10.34'$ originates with chart letter 653 of 1937. It is not charted in accordance with the position given in the portion of L-653 dated August 19, 1937. The 30 RK should be retained on the chart and the charted position should be revised to agree with the source document.

17. The submerged wreck 16-ft. reported charted in lat. $38^{\circ}52.20'$, long. $75^{\circ}09.46'$ originates with the boat sheet of the present survey. The least depth was revised to 15-ft. during subsequent processing and should be revised accordingly on the chart.

Except as noted above the present survey is adequate to supersede the charted hydrography within the common area.

B. Controlling Depths

The tabulated controlling depths of the Brandywine Range of the Delaware River Channel, and Roosevelt Inlet are based on data subsequent to the date of the present survey information and supersedes the present survey for charting the controlling depths.

C. Aids to Navigation

The positions of buoys C"1" and N"2", located on the present survey in lat. $39^{\circ}02.58'$, long. $75^{\circ}14.20'$ and lat. $39^{\circ}02.77'$, long. $75^{\circ}13.70'$, respectively, are about $\frac{1}{2}$ mile southeasterly of the charted positions but more adequately mark the intended features.

Except as noted above, the charted positions of aids to navigation adequately mark the features for which they were intended.

8. Compliance with Instructions

This survey adequately complies with the project instructions.

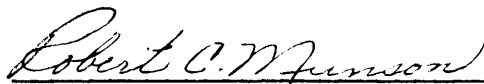
9. Additional Field Work

This is an excellent basic survey and no additional field work is recommended.

Examined and Approved:



Chief
Marine Chart Division



Associate Director
Office of Marine Surveys
and Maps

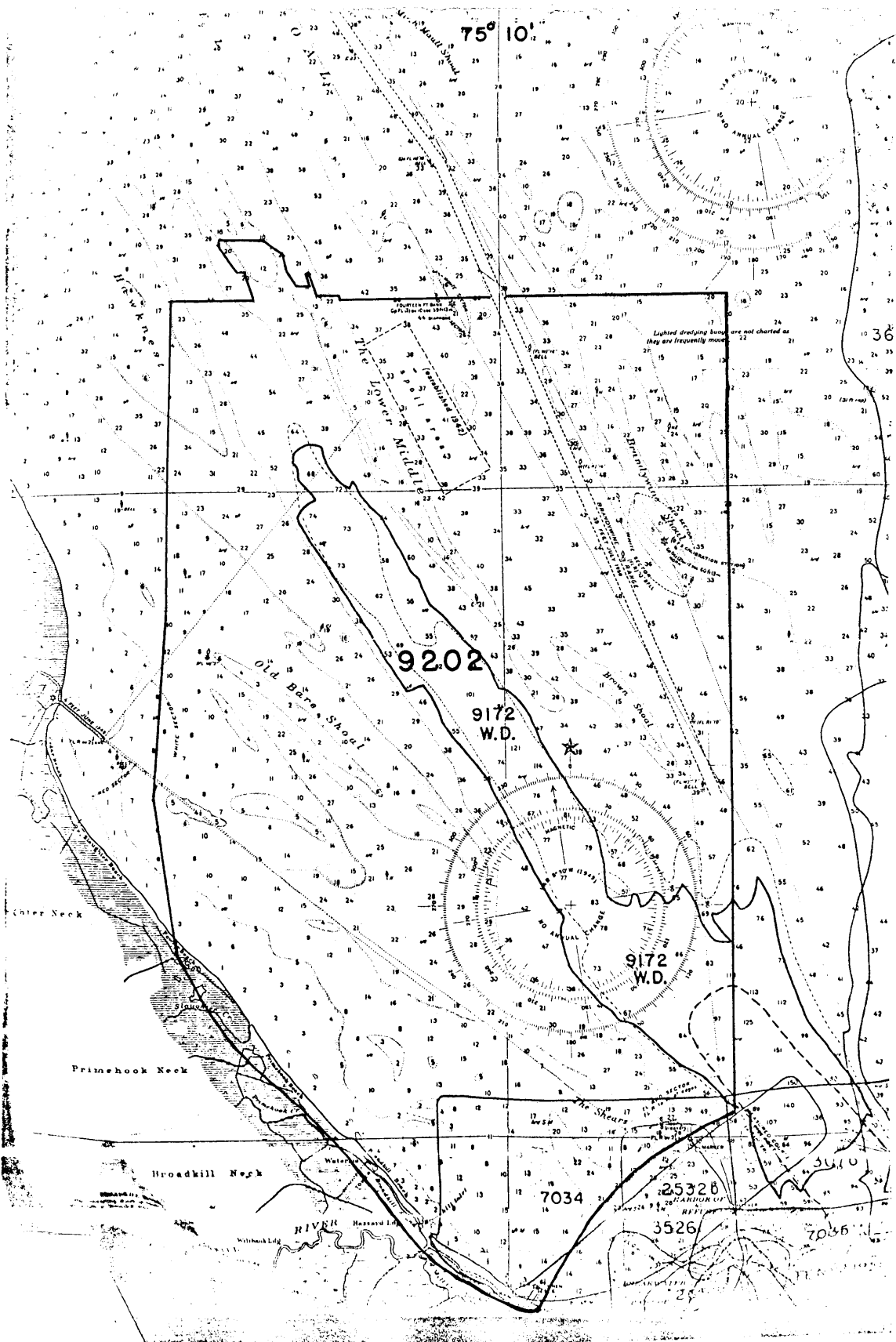


Chart - 1218

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9202

INSTRUCTIONS

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

CHART	DATE	CARTOGRAPHER	REMARKS
411	8/8/74	D. Harpine	Full Part Before After Verification Review Inspection Signed Via Drawing No. <u>CRITICAL CORRECTIONS</u>
1218	9/14/74	D. Harpine	Full Part Before After Verification Review Inspection Signed Via Drawing No. <u>Applied for critical corrections only thru chart 411 dwg. # 22 and this chart</u>
1219	9/25/74	D. Harpine	Full Part Before After Verification Review Inspection Signed Via Drawing No. <u>Appl FOR CRITICAL CORRECTIONS</u> only thru 1218
1109	12-27-74	D. Harpine	Full Part Before After Verification Review Inspection Signed Via Drawing No. <u>Appl for Critical Corr. No Corr.</u>
411	1/28/76	Richard L. Hogan	Full Part Before After Verification Review Inspection Signed Via Drawing No.
1219	4/29/76	Richard L. Hogan off	Full Part Before After Verification Review Inspection Signed Via Drawing No. <u>THRU CHART 411 in COMMON AREA</u>
1218	5/3/76	Richard L. Hogan off	Full Part Before After Verification Review Inspection Signed Via Drawing No. <u>THRU CHART 411 IN COMMON AREA</u>
1109	1/4/77	Richard L. Hogan	Full Part Before After Verification Review Inspection Signed Via Drawing No. <u>THRU CHART 1219</u>
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.