FE267

Diagram No. 77-3

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey ... Field Examination

Field No. ... PE-20-2-84

Registery No. ... FE-267

LOCALITY

State ... Maryland

General Locality ... Chesapeake Bay

Sublocality ... Point Lookout to Cedar Point

1984

CHIEF OF PARTY
CDR W.S. Simmons

LIBRARY & ARCHIVES

DATE ... September 23, 1986

☆U.S. GOV. PRINTING OFFICE: 1985—566-054

FE267

A-1
CHT
12233
12264
12230
12260
12220
CHARTED
SIGN OF
IN PACK

NOAA FORM 77-28 (11-72)

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

HYDROGRAPHIC TITLE SHEET

REGISTER NO.

~~D - 22~~
FE-267

FIELD NO.
PE-20-2-84

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

State: Maryland

General locality: Chesapeake Bay

Locality: Point Lookout to Cedar Point

Scale: ~~1 : 20,000~~ Various Scales Date of survey: 12 June to 21 June 1984

Instructions dated: March 23, 1984 Project No.: S-E404-PE-84

Vessel: NOAA Ship PEIRCE (VESNO 2830), and launches PE-1 (2831) and PE-2 (2832)

Chief of party: CDR Walter S. Simmons, NOAA

Surveyed by: LT Ross, LTJG Conricote, ENS Maddox, ENS Barnum

Soundings taken by echo sounder, ~~hand lead, pole~~: Raytheon DSF 6000N

Graphic record scaled by: VDR, JHM, VAB, PK, RB

Graphic record checked by: BM, JHM, DAW, VDR, VAB

Protracted by: _____ Automated plot by: Hydroplot (PEIRCE)
XYNETICS 1201 Plotter (AMC)

Verification by: N. A. Wike

Soundings in ~~fathoms~~ feet at ~~MLW~~ MLLW: ~~Predicted~~

REMARKS: All times are Coordinated Universal Time

Changes noted in Red were made during position Verification at AMC
GMT

Notes in red were made during office processing.

STANDARDS CK'D 9-25-86
C.Clay

5/15/89
D.C.J.

AWOIS/SURF 5/5/89 GKM

NOAA FORM 77-28 SUPERSEDES FORM C&GS-537.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1978-665-010/174

DESCRIPTIVE REPORT
TO ACCOMPANY HYDROGRAPHIC SURVEY
D-22 (PE-20-2-84)
1:20,000 SCALE, 1984

CDR WALTER S. SIMMONS, NOAA
CHIEF OF PARTY

A. PROJECT

This Chart Evaluation survey was conducted in accordance with Hydrographic project instructions S-E404-PE-84 dated March 23, 1984, and change No. 1 of April 16, 1984. This survey responds to a request from the Commander, Naval Base, Norfolk, Virginia, to have updated charting information in two designated hurricane anchorages in Chesapeake Bay. This report covers the survey of the northerly anchorage of this project from June 12, 1984 to June 21, 1984 (J.D. 164 to J.D. 173).

Although this survey is designated a chart evaluation survey, the descriptive report is submitted as for a basic survey as required by section 5.3 of the Hydrographic Manual. This is because the anchorage area surveyed covers portions of several charts and is more logically treated as a separate survey, rather than discussing each chart separately. Depths from this survey are also compared to prior surveys of the area, which is not required by the concept of chart evaluation.

See Evaluation Report

Loran-C data were recorded by the Hydroplot system concurrently with position fixes for soundings by PEIRCE (VESNO 2830).

B. AREA SURVEYED

This survey is located in northern Chesapeake Bay, offshore Cedar Pt. and extending southward to Pt. Lookout. The actual limits of the 1:20000 scale survey are defined by lines connecting the following points.

1) 38°02'42"N
76°17'36"W

2) 38°03'24"N
76°15'18"W

3) 38°07'37"N
76°10'18"W

4) 38°13'12"N
76°13'00"W

5) 38°19'06"N
76°18'00"W

6) 38°16'42"N
~~87~~°23'12"W
~~76~~

7) 38°12'00"N
76°21'30"W

8 ~~38°12'00"N~~
~~76°21'30"W~~

9) 38°07'21"N
76°17'42"W

C. SOUNDING VESSELS

All soundings were acquired by PEIRCE (VESNO 2830) and two launches PE-1 (VESNO 2831) and PE-2 (VESNO 2832). All were equipped with the Hydroplot System. No unusual sounding vessel configuration was used.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDING

All vessels in this survey acquired soundings using Raytheon DSF 6000N Fathometers. The serial numbers for each vessel are as follows:

VESSEL	VESNO	S/N OF FATHOMETER
PEIRCE	2830	A 105 N
PE-1	2831	A 115 N
PE-2	2832	A 119 N

No unusual problems occurred with these instruments.

The velocity correctors were determined by one Martek cast taken on 13 June (J.D. 165) at 38°05'12"N Latitude 076°17'12"W Longitude, using Martek Model 167, serial number 177. This instrument was calibrated on 22 February, 1984. Comparisons were made to a Nansen Cast taken on 19 April, 1984 (JD 110). The Martek Cast taken on that same day compared identically to the Nansen Cast. Bar check data for both launches were compared with this Martek cast, and the correctors obtained were similar for both methods. Correctors for all vessels were obtained from this one cast. No problems were encountered during any of the velocity data acquisition. See section 4.a. of the Evaluation Report.

A draft correction of +1.6 feet was applied via the corrector tapes for all soundings obtained by launches PE-1 and PE-2. A draft corrector of +10.00 feet was applied for the ship, via the corrector tapes. The actual mean draft for all ship work was 10.6 feet. This was computed by averaging the observed draft readings at the beginning and end of the survey period. The additional 0.6 foot draft corrector has not been applied to the final field sheet soundings but is listed in the sounding correction abstract of Appendix D.

Settlement and squat tests for both launches were run on March 12, 1984 at Portsmouth Naval Hospital pier using the Zeiss level instrument, S/N 7423 and a stadia rod positioned over the transducers. Settlement and squat tests for the ship were run in Chesapeake Bay on May 9, 1984 running by "Mo(A)" buoy located at latitude 37°30'54"N, longitude 076°02'42"W. The technique utilized the Raytheon DSF 6000N Fathometer S/N A119N and recording the depth near the bouy at different throttle speeds.

The sounding correction abstract, velocity corrector curves and tape printout, draft determination report, and settlement and squat report can be found in Appendix D of this report.

E. HYDROGRAPHIC SHEETS

All field sheets were made on board PEIRCE using the Hydroplot system and complot plotter with program RK201. Final field sheets will not be replotted, but will be transmitted to the Marine Center for the preverification review process only. *See Evaluation Report*

F. CONTROL STATIONS

All horizontal control used in this survey is based on the North American Datum of 1927. Cedar Falcon (1984) was trilateraled using two first-order Defense Mapping Agency stations and two taped distances from those positions. No other unmonumented stations were used for control in this survey. A complete list of signals for all control work are included in the project Horizontal Control report and in Appendix F. Positions of NGS stations were obtained from the NGS data base. DMATC positions were obtained from Geodetic Survey Project NATC Paxtent, MD. A report on this DMA survey and field computations and sketch for Cedar Falcon is included in Appendix F.

G. HYDROGRAPHIC POSITION CONTROL

The positional control system used for this survey was the Mini-Ranger Falcon 484. The electronic equipment used for this survey follows:

VESNO/STATION	EQUIPMENT	S/N	J.D.
PEIRCE (2830)	Range Processing Unit	D0017	164 - 173
	Control Display Unit	D0061	164 - 173
	RT Unit	C2000	164 - 173
PE-1 (2831)	Range Processing Unit	D0018	164 - 173
	Control Display Unit	D0057	164 - 173
	RT Unit	C2096	164 - 173
PE-2 (2832)	Range Processing Unit	D0019	164 - 173
	Control Display Unit	D0062	164 - 173
	RT Unit	D2128	164 - 173
Cedar Falcon	Reference Station	C2091	164 - 173
Point No Point LH	Reference Station	C2065	164 - 173
Holland Island Bar LH	Reference Station	C2059	164 - 167
Hooper Island Lighthouse	Reference Station	C2059	168 - 173
Point Lookout Lighthouse	Reference Station	C2067	164 - 173

Weekly critical system checks were made during this project and a daily systems check made every day by each vessel in accordance with the PMC OPORDER. On J.D. 171 and 172 no daily systems check was conducted on launch PE-1 (VESNO 2831), but the final baseline calibration at the end of the project shows no substantial drift of correctors. It is believed the data acquired by PE-1 during those days still remain well within positioning requirements. Critical system checks were done with three point sextant fixes to shore stations.

A nonstandard daily system check was employed for this survey by using the least-squares positioning feature of the Mini-Ranger Falcon. The method is as follows:

1) Enter the baseline correctors appropriate to each of the three or four reference stations used.

2) Select the plane range and x-y position feature of the Mini-Ranger.

3) After the system has computed a least squares position, observe the residuals displayed for each range.

4) The Falcon System is considered to have passed the daily check if all residuals are less than 10 meters for this 1:20,000 scale survey.

H. SHORELINE

There is no shoreline within the limits of this survey.

I. CROSSLINES

Total mileage of crosslines run on this survey was 58.8 nautical miles (28.4% of the total mainscheme mileage). Crosslines show very good agreement with mainscheme.

J. JUNCTIONS

There are no contemporary surveys that junction with this survey.

K. COMPARISONS WITH PRIOR SURVEYS *See also the Evaluation Report*

There were six (6) AWOIS Items investigated within this survey. The following is a list of those items:

AWOIS ITEM NO.	REPORTED AS	REPORTED POSITION
3424	Obstruction	38°05'09"N LAT 076°14'34"W LON
3425	Obstruction	38°05'23"N LAT 076°15'06"W LON
3426	18 Ft Sounding	38°07'43"N LAT 076°17'26.1"W LON

3427	Dangerous Submerged Wreck	38°09'36"N LAT 076°18'00"W LON
3428	Obstruction	38°14'07.8"N LAT 076°20'18"W LON
3433	Dangerous Submerged Wreck	38°16'16"N LAT 076°22'27"W LON

Investigation of AWOIS Item No. 3424 began on J.D. 165 using Klien Associates Side Scan Sonar S/N 233-ID471 and towed behind PE-1 (VESNO 2831) at 800 rpm. This item was found on the first pass at a position 38°05'09.3"N LAT, 076°14'33.1"W LON. A star pattern search was conducted by PE-1 (VESNO 2831) for a least depth on J.D. 165 and a 41 foot least depth was found and plotted on side scan coverage plot sheet at its new location. Refer to the Sonar Contact Log for additional information. ~~Recommend retaining obstruction as presently charted.~~ See section 6.6 of the Evaluation Report for FE-27555 (1985)

AWOIS Item No. 3425 is reported as two wreckages, in addition to the above position the second wreckage is reported in location of 38°05'21"N LAT, 076°15'08"W LON. Investigation of this item began on J.D. 164 using Klien Associates Side Scan Sonar S/N 233-ID471 towed behind PE-1 (VESNO 2831) at 800 rpm. On the second and third pass over the charted position two contacts were observed on the sonargram trace at two different positions. ~~See sec~~

In addition to the first three passes, another two track lines were made normal to the others over the charted positions. No other contacts lie near the charted positions. It is believed that the contacts that were observed are the obstructions that were described in the AWOIS Item List. On J.D. 165 a star pattern search was conducted by launch PE-1 (VESNO 2831) to record a least depth. A 40 foot least depth was recorded for Contact 2 at position 38°05'20"N LAT 076°15'01.8"W LON and a 43 foot least depth recorded for Contact 1 at position 38°05'23.6"N LAT, 076°15'03.9"W LON. Refer to the Sonar Contact Log for additional information. ~~Recommend retaining obstruction as presently charted.~~ See section 6.6 of the Evaluation Report for FE-27555 (1985)

AWOIS Items 3424 and 3425 were plotted on board NOAA Ship PEIRCE using a 1:2500 scale enlargement of the search area. Positions of the reported obstructions and search radius were plotted using the PDP/8E computer on a standard Mylar sheet. All data acquired by launch PE-1 (VESNO 2831) during the search was collected and punched into digital format on board the vessel. Processing the data involved only plotting the positions of the launch on the Mylar sheet and scanning the sonargram for effective coverage. The effective range of the side scan sonar was transferred by hand to the Mylar sheet and colored for easy review. This Mylar sheet has been labeled with the AWOIS Item number(s) and titled "Side Scan Coverage Plot". All contacts were plotted on the final field sheet with least depth in their true position. A Side Scan Sonar Log accompanies the data and is a very good guide when looking for contacts on the sonargram. All projection parameter data is appended to this report,

AWOIS Item No. 3426 is reported as an 18 foot sounding located at position 38°07'43.8"N LAT and 076°17'26.1"W LON. A development was run with 10 meter spaced lines by NOAA Launch PE-1 (VESNO 2831) on J.D. 166, recording soundings using a Raytheon DSF 6000N. An 18 foot (corrected) depth was observed very near the presently charted location. Recommend that the 18 foot sounding be retained in its presently charted position. See section 7.a.1) of the Evaluation Report.

Investigation of AWOIS Item No. 3427 began on J.D. 166 using Klein Associates Side Scan Sonar S/N 233-ID471. 400% coverage was achieved in a 250 meter radius circle centered on the charted position and no evidence of the wreck was found. ~~Recommend removal of the wreck, PA, from the chart~~. Do not concur; see section 7.a.2) of the Evaluation Report.

Investigation began on J.D. 170 for AWOIS Item No. 3428. A 200% side scan sonar coverage was achieved within a 100m radius circle centered on the reported position of this obstruction. The side scan record revealed a very small object which showed a shadow less than one meter in length. This object plotted about 50 meters to the northwest of the charted position of the obstruction. On 19 June a launch constant-tension wire drag was conducted to about fifty meters north and south of the sonar contact, with an effective depth of 33 feet. The wire drag operation unfortunately left a holiday directly over the contact's position and the wire drag search was not resumed because of adverse weather. A star pattern echo sounder search was conducted over the position on 21 June with negative results.

On 18 June (J.D. 170) the PEIRCE OPS Officer visited Mr. Les Ryan, Director of the Patuxent River Naval Air Test Center Target Support Group (SEPTAR BASE). He reported that the charted submerged obstruction was the remains of what is locally known as "Bat Target", which was a lighted single pile structure. This target was destroyed by ice in the late 1970's, but the submerged piling remained with a least depth of about 15 feet. He recalled that in 1980 a Navy/NOS dive team located the pile and secured a 55 gallon drum surface float to it. He also recalled that about two weeks later a Navy EOD team removed the obstruction "at the mud line" using explosives. He produced a copy of the EOD team report, which states that several targets were removed on the operation, and that all explosive charges were placed no higher than six feet above the bottom.

The Rude/Heck chart letter (#CL1382/80), which reported this obstruction, also mentions that other submerged destroyed targets were located by NOS divers. These are located to the SSE of "Bat Target" in an area known locally as "Hooper Target". The Rude/Heck Report states that the bottom in the Hooper Target area is littered with debris and is extremely dangerous for divers. It thus appears that the "six feet above bottom" quote in the Navy EOD Report probably applies to the Hooper Target Area.

All plotting for this item was done on two Mylar sheets at 1:2500 scale. One sheet is labeled "Side Scan Coverage Plot" and was processed by the same technique as AWOIS Item No.'s 3424 and 3425. Refer to those items in this section for more detail. A second sheet was plotted

containing launch constant tension wire drag positions and effective coverage which also is colored for easy review. This sheet is labeled with AWOIS item number 3428 and titled "Constant Tension Wire Drag Coverage Plot". Recommend obstruction be removed from chart. A copy of the Navy EOD report follows. - See also section 7.a.3) of the Evaluation Report

FOR

EODGRUTWOINST 8027.4
16 OCTOBER 1979

EODGRUTWO FORM 8027/1 (4/79)

EXPLOSIVE ORDNANCE DISPOSAL REPORT

1. From: R.B. Lanning, LT 522 72 3248

2. To: Commander
Explosive Ordnance Disposal Group Two

REPORTING INFORMATION

3. Call Received from: (HCU-2 msg 161930 MAY 80)
LCDR Epperson, Staff Operations, EODGRUTWO
Ft. Story, Va

4. Time: 1100
Date: 12 APR 80

5. Item reported/description Removal of underwater hazards to navigation (Target Pilings)

6. Location/point of contact
Coordinator:
LT Gibson (Av 680-7404)
HCU-2

T.S.D. Division
Patuxent River MD
POC. Les Ryan (Av 356-4774)

RESPONSE INFORMATION

7. Personnel responding:
LT R.B. Lanning, 522 72 3248
GMGC P.R. Montgomery, 343 42 7645
MMC T.D. Clagett, 217 42 0329
GMGC T.F. Titcomb, 057 34 9310

8. Type incident:

VIP Support	
Routine pickup/disposal	
ACFT crash	
Range clearance	
Vehicle accident	
Test support	
R & D support	
Storage area incident	
Diving operation	XX
PIC operation	
Movement standby	
Enemy attack	
IED incident	
Actual device	
Hoax device	
Negative find	
Other:	

9. Time Expended:

	TIME	DATE
Departed	0545	16 JUN 80
Returned	1900	22 JUN 80
Total	7 days	XXXXXXXXX
Total man hours	10 hr/day	280 mh

10. Assistance provided to:

Local authorities	USN
Federal authorities	
Other military services	

11. Narrative: Removed seven (7) underwater navigational hazards at Patuxent River, MD. using Mk 8 Shape Charges and C-4

12. No. Items 7
Net Exp Wt NA
Gross Wt

13. Disposition: Removed all known existing structures at or below six feet from the bottom

14. Signature R B Lanning

15. Date: 23 JUN 80

16. a	b	c	d	e	f	g	h	i	j

17. Control Number
0182170041

Investigation for AWOIS Item No. 3433 began on J.D. 168 using Klein Associates Side Scan Sonar S/N 233-ID471. 400% coverage was achieved in a ½ mile radius circle centered on the charted position and no evidence of the wreck was found. The side scan record does show areas of different bottom texture, and some areas show numerous small contacts with little or no shadow. On J.D. 172, a chain drag investigation was done in an area of apparent rocky bottom. The chain immediately hung up on three consecutive drags. This indicates that the bottom is indeed rocky. Recommend removal of the wreck symbol, PA, from the chart. - See also section 7.a.5) of the Evaluation Report.

No "Side Scan Coverage Plot" was made for this item. The area was considered too large for a detailed coverage plot and therefore required a coverage abstract form prescribed in the Side Scan Users Guide. Each consecutive track has been logged showing effective coverage swaths made with the Side Scan Sonar. The abstract is filed in the side scan sonar cahier.

A charted sewer line under construction was investigated on J.D. 171 using NOAA Launch PE-2 (VESNO 2832) running at 2400rpm. The sewer line was easily recognizable by a deep ditch and the high pile of sediment off to the northern side of the ditch. The investigation involved running north - south lines with a spacing of 200 meters progressing eastward from the shore just south of the SEPTAR BASE. The investigation was plotted on the final field sheet showing the limits of the outer extension of the sewer line. Recommend that this item be charted as a submerged pipeline with appropriate symbol from ~~position 38°15'46"N LAT, 076°23'30"W LON, to position 38°15'30.1" LAT, 076°22'00"W LON~~. as built drawings submitted after completion of construction Least depths over the pipeline should be those shown on the final field sheet.

On 19 June 1984, the PEIRCE Operations Officer spoke with the Director of the St. Mary's County Metropolitian Commission, which operates the sewer line. He stated that the pipeline has been completed, and that design specifications call for the line to be buried five feet below the bottom. The outlet is a series of diffusers rising two feet above the bottom. These are located along the offshore 115 foot section of the line.

No further AWOIS items were investigated in this survey. Deficiency item report forms (see figure 4-55 of Hydrographic Manual) are included for each item investigated.

Comparisons were made with the following prior surveys, although this was not required by the project instructions:

REGISTRY NO.	SCALE	DATE
H-7092	1:10,000	March - May 1946
H-7093	1:10,000	April - May 1946
H-7094	1:20,000	Nov 1945 - Oct 1946
H-8279	1:10,000	Sept 1955 - Oct 1959
H-8283	1:20,000	Oct 1955 - June 1956

The prior surveys are one foot shoaler than this survey for about 90% of the soundings. Features and trends compare favorably from the prior surveys to this survey. The depth differences are probably because of the use of predicted tide correctors in this survey. In the area common with this survey, the prior surveys remain adequate for charting. - See sections 6.a. and 6.b. of the Evaluation Report.

L. COMPARISONS WITH THE CHART

Comparisons with the following charts were made:

CHART NUMBER	EDITION	EDITION DATE
12231	20th	May 22, 1983
12233	27th	May 28, 1983
12261	21st	February 12, 1983
12264	22nd	May 28, 1983

All charted soundings from the above charts were transfered onto an overlay and compared with the final field sheet. Comparisons of these charted soundings were observed to agree relatively well, showing a 70% agreement with the acquired soundings. Discrepancies of charted depths versus acquired depths occur in the range of the 35 to 45 feet, where charted depths are 1 to 2 feet shoaler than the soundings acquired in this survey.

It is believed that the current charts are adequate and no changes in charted soundings are recommended. - See section 6.a. of the Evaluation Report.

NOTE: An area charted as "Prohibited Area" on Chart 12233 is a ½ mile radius circle centered on position 38°13'00"N LAT, 076°19'00"W LON. This area is named "Hooper Target" and is a Naval bombing test site. Buoys WOr"C" and WOr"D" are in new positions. Chart them as shown on this survey at:

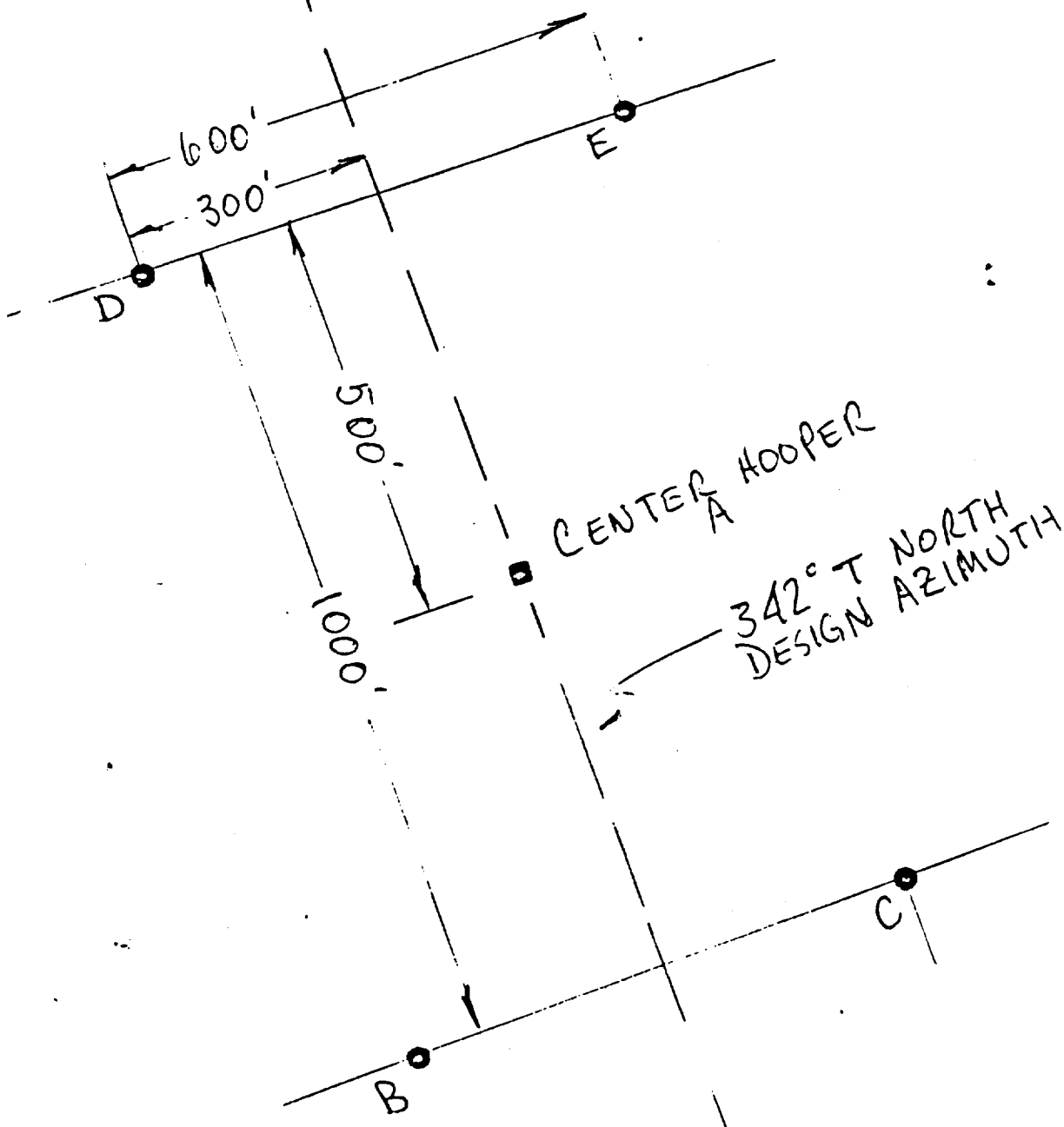
WOr "C"	38°13'07.9"N	076°18'18.1"W
WOr "D"	38°13'05.4"N	076°19'16.1"W

This area contains five (5) fixed targets, which were located by the tracking theodolites of the Patuxent River Naval Air Test Center. The enclosed sketch of the targets was also provided by the center. Chart targets in positions as follows:

TARGET LATITUDE	TARGET LONGITUDE
A 38°12'54.2"N	076°18'43.7"W
B 38°12'48.6"N	076°18'45.1"W
C 38°12'50.4"N	076°18'38.0"W
D 38°12'57.7"N	076°18'49.4"W
E 38°12'59.7"N	076°18'42.1"W

Based upon interviews with Mr. Les Ryan and upon the Explosive Ordinance Disposal Report included with the AWOIS items, recommend deletion of the charted TR, Target, markers and submerged obstructions in the "Prohibited Area". - See section 7.a.4) of the Evaluation Report.

TARGET	COORDINATES	
A	38° 12' 54.2"	76° 18' 43.7"
B	38° 12' 48.6"	76° 18' 45.1"
C	38° 12' 50.4"	76° 18' 38.0"
D	38° 12' 57.7"	76° 18' 49.4"
E	38° 12' 59.7"	76° 18' 42.1"



THESE WERE LOCATED USING THE CHESAPEAKE TEST RANGE MONUMENTS.

HOOPER TARGET

→K LEFT STATION:
Hooper Island
Lighthouse 1902
LAT&LON, EE/CSE:

LAT 38 DEG
15 MIN
22.14300 SEC
LON 76 DEG
15 MIN
0.41800 SEC

CSE 0.900 M

RIGHT STATION:
Cedar Falcon

LAT&LON, EE/CSE:

LAT 38 DEG
17 MIN
38.70200 SEC
LON 76 DEG
22 MIN
42.93200 SEC

CSE 0.050 M
→L DISTANCE
AND SIGMA

FROM LEFT STA:

DST 6344.000 M
SIGMA 2.000 M

FROM RIGHT STA:

DST 10543.000 M
SIGMA 2.000 M
TRILATERATED PT:
WOr "C"
Buoy

LAT 38 DEG
13 MIN
7.92297 SEC
LON 76 DEG
18 MIN
18.13181 SEC

ERROR ELLIPSE:

AZ-MAX 95.8 DEG
MAX 2.153 M
MIN 2.049 M

CSE 2.101 M

→K LEFT STATION:
Hooper Island
Lighthouse 1902
LAT&LON, EE/CSE:

LAT 38 DEG
15 MIN
22.14300 SEC
LON 76 DEG
15 MIN
0.41800 SEC

CSE 0.900 M

RIGHT STATION:
Cedar Falcon

LAT&LON, EE/CSE:

LAT 38 DEG
17 MIN
38.70200 SEC
LON 76 DEG
22 MIN
42.93200 SEC

CSE 0.050 M
→L DISTANCE
AND SIGMA

FROM LEFT STA:

DST 7512.000 M
SIGMA 2.000 M

FROM RIGHT STA:

DST 9814.000 M
SIGMA 2.000 M
TRILATERATED PT:
WOr "D"
Buoy

LAT 38 DEG
13 MIN
5.39041 SEC
LON 76 DEG
19 MIN
16.05501 SEC

ERROR ELLIPSE:

AZ-MAX 102.5 DEG
MAX 2.157 M
MIN 2.046 M

CSE 2.101 M

→K LEFT STATION:
Hooper Is LH

LAT&LON, EE/CSE:

LAT 38 DEG
15 MIN
22.14300 SEC
LON 76 DEG
15 MIN
0.41800 SEC

CSE 0.900 M

RIGHT STATION:
Cedar Falcon

LAT&LON, EE/CSE:

LAT 38 DEG
17 MIN
38.70200 SEC
LON 76 DEG
22 MIN
42.93200 SEC

CSE 0.050 M
→L DISTANCE
AND SIGMA

FROM LEFT STA:

DST 7093.000 M
SIGMA 2.000 M

FROM RIGHT STA:

DST 10525.000 M
SIGMA 2.000 M
TRILATERATED PT:
Hoopers Target "A"

LAT 38 DEG
12 MIN
54.18897 SEC
LON 76 DEG
18 MIN
43.74625 SEC

ERROR ELLIPSE:

AZ-MAX 98.2 DEG
MAX 2.218 M
MIN 2.000 M

CSE 2.106 M

CHART # 12233, 12230, 12285, 12220 ITEM # 3424

ITEM DESCRIPTION: Submerged object dangerous to navigation, cleared by wire drag to 39 feet.

SOURCE: FE11/51WD

INVESTIGATION DATE: 13 June 1984 TIME: VESSEL: 2831

OIC: ENS Maddox

REFERENCES:

Position No.: 125 Volume: NA

Sounding Correctors Applied: draft, instrument error, velocity

Tides (Predicted/~~Actual~~)

GEODETIC POSITION	Latitude	Longitude
Charted:	38° 05' 09.0" N	076° 14' 34.0"W
Observed:	38° 05' 08.6~~8~~" N	076° 14' 33.0~~8~~14" W

POSITION DETERMINED BY: Miniranger Falcon 484

METHOD OF ITEM INVESTIGATION:

Side scan sonar investigation found a contact 22 meters to the southeast of the charted position. Five passes were made on the object, and a least depth of 41 feet was obtained with the DSF-6000 echo sounder.

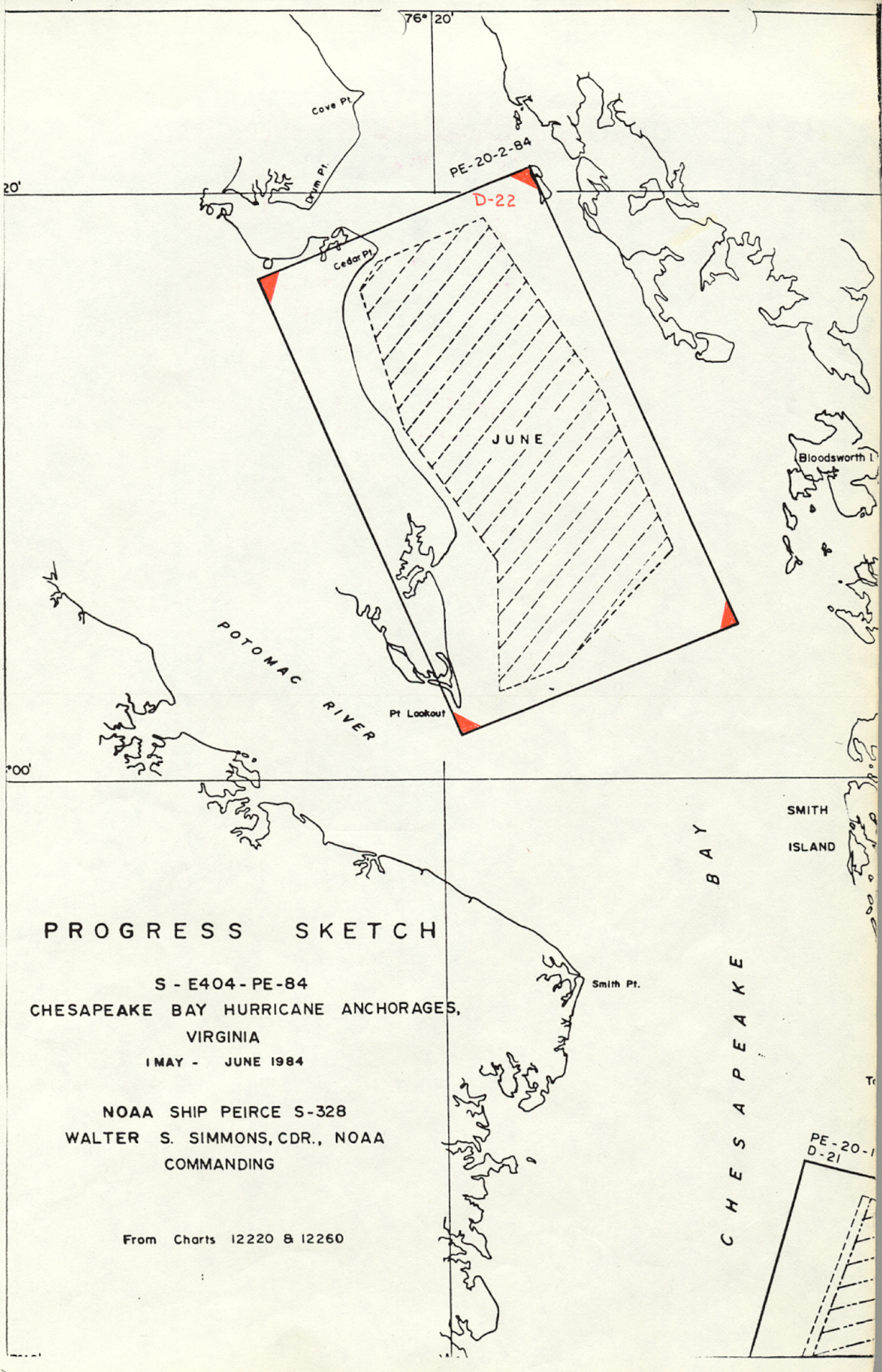
CHARTING RECOMMENDATION: - See section 6.b. of the Evaluation Report for FE-2755 (1985)

~~Retain the obstruction as presently charted.~~ Concur

Walter S. Simmons, CDR, NOAA
Commanding Officer

Compilation Use Only

CHART	APPLIED AS	DATE	COMPILER



PROGRESS SKETCH

S - E404 - PE-84

CHESAPEAKE BAY HURRICANE ANCHORAGES, VIRGINIA

1 MAY - JUNE 1984

NOAA SHIP PEIRCE S-328

WALTER S. SIMMONS, CDR., NOAA

COMMANDING

From Charts 12220 & 12260

CHART #12233, 12230, 12285, 12220 ITEM #3425

ITEM DESCRIPTION: Submerged object dangerous to navigation, cleared by wire drag to 37 feet.

SOURCE: FE11/51WD

INVESTIGATION DATE: 12, 13 June 1984 TIME: VESSEL: 2831
JD 164 and 165

OIC: ENS Maddox

REFERENCES:

Position No.: 89 and 90, 93 and 94 Volume: NA

Sounding Correctors Applied: draft, instrument error, velocity

Tides (Predicted/~~XXXXXX~~)

GEODETIC POSITION		Latitude	Longitude
Charted:	object #1	38° 05' 23.0" N	076° 15' 06.0" W
	object #2	38° 05' 21.0" N	076 15' 08.0" W
Observed:	object #1	38° 05' ~~23.6~~ 24.8" N	076° 15' 03.~~9~~ 8" W
	object #2	38° 05' ~~20.0~~ 19.9" N	076° 15' 01.7" W

POSITION DETERMINED BY: Miniranger Falcon

METHOD OF ITEM INVESTIGATION:

This item consists of two obstructions, although charted as a single item. Two obstructions were located by side scan sonar and echo sounder search at 110 and 62 meters from the positions given in AWOIS 3425 printout dated April 11, 1984. Side scan search lines were run normal to the initial lines to verify that there were only two objects in the area. Least depths of 43 and 40 feet were obtained by echo sounder for objects 1 and 2, respectively.

CHARTING RECOMMENDATION: - See section 6.B.a of the Evaluation Report for FE-275(SS)(1983).

~~Retain the obstruction as presently charted.~~ Concur

Walter S. Simmons, CDR, NOAA
Commanding Officer

Compilation Use Only

CHART	APPLIED AS	DATE	COMPILER

CHART # 12233, 12230, 12285, 12220, 12260 ITEM # 3426

ITEM DESCRIPTION: 18 foot charted sounding

SOURCE: survey H-8279 (1955)

INVESTIGATION DATE: 14 June 1984 JD 166 TIME: VESSEL: 2831

OIC: ENS Maddox

REFERENCES:

Position No.: 261 to 283 Volume: NA

Sounding Correctors Applied: draft, instrument error, velocity

Tides (Predicted/~~Actual~~)

GEODETIC POSITION	Latitude	Longitude
Charted:	38° 07' 43.80" N	076° 17' 26.10" W
Observed:	38° 07' 44.0 " N	076° 17' 24.4 " W

POSITION DETERMINED BY:

Miniranger Falcon 484

METHOD OF ITEM INVESTIGATION:

This charted 18 foot sounding was developed by 10 meter spaced lines using a DSF-6000 echo sounder. - See sections 3.c. and 4.e. of the Evaluation Report.

CHARTING RECOMMENDATION: - See section 7.a.1) of the Evaluation Report

~~Chart an 18 foot sounding at the above observed position.~~

Walter S. Simmons, CDR, NOAA
Commanding Officer

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CHART	APPLIED AS	DATE	COMPILER

CHART # 12233, 12230, 12285, 12260 ITEM # 3427

ITEM DESCRIPTION: Dangerous wreck of a 23 foot boat, position approximate.

SOURCE: unknown (as stated in AWOIS 3427 printout of April 11, 1984)

INVESTIGATION DATE: 14 June 1984 TIME: VESSEL: 2831
JD 166

OIC: LT Ross

REFERENCES:

Position No.: Side scan positions 155-260 Volume: NA

Sounding Correctors Applied: NA

Tides (Predicted/Actual) NA

GEODETIC POSITION	Latitude	Longitude
Charted:	38° 09' 36" N	076° 18' 00" W
Observed:	NA	NA

POSITION DETERMINED BY: Side scan control by Miniranger Falcon 484.

METHOD OF ITEM INVESTIGATION:

A side scan sonar investigation was made, consisting of 400% coverage in a 250m radius circle centered on the charted position. No evidence of the wreck was found.

CHARTING RECOMMENDATION: - See section 7.a.2) of the Evaluation Report.

~~Remove the wreck symbol from the chart.~~

Walter S. Simmons, CDR, NOAA
Commanding Officer

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CHART	APPLIED AS	DATE	COMPILER

CHART # 12233, 12230, 12260 ITEM # 3428

ITEM DESCRIPTION: Submerged obstruction

SOURCE: CL1382/80 , OPR-E609-RU/HE-78

INVESTIGATION DATE: 18, 19, 21 June 84 TIME: VESSEL: 2831, 2832, 2833

OIC: LT Waltz

REFERENCES:

Position No.: Side scan positions 372-393
Wire drag positions 431-440 Volume: NA

Sounding Correctors Applied: NA

Tides (Predicted/Actual) NA

GEODETIC POSITION	Latitude	Longitude
Charted:	38° 14' 07.8" N	076° 20 18.0" W
Observed:	NA	NA

POSITION DETERMINED BY: all search control by Miniranger Falcon 484

METHOD OF ITEM INVESTIGATION:

On 18 June, 1984, a 200% side scan sonar coverage was achieved within a 100m radius circle centered on the reported position of this obstruction. The side scan record revealed a very small object, which showed a shadow less than one meter in length. This object plotted about 50 meters to the NNW of the charted position of the obstruction. On 19 June a launch constant-tension wire drag was conducted to about fifty meters north and south of the sonar contact, with an effective depth of 33 feet. The wire drag operation unfortunately left a holiday directly over the contact's position, and the wire drag search was not resumed because of adverse weather. A star (continued)

CHARTING RECOMMENDATION: - See section 7.a.3) of the Evaluation Report

~~Remove the obstruction from the chart. - Concur~~.

Walter S. Simmons, CDR, NOAA
Commanding Officer

Compilation Use Only

CHART	APPLIED AS	DATE	COMPILER

pattern echo sounder search was conducted over the position on 21 June with negative results.

On 18 June the PEIRCE Ops Officer visited Mr. Les Ryan, Director of the Patuxent River Naval Air Test Center Target Support Group (SEPTAR BASE). He reported that the charted submerged obstruction was the remains of what is locally known as "Bat Target", which was a lighted single pile structure. This target was destroyed by ice in the late 1970's, but the submerged piling remained with a least depth of about 15 feet. He recalled that in 1980 a Navy/NOS dive team located the pile and secured a 55 gallon drum float to it. He also recalled that about two weeks later a Navy EOD team removed the obstruction "at the mud line" using explosives. He produced a copy of the EOD team report, which states that several targets were removed on the operation, and that all explosive charges were placed no higher than six feet above the bottom.

The Rude/Heck chart letter (CL1382-80), which reported this obstruction, also mentions that other submerged destroyed targets were located by NOS divers. These are located to the SSE of "Bat Target" in an area known locally as "Hooper Target". The Rude/Heck report states that the bottom in the Hooper Target area is littered with debris and is extremely dangerous for divers. It thus appears that the "sixfeet above bottom" quote in the Navy EOD report probably applies to the Hooper Target area.

CHART # 12264, 12230, 12260 ITEM # 3433

ITEM DESCRIPTION: Submerged dangerous wreck, PA

SOURCE: NM33/54 (as reported on AWOIS 3433 printout, 11 April 1984)

INVESTIGATION DATE: JD 168, 170, 172, 173. TIME: VESSEL: 2831, 2832, 2833

OIC: LT Ross

REFERENCES:

Position No.: 313 to 371, 394 to 430, 441 to 591, and 594 to 735. Volume: NA

Sounding Correctors Applied: NA

Tides (Predicted/Actual) NA

GEODETIC POSITION	Latitude	Longitude
Charted:	38° 16' 16" N	076° 22' 27" W
Observed:	NA	NA

POSITION DETERMINED BY: Side scan sonar search and chain drag search controlled by Miniranger Falcon 484.

METHOD OF ITEM INVESTIGATION:

A side scan sonar investigation of this charted wreck of the schooner "Squarehead" was begun on 16 June 1984. 400% side scan sonar coverage was achieved on the item with negative results. The side scan record does show areas of different bottom texture, and some areas show numerous small contacts with little or no shadow. On 20 June, a chain drag investigation was done in an area of apparent rocky bottom. The chain immediately hung up on each of three sets. This indicates that the bottom is indeed rocky.

CHARTING RECOMMENDATION: - See also section 7.a.5) of the Evaluation Report.

~~Remove the wreck symbol, PA, from the chart.~~

Walter S. Simmons, CDR, NOAA
Commanding Officer

Compilation Use Only

CHART	APPLIED AS	DATE	COMPILER

There were no reports of dangers to navigation transmitted to the U.S. Coast Guard.

M. ADEQUACY OF SURVEY

This chart evaluation survey is complete and conforms to the project instructions for S-E404-PE84. As with any chart evaluation survey, the present survey is not adequate to supercede prior soundings for charting. No further field work is required at this time..

N. AIDS TO NAVIGATION

The following landmarks, which are visible from the survey area, were observed and verified as presently charted.

CHARTED AS	CHARTED POSITION	
Aband Lt Ho. (In Ruins)	38°17'57.41"N	076°22'04.94"W
TR	38°17'46.502"N	076°22'43.794"W
Dome	38°17'04.057"N	076°23'18.097"W
Dome	38°15'52.716"N	076°24'00.883"W
Dome	38°13'16.440"N	076°23'14.481"W
Dome	38°11'40.915"N	076°21'54.397"W
Tower	38°08'25.623"N	076°19'22.109"W
Point No Point Lt.	38°07'40.626"N	076°17'26.322"W
Holland Island Bar Lt.	38°04'06.918"N	076°05'46.131"W
Hooper Island Lt.	38°15'22.143"N	076°15'00.418"W
Point Lookout Lt.	38°01'35.70"N	076°19'20.80"W

Form 76-40 has been submitted to delete two landmarks from the charts.

Positions of the following floating aids to navigation were not determined during the survey.

BW "HS" Mo(A) Bell
BW "PR" IQK FL G

All other floating aids in the survey area were located, and their positions and characteristics compared with the largest scale chart of the area and the U.S. Coast Guard Light List. Buoys WOr"C" and WOr"D" at the U.S. Navy "Hooper Target" prohibited area (38°13'00"N, 076°19'00"W) are in new positions. ~~and should be charted as shown on this survey.~~ Buoys should be charted as per appropriate Local Notices to Mariner.

O. STATISTICS

	VESNO 2830	VESNO 2831	VESNO 2832	TOTAL
Total Number of Positions	398	729	525	1652
Nautical Miles of Sounding Lines	132.5	13.0	133.7	279.2
Nautical Miles of Side Scan Sonar		54.9		54.9
Square Miles of Hydrography				72
Bottom Samples	38		4	42
Settlement and Squat	1	1	1	3
Martek Cast	1			1
Bar Checks		4	4	8

P. MISCELLANEOUS

Thirty-eight bottom samples were taken, and a copy of the Oceanographic Log Sheet-M is included in Appendix "H" of this report. No report on tidal currents in the area has been submitted. No malfunctioning of the ship's Loran-C receiver was observed for Loran data collected during this survey. Comparison of currents to predictions revealed no anomolies.

Q. RECOMMENDATIONS

Refer to section K for special recommendations. The hydrographer recommends that no additional field work be done in the survey area. - See sections 6.a. and 7.a.1) of the Evaluation Report.

R. AUTOMATED DATA PROCESSING

The following programs were used in acquiring and processing data for this survey:

PROGRAM	PROGRAM NAME	VERSION
RK112	R/R Hydroplot	10/12/83
RK201	Grid, Signal, Lattice Plot	4/18/75
RK211	R/R Non-Real Time Plot	2/13/84
RK300	Utility Computations	10/21/80
RK330	Reformat and Data Check	5/04/76
PM360	Electronic Corrector Abstract	2/02/76
RK500	Predicted Tide Generator	11/10/72
RK530	Layer Corrections for Velocity	5/10/76
RK561	H/R Geodetic Calibration	12/01/82
AM602	Elinore-Extended Line Oriented Editor	12/08/82
RK612	Line Printer List	3/22/78

S. REFERRAL TO REPORTS

The following reports for Project S-E404-PE-84 have been submitted.

REPORTS

Coast Pilot, S-E404-PE-84

Horizontal Control Report, S-E404-PE-84

Respectfully submitted:

Jason H. Maddox

APPENDIX F

LIST OF STATIONS

SIGNAL TAPE LISTING

036	5	38	11	40915	076	21	54398	139	0012	000000	Bay Forest Inst., 1977
037	5	38	17	38683	076	22	43087	139	0012	000000	Cedar Pt Inst.,1977
040	5	38	13	16440	076	23	14481	139	0013	000000	Chesapeake Inst.,1977
041	5	38	08	25790	076	19	21436	139	0011	000000	Pt No Pt Inst.,1977
042	5	38	15	52716	076	24	00883	139	0012	000000	Pylon Inst.,1977
043	7	38	15	22143	076	15	00418	250	0000	000000	Hooper Island Lighthouse,1902
044	7	38	04	06908	076	05	46161	250	0000	000000	Holland Island Bar LH,1897
045	5	38	07	40626	076	17	26322	250	0000	000000	Point No Point LH, 1905
046	5	38	02	19108	076	19	20517	250	0000	000000	Point Lookout Lighthouse,1846
047	0	38	17	38~~648~~ 702	076	22	4~~3188~~ 2932	254	0018	000000	Cedar Falcon,1984

GFT
12/8/84

DEFENSE MAPPING AGENCY
TOPOGRAPHIC CENTER
GEODETIC SURVEY SQUADRON
FE WARREN AFB, WYOMING 82001

GARY DOBSON
BILL EDWARDS *
PAX R NAS

863-1188
BLDG 1406

14 NOV 1977

DMATC-GS(52220)

SUBJECT: Final Data, Geodetic Survey, NATC, Patuxent River, Maryland

TO: Commander
Naval Air Test Center
TSD/CTR (Bldg 1406, ATTN: S. F. Woodard)
Patuxent River, Maryland 20670

1. Enclosed are three copies of a booklet pertaining to subject survey. Each booklet consists of:

a. Facility Data Sheet (FDS) No. 238 which contains the results of the horizontal and vertical surveys accomplished by the Geodetic Survey Squadron (GSS).

(1) Part I: Adjusted NAD 1927 positions and SLD 1929 elevations

(2) Part II: Datum conversion NAD 1927 to WGS 72

(3) Part III: Local rectangular space coordinates

(4) Part IV: State Lambert projection transformations

(5) Part V: Geodetic to UTM conversion

(6) Part VI: Standard errors of adjusted azimuths and distances

(7) Part VII: Azimuths and distances on WGS 72

(8) Part VIII: Slant range data including true and apparent vertical angles

(9) Part IX: Estimated survey accuracies by stations and areas.

b. FDS No. 238-A which contains the geodetic data in use prior to publication of the above GSS results.

c. An analysis of the results of the precise survey which includes:

(1) Survey requirements

(2) Field procedures

(3) Vertical/horizontal control data computations and adjustment procedures.

d. Horizontal control station descriptions with a survey scheme and calibration targets sketches.

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e. Vertical control bench mark descriptions.

2. The accuracy requirements for geodetic coordinates and elevations for the instrumentation sites were achieved. All accuracy requirements for distances were also met. The azimuth accuracy requirement, ±2 arc seconds, was not achieved for Cedar Point Lighthouse due to inability to clearly define a target point. On some of the overwater lines, vertical angle accuracy requirement, ±5.0 arc seconds, was not achieved due to refraction effects.

3. Please direct any inquiries concerning this data to Mr. Thomas Perrott, AUTOVON 481-2281 or Area Code 307 775-2281.

FOR THE COMMANDER:

Gordon L. Barnes

GORDON L. BARNES
Lieutenant Colonel, USAF
Deputy Commander for Operations

cc:
NGS
DMATC-TS(50250)
DMATC-GS(52000) w/o encl
DMA/PPS w/o encl
AFIS/INTB w/o encl

OPTIONAL FORM NO. 10
JULY 1973 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

: C/DA

DATE: 2 NOV 1977

: DA Projects (52270)

Mr. Perrott/amb/2231

: Final Analysis and Report of Geodetic Surveys for Naval Air Test Center (NATC), Chesapeake Test Range (CTR), Patuxent River, Maryland

1. Introduction: This analysis and report covers the 1976 and 1977 conventional, astronomic and Doppler geodetic surveys and computations accomplished to provide precision space position data during testing and evaluation of Naval aircraft. Instrumentation sites and stations surveyed include five photo-theodolite crackers and related stations located between Cedar Point and Point No Point, five calibration targets including two lighthouses located in the bay, one Automatic Laser Tracking System (ALTS), nine stations in the Cedar Point area, four NGS first order stations, one Maryland Geodetic Survey station (LOOK 1976), and four stations on Webster Field including one GAEC station.

2. Requirements:

a. Geodetic coordinates of instrumentation points on both Clarke 1866 (NAD 27) and WGS 72 to 0.1 meter, Circular Standard Error (CSE), relative to NGS first order station CEDAR POINT 2.

b. Elevation of instrumentation points on SLD 1929 to $\pm$0.03 meter, Standard Error (SE), relative to local NGS first order vertical control.

c. Geodetic azimuths to $\pm$2.0 arc seconds, SE, relative to geodetic north.

d. Geodetic distances and slant ranges to $\pm$0.08 meters, SE.

e. Apparent vertical angles to $\pm$5.0 arc seconds, SE.

3. Extension of Horizontal Control: Horizontal control was extended from NGS first order station CEDAR POINT 2 to the required instrumentation sites and stations by a combination of triangulation and precise traverse methods and procedures. Azimuth control for survey net orientation was obtained by observing 14 first order, three second order, and two third order astro/Laplace azimuths at stations CEDAR POINT 2, WEBSTER, ROWE, POINT NO POINT 2 RM3, TUCKERMAN, and D13. Four main scheme lines had reciprocal azimuths observed over them with an average forward/backward agreement of 2.1 arc seconds and a maximum of 3.2 arc seconds after applying convergence. In 1976, 12

distances were measured by NATC and GSS personnel using a Ranger 4 in a survey to position an ALTS station and six targets in the Cedar Point area. In the 1977 precise survey, 13 distances were measured by a combination of Models 8 and 6BL Geodimeters with an average difference of 0.025 meters and a maximum of 0.059 meters, three distances were measured by Model 6BL Geodimeter, 15 distances by MA 100 Tellurometer, and 10 distances were taped. The total number of actual individual distance measurements was 195; 76 by Model 8 Geodimeter, 57 by Model 6BL Geodimeter, 30 by MA 100 Tellurometer, 22 by Ranger 4, and 10 by 30-meter steel tape. In the 1976 survey, 13 sets of 6-positions horizontal directions were observed at nine different stations for a total of 38 directions. In the 1977 precise survey, 16 sets of 16-positions horizontal directions were observed using Wild T-3 theodolites at eight different stations for a total of 62 directions. In addition, three 10-positions directions to calibration targets and 24 4-positions directions to reference marks, etc., were observed. The total number of actual individual horizontal directions observed was 127.

4. Astronomic Positions: Astronomic positions were observed at stations CEDAR POINT 2, POINT NO POINT 2 RM3, and TUCKERMAN. The purpose was to provide astro/geodetic deflection of the vertical data in order to correct observed horizontal directions and azimuths from the normal to the geoid (plumb line) to the perpendicular to the ellipsoid, and to correct astro azimuths for the astro to geodetic meridian or Laplace correction. Following is a summary of the observed astro positions after reduction in the GSS IBM 7040/7094 electronic computer:

Station		Order	Sets	Stars	Standard Error Seconds
CEDAR PT 2	Latitude	2nd	3	21	0.24
	Longitude	Mod. 1st	3	18	0.08
PT NO PT 2 RM3	Latitude	Mod. 1st	4	29	0.14
	Longitude	Mod. 1st	3	18	0.09
TUCKERMAN	Latitude	Mod. 1st	4	32	0.16
	Longitude	Mod. 1st	3	18	0.09

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SUBJECT: Final Analysis and Report of Geodetic Surveys for Naval Air Test Center (NATC), Chesapeake Test Range (CTR), Patuxent River, Maryland

5. JMR Doppler Observations: JMR-1 Doppler Survey Sets were utilized at stations CEDAR POINT 2, POINT NO POINT 2, and TUCKERMAN to collect data by tracking four Navy Navigation Satellites (58, 60, 63 and 77). The collected passes data were processed and reduced in the electronic computer using precise ephemerides and the CSS Long Arc JMR Adjustment Point Position Solution program. An average of 63 passes were collected with an average of 58 passes retained in the reduction process. The purpose was to provide NAD 27 to WGS 72 datum shift data to compute WGS 72 earth mass centered geodetic coordinates for all stations to within an estimated 0.9 meter standard error in each component relative to the WGS 72 datum.

6. Extension of Vertical Control:

a. Vertical control was extended from NGS first order bench marks RESET, TIDAL 1, TIDAL 6, WO-9, WO-24, X-134 and Y-134 to 72 stations, bench marks, instrument axes, reference marks, etc. Precise differential leveling methods and procedures were used which included Wild N-3 Geodetic Levels, Gurley 3.25-meter Leveling Rods, forward/backward runs, 3-wire observations, C-factor determinations and temperature observations.

b. Vertical control was also extended from seven stations which were established in the differential leveling to the five calibration targets in the bay and six stations in the Cedar Point area by redundant vertical angle observations. The vertical angles were observed using Wild T-3 theodolites with four independent determinations of each angle.

7. NAD 27 (Clarke 1866) Geoid and Ellipsoid Heights: NAD 27 geoid heights were obtained by a combination of Doppler-derived and astro/geodetic curve fit computed values. The Doppler-derived values were determined by applying known WGS 72 to NAD 27 X, Y, Z shifts at NAD 27 origin station MEADES RANCH to the observed WGS 72 coordinates on the range and then algebraically subtracting the SLD 29 elevation from the computed ellipsoid height.

8. Vertical Computations and Adjustments:

a. Differential Leveling - The observed differences in elevation were modified for C-factor, temperature and rod-calibration prior to final computations. The corrected observed differences in elevation

were then adjusted by least squares in the electronic computer using the GSS Level Line Adjustment program. The NGS published SLD 29 elevations of seven bench marks were held fixed in the adjustment which contained 72 unknowns and 179 equations, with a resulting standard error of a single observation of unit weight of 1.22. The average internal standard error of an adjusted elevation was ±0.0026 meters with a maximum of 0.0061 meters for BAY FOREST INST. The average residual to an observed difference in elevation was 0.0019 meters with a maximum of 0.0337 meters (which was reobserved).

b. Vertical Angle Leveling - The vertical angle leveling consisting of the observed vertical angles was computed and adjusted by least squares in the electronic computer using the GSS VERTAN program. The GSS adjusted SLD 29 elevations of seven stations were held fixed in the adjustment which contained 11 unknowns and 30 observations with a resulting standard error of a single observation of unit weight of 0.87. A refraction value of -2.27 arc seconds per kilometer (correlating to a standard coefficient of refraction of 0.07) was applied to the non-reciprocal vertical angles observed to the bay targets. The average internal standard error of an adjusted elevation was ±0.141 meters with a maximum of 0.374 meters at HOOPER LIGHT HOUSE. The average residual to an observed vertical angle was 7.9 arc seconds with a maximum of 33.6 arc seconds over a 525 meter line.

9. Horizontal Computations and Adjustments: The observed astronomic positions and azimuths, and JMR-1 Doppler observations were computed and reduced in the electronic computer prior to the horizontal computations. The entire horizontal survey consisting of both the 1976 and 1977 observations and measurements, given appropriate standard error weight codes, was computed and adjusted by least squares in the computer using the Horizontal Adjustment by Variation of Coordinates (HAVOC) program. The NGS published NAD 27 geodetic position of station CEDAR POINT 2 was held fixed in the adjustment which contained 139 unknowns and 229 equations, with a resulting standard error of a single observation of unit weight of 1.00. Included in the data were elevations, geoid heights, astronomic positions, deflection of the vertical components, horizontal directions, slope distances and instrument/target heights, astronomic azimuths, and NAD 27 to WGS 72 transformation data. The average internal circular standard error of an adjusted geodetic position relative to station CEDAR POINT 2 was 0.02 meters with a maximum of 0.06 meters for HOOPER LIGHT HOUSE. The average residual to an observed direction was 1.6 arc seconds with a maximum of 13.7 arc seconds from CEDAR POINT 2 to NW TARGET. The

average residual to a measured distance was 0.012 meters with a maximum of 0.045 meters between POINT NO POINT 2 RM3 and TUCKERMAN. The average residual to an astro azimuth was 0.76 arc seconds with a maximum of 1.70 arc seconds. The average internal standard error of an adjusted azimuth in the primary net (excluding reference marks and other short distance lines) was ±1.04 arc seconds and of an adjusted geodetic distance was ±0.024 meters.

10. Final Data Sheets:

a. Facility Data Sheet No. 238 - The final values published on FDS No. 238 represent the results of the precise horizontal and vertical surveys accomplished by the Geodetic Survey Squadron.

b. Facility Data Sheet No. 238-A - The values published on FDS No. 238-A represent the data which were being utilized prior to the publication of the GSS results.

11. Analysis of Results:

a. Comparison of GSS adjusted and NGS published values:

(1) The average latitude difference was 0.09 meters with a maximum of 0.18 meters at COLLISON.

(2) The average longitude difference was 0.19 meter with a maximum of 0.30 meter at TUCKERMAN.

(3) The average azimuth difference was 2.1 arc seconds with a maximum of 3.6 arc seconds (CEDAR POINT 2 to CEDAR POINT LIGHT HOUSE).

(4) The average distance difference was 0.19 meter with a maximum of 0.40 meter (COLLISON to POINT NO POINT 2).

b. Comparison of GSS adjusted and NATC values:

(1) The average latitude difference was 0.2 meter with a maximum of 0.6 meter at NW TARGET.

(2) The average longitude difference was 0.2 meter with a maximum of 0.6 meter at POINT NO POINT INST.

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(3) The average elevation difference was 1.24 meters with a maximum of 6.22 meters at BAT TARGET.

(4) The average azimuth difference was 9.6 arc seconds with a maximum of 43.3 arc seconds (CEDAR POINT INST to CEDAR POINT LIGHT HOUSE).

(5) The average distance or slant range difference was 0.28 meter with a maximum of 0.94 meter (CEDAR POINT INST to NW TARGET).

(6) The average vertical angle difference was 01'05" with a maximum of 04'42" (CHESAPEAKE INST to BAT TARGET).

Thomas A. Perrott
THOMAS A. PERROTT
NATC Project Officer
Data Acquisition Branch

Robert S. Keenan
ROBERT S. KEENAN
Assistant Chief
Data Acquisition Branch

DMATC/GEODETIC SURVEY SQ F.E.WARREN AFB,WYOMING 82001
COMPUTATIONAL DATE 25 OCT 1977
TIME 10 13 20.0

PDS NO. 233
PAGE 1 OF 17 PAGES
DATE: 1 NOVEMBER 1977

PROJECT NATC PATUXENT,MD

ELLIPSOID CLARKE 1866

NUMBER OF DIRECTION EQ.	127	NUMBER OF UNKNOWNS IN ADJ.	139
NUMBER OF DISTANCE EQ.	83	NUMBER OF ITERATIONS	1
NUMBER OF AZIMUTH EQ.	19	STANDARD ERROR OF UNIT WEIGHT	1.000
NUMBER OF CONSTRAINT EQ.	0	AZIMUTHS FROM NORTH	
TOTAL NUMBER OF EQUATIONS	229	**APPROXIMATE ELEVATION	

PART I

	NAD 1927 ADJUSTED POSITIONS LATITUDE	LONGITUDE	STANDARD ERROR LAT.	STANDARD ERROR LONG.	SLD 1929 ELEVATIONS METERS	FEET	GEOID HT. METERS	DEFLEC. COMPONENTS MC.	PVC
CEDAR PT 2			FIXED		2.027	9.273	-4.98	4.36S	7.85E
WALLOPS IS FPS-16	37 50 49.43100N	75 29 31.90700W	FIXED		12.375	40.600	-6.71		
WALLOPS IS FPQ-6	37 50 26.38700N	75 29 7.62300W	FIXED		14.966	49.101	-6.71		
WALLOPS IS MPS-19A	37 50 29.53100N	75 29 34.76700W	FIXED		-7.711	25.299	-6.71		
WALLOPS IS MPS-19W	37 50 29.38200N	75 29 5.95300W	FIXED		7.742	25.400	-6.71		
ALTS	38 17 7.17399N	76 24 6.14700W	FIXED		9.449	31.001	-4.98		
BAT TARGET	38 14 15.97406N	76 24 15.60193W	0.00065	0.00124	6.216	20.394	-4.98		
BAY FOREST INST	38 11 40.91549N	76 20 24.68591W	0.00064	0.00066	11.903	39.047	-4.88		
BAY FOREST THEOD	38 11 40.98700N	76 21 54.39777W	0.00031	0.00141	2.810	9.219	-4.81		
BAY FOREST RM-1	38 11 40.40573N	76 21 53.52965W	0.00030	0.00140	2.253	7.392	-4.81	3.00S	7.90E
BAY FOREST RM-2	38 11 41.47613N	76 21 54.60853W	0.00030	0.00140	2.894	9.495	-4.81		
BM LTR 6	38 17 46.25210N	76 22 36.34428W	0.00015	0.00018	2.002	9.193	-4.91		
CEDAR PT INST	38 17 57.39551N	76 22 43.03701W	0.00029	0.00041	11.505	37.746	-4.98		
CEDAR PT LT HOUSE	38 17 36.68399N	76 22 4.92779W	0.00066	0.00041	15.856	52.021	-4.98		
CEDAR PT THEOD	38 17 38.75400N	76 22 41.12560W	0.00015	0.00016	9.560	31.365	-4.99		
CEDAR PT 2 RM4	38 17 30.07400N	76 22 34.20952W	0.00007	0.00009	3.207	10.620	-4.98		
CHESAPEAKE INST	38 13 16.44010N	76 23 14.44123W	0.00028	0.00088	12.782	41.936	-4.98		
CHESAPEAKE THEOD	38 13 17.13181N	76 23 14.58071W	0.00022	0.00087	3.036	9.954	-4.85		
CHESAPEAKE RM-1	38 13 16.72022N	76 23 14.07998W	0.00023	0.00088	3.082	10.112	-4.85	3.40S	7.90E
CHESAPEAKE RM-2	38 13 16.46730N	76 23 14.67831W	0.00023	0.00048	3.246	10.978	-4.85		
COLLISON	38 15 30.74803N	76 26 7.46392W	0.00043	0.00048	35.111	115.193	-4.85		
COLLISON RM-1	38 15 32.04504N	76 26 7.57441W	0.00046	0.00052	35.338	115.938	-4.92	3.80S	7.90E
COLLISON RM-2	38 15 30.09468N	76 26 8.82067W	0.00046	0.00053	35.543	116.611	-4.92		
D13	38 17 7.39240N	76 24 21.98259W	0.00193	0.00168	5.346	17.539	-4.92		
FL	38 17 14.20415N	76 24 30.62547W	0.00214	0.00178	5.444	17.861	-4.97	4.20S	7.90E
HOOPER LT HOUSE	38 15 22.14452N	76 15 0.60027W	0.00126	0.00308	20.129	66.040	-4.97	4.20S	7.90E
HOOPER TARGET	38 13 [illegible]	76 19 [illegible]	0.00075	0.00147	8.569	28.113	-4.91		
LOOK	38 2 23.47579N	76 19 9.21347W	0.00056	0.00189	1.422	4.665	-4.85		
MAI	38 18 6.99732N	76 19 22.21367W	0.00076	0.00303	5.448	17.874	-5.01		
NW TARGET	38 13 [illegible]	76 22 49.59130W	0.00079	0.00152	6.728	22.073	-4.99	4.40S	7.90E
PT NO PT 2	38 8 30.49102N	76 19 [illegible]	0.00048	0.00129	2.266	7.434	-4.85		
PT NO PT INST	38 8 25.79045N	76 19 22.88106W	0.00047	0.00129	11.265	36.959	-4.71	2.32S	7.95E
PT NO PT 2 RM3	38 8 25.62321N	76 19 41.43569W	0.00047	0.00129	1.602	5.256	-4.71		
PYLON INST	38 15 52.71610N	76 24 0.88309W	0.00024	0.00041	11.774	38.629	-4.71	2.32S	7.95E
PYLON THEOD	38 15 53.36446N	76 23 58.31207W	0.00023	0.00036	2.526	8.287	-4.93		
PYLON RM-1	38 15 53.82038N	76 23 58.69240W	0.00024	0.00037	3.052	10.013	-4.93	3.90S	7.90E
PYLON RM-2	38 15 52.93634N	76 23 58.64922W	0.00024	0.00037	3.419	11.217	-4.93		
ROAL	38 12 41.79560N	76 26 4.1 720W	0.00044	0.00098	34.282	112.474	-4.93		
ROAL RM-1	38 12 40.86214N	76 26 2.71627W	0.00046	0.00100	34.705	113.861	-4.84	3.20S	7.90E
ROAL RM-2	38 12 43.10285N	76 26 5.70774W	0.00046	0.00099	33.930	111.319	-4.84		
RUNWAY 31	38 16 39.61280N	76 23 41.43271W	0.00105	0.00174	3.721	12.208	-4.84		
TP1	38 17 27.13156N	76 22 50.82010W	0.00071	0.00106	2.571	8.435	-4.95	4.10S	7.90E
TP3	38 18 5.35882N	76 23 4.53882W	0.00090	0.00299	6.242	20.479	-4.98	4.10S	7.90E
TUCKERMAN	38 3 0.50286N	76 19 41.62390W	0.00052	0.00180	6.076	2.874	-4.98	4.10S	7.90E
TUCKERMAN RM1	38 3 1.34592N	76 19 40.78967W	0.00053	0.00181	0.864	2.835	-5.70	2.18S	8.69E
TUCKERMAN RM3	38 2 59.65449N	76 19 40.72894W	0.00053	0.00181	0.870*	2.854*	-5.70		
WEL	38 17 55.20844N	76 22 35.78852W	0.00012	0.00024	2.815	9.245	-5.70		
WE2	38 17 56.91317N	76 22 42.11629W	0.00025	0.00047	1.764	5.787	-4.98	4.10S	7.90E
WEBSTER	38 17 55.63588N	76 25 39.08790W	0.00016	0.00016	3.084	10.118	-4.98	4.10S	7.90E
WEBSTER AZ MK	38 9 7.23499N	76 25 52.04295W	0.00047	0.00126	4.525	14.846	-4.98		
WEBSTER AZ-1(GAEC)	38 9 52.22907N	76 25 44.30651W	0.00056	0.00127	4.953	16.250	-4.73	2.50S	7.90E
WEBSTER RM-2	38 9 7.30116N	76 25 50.90309W	0.00047	0.00125	4.554	14.941	-4.73		
	38 9 8.97838N	76 25 52.76054W	0.00049	0.00126	4.318	14.167	-4.73		

APPENDIX I

LANDMARKS FOR CHARTS

NOAA FORM 76-40
(8-74)

Replaces C&GS Form 567.

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

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

ORIGINATING ACTIVITY
- [XX] HYDROGRAPHIC PARTY
- [ ] GEODETIC PARTY
- [ ] PHOTO FIELD PARTY
- [ ] COMPILATION ACTIVITY
- [ ] FINAL REVIEWER
- [ ] QUALITY CONTROL & REVIEW GRP.
- [ ] COAST PILOT BRANCH

(See reverse for responsible personnel)

[ ] TO BE CHARTED
[ ] TO BE REVISED
[X] TO BE DELETED

REPORTING UNIT (Field Party, Ship or Office)	STATE	LOCALITY	DATE
NOAA Ship PEIRCE	MARYLAND	CHESAPEAKE BAY	JUNE 1984

The following objects HAVE [X] HAVE NOT [ ] been inspected from seaward to determine their value as landmarks.

OPR PROJECT NO.	JOB NUMBER	SURVEY NUMBER	DATUM
S-E404-PE-84		D-22	NA 1927

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	POSITION LATITUDE ° ′	POSITION LATITUDE ″ D.M. Meters	POSITION LONGITUDE ° ′	POSITION LONGITUDE ″ D.P. Meters	METHOD AND DATE OF LOCATION (See instructions on reverse side) OFFICE	METHOD AND DATE OF LOCATION FIELD	CHARTS AFFECTED
TANK	TANK HAS BEEN DISMANTLED	38 02'	59.078"N	76 19'	22.713"W			12230 12233 12285
CONFEDERATE MONUMENT	CANNOT BE SEEN FROM SEAWARD OBSCURED BY TALL TREES	38 04'	23.97"N	76 20'	33.07"W			12230 12233 12285
	Sec L-1105(84)							

RESPONSIBLE PERSONNEL

TYPE OF ACTION	NAME	ORIGINATOR
OBJECTS INSPECTED FROM SEAWARD	Walter S. Simmons NOAA Ship PEIRCE	☐ PHOTO FIELD PARTY ☒ HYDROGRAPHIC PARTY ☐ GEODETIC PARTY ☐ OTHER *(Specify)*
POSITIONS DETERMINED AND/OR VERIFIED		FIELD ACTIVITY REPRESENTATIVE
		OFFICE ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES		☐ REVIEWER ☐ QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'

(Consult Photogrammetric Instructions No. 64.

OFFICE

I. OFFICE IDENTIFIED AND LOCATED OBJECTS

Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object.

EXAMPLE: 75E(C)6042
8-12-75

FIELD

I. NEW POSITION DETERMINED OR VERIFIED

Enter the applicable data by symbols as follows:

F - Field	P - Photogrammetric
L - Located	Vis - Visually
V - Verified	
1 - Triangulation	5 - Field identified
2 - Traverse	6 - Theodolite
3 - Intersection	7 - Planetable
4 - Resection	8 - Sextant

A. Field positions* require entry of method of location and date of field work.

EXAMPLE: F-2-6-L
8-12-75

*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.

FIELD (Cont'd)

B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object.

EXAMPLE: P-8-V
8-12-75
74L(C)2982

II. TRIANGULATION STATION RECOVERED

When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery.

EXAMPLE: Triang. Rec.
8-12-75

III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH

Enter 'V-Vis.' and date.

EXAMPLE: V-Vis.
8-12-75

**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.

☆ U.S.GPO:1975-0-665-080/1155

APPENDIX J

APPROVAL SHEET

APPROVAL SHEET

D-22

Field work on this survey was conducted under my supervision with frequent personal examination of the field sheet and records. This report and the final field sheet have been reviewed and found to represent a complete and adequate chart evaluation survey. - See section I.c. of the Evaluation Report.

Walter S. Simmons

Commander, NOAA

Commanding Officer

NOAA Ship PEIRCE

6+7 compl.

RETURN TO NAUTICAL DATA BRANCH FILES

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
NOAA SHIPS RUDE & HECK
439 West York Street
Norfolk, Va. 23510

1382 (1980)

SEP 19 1978

DATE: 10 September 1978

REC'D SEP 19 1978
MARINE SURVEYS DIVISION
OFFICE OF MARINE SURVEYS

TO: Director, Atlantic Marine Center
ATTN: CAM 1

FROM: LCDR Robert V. Smart
Commanding Officer

Robert V. Smart, LT-CDR, NOAA

SUBJ: Monthly Activities Report - NOAA SHIPS RUDE & HECK - 26 July thru 25 August 1978

A. GENERAL

During this reporting period, the NOAA Ships RUDE and HECK completed Item 6, 7, and 8 of OPR-E609-RU/HE-78, Chesapeake Bay and commenced work on OPR-C622-RU/HE-78, New York Bight. Items 7 and 8 are Supplemental Changes 2 and 3, respectively, to the original project instructions. Wire drag operations on the New York Bight Project, Supplemental Change No. 1, were conducted while enroute from Chesapeake Bay to Brooklyn, New York.

(see attached - NM 13 Mar. 29, 1952)

Item 6 is the 150 foot barge ECKIE, position approximate at latitude 38°-36.3'N and longitude 76°-25.7'W. It reportedly sank in 70 feet in 1952 of water. The barge was hung on 3 August in the southeastern section of the 1 nautical mile investigation circle. Prior to its discovery, approximately 95 percent of the circle had been surveyed and two uncharted wrecks found. The latter two wrecks have already been reported last period and will not be covered in this report. The ECKIE was hung at 44 1/2 feet effective in 38°-35.77'N and 76°-24.72'W. A least depth of 42.8 feet was obtained by lead line soundings on 9 August 1978.

Item 7 is given as a submerged dangerous wreck in latitude 38°-25.46'N and longitude 76°-23.40'W. The wreck is described as a barge in 47 feet of water with a least depth of about 37 feet. Although a USCG navigation buoy has been established ENE of the wreck, precise information was requested from the Coast Guard due to its proximity to the LNG docking facility at Cove Point, Maryland. On 8 August, fathometer traces over the barge were obtained and a surface marker deployed. Divers attempted to survey the barge, but due to very restricted visability, they were unable to locate it. The wreck was hung at 34 1/2 feet on 10 August and clearing strips of 33 1/2 feet and 33 feet, effective obtained on 14 August. These strips were run from opposite directions since the nature of the wreck was unknown.

C-3221 KOS 11/13/80

FE-267

Item 8 consisted of three obstructions, submerged pilings in nature and located within the bombing range offshore of the Patuxent River Naval

Area - 2

CHART 12263 Applied
12260 WBW 11/7/80
12266
Ref L-1387(78) Ref L-411(8)
BP-105227

(See Attachments)

*Item #6 Subm wreck Sym Charted 38°36'78"-76°25'42" was deleted from chart [illegible] after reviewing the attached information WBW 11/6/80

** For Item #8

OCT 31 1980

Air Test Center, Maryland, Chart 12230. Visual control was used since the purpose of this investigation was to locate and buoy the obstructions for the Navy. Obstruction A was given as latitude 38°-14.13'N and 76°-20.50'W, located within Restricted Area 204.42. It was hung on 11 and 15 August. A NOAA/Navy diving team investigated the hang, verified it was the obstruction and secured a surface marker. Obstruction B, in latitude 38°-13.97'N and longitude 76°-18.88'W, located within Prohibited Area 204.42, was the center bombing target. It was hung on 16 August and a surface marker dropped at the hang position. Obstruction C, in latitude 38°-12.98'N and longitude 76°-18.97'W, also within Prohibited Area 204.42, was known as Old Hooper, another bombing target. It was located on 16 August and a surface marker also dropped at the point of hang. Launches were used for wire dragging and diver investigations were not conducted due to the extent and nature of debris within this target area. These pilings were part of the fourth generation of targets constructed. Previous targets were destroyed either by bombing or surface ice. The subsurface water column is literally a pile of lumber, steel and concrete, hazardous to both ship and diver.

Supplemental Change No. 1 of OPR-C622-RU/HE-78 required a wire drag search for three lost current meter arrays for the MESA/New York Bight Project Office. LPG-3, located at 40°-28.5'N and 73°-40.1'W, would be dragged for while operating out of Floyd Bennett Field. NJ-1 and NJ-2 are east of Atlantic City, New Jersey in positions 39°-18.3'N and 74°-01.0'W, and 39°-10.2'N and 73°-56.5'W, respectively. The ships set 2 drags, 50 feet deep for NJ-1 and 48 feet for NJ-2 on 23 August. Using Loran-C for control, the effective width of each drag was approximately 0.5 nautical miles and centered on each of the given positions. No hangs were encountered, however, due to the nature of the array, construction of the subsurface float and a running swell of 3 to 4 feet at the time, there is a good possibility that the bottom wire slipped up and over the flotation sphere.

The ships operated out of Annapolis, Maryland while investigating Item 6. They relocated to the Naval Surface Weapons Center, Solomons Island, Maryland on 7 August while working on Items 7 and 8. The Raydist stations were dismantled on 17 August and the ships transited to Little Creek, Virginia on 18 August. Departing on 21 August, the RUDE and HECK arrived in Atlantic City, New Jersey on 22 August for repairs to the Loran-C receiver on board the HECK. Transit to and arrival at Floyd Bennett Field Brooklyn, New York was on 24 August. The HECK remained inport on 25 August in order to facilitate repairs to the Dodge clutch on the port main engine.

There were 23 scheduled work days this reporting period. Successful wire drag operations were conducted on 8 letter days (BJ thru BR), resulting in 14 acceptable drags. In addition, 3 days and 4 drags were required for Item 8. The ships were underway in transit on 4 days. Raydist tower relocation accounted for 2 days, while 2 more days were dedicated to general survey investigation. The current meter search, repairs to Loran

C, engine repairs, and administrative work each accounted for 1 day (4 days total).

This command expects to be working on OPR-C622-RU/HE-78 until mid November. During this period, the Floyd Bennett Field facilities will be used for inporting on weekends.

B. FIELD OPERATIONS

Items 6, 7 and 8 are in reference to project instructions OPR-E609-RU/HE-78, dated 8 December 1977.

* Item 6 is given as a submerged dangerous wreck, position approximate in latitude 38°-36.30'N and longitude 76°-25.70'W. It is identified as the 150 foot barge ECKIE, sunk in 70 feet of water. Investigation of this item began 8 June and was completed on 9 August. Approximately 95 percent of the one mile radius investigation circle was surveyed and two uncharted wrecks discovered before the ECKIE was located on 3 August. A complete report on these two wrecks was submitted last period.

(1) The barge ECKIE was hung and located in latitude 38°-35.77'N and longitude 76°-24.72'W.

(2) A least depth of 42.8 feet (corrected) was obtained by lead line sounding, assisted by divers. 42½: Wk Apply without bracket per new recommendation (see note) JOC 4/12/80

(3) A clearing strip was not run on this item as it was investigated by divers, determined to be complete and a lead line sounding taken at the highest point.

(4) A least depth of 41 and 42 feet was obtained by divers in 50 feet of water using the standard depth gauge.

Least depth

Disregard SDB (5) It is recommended that the symbol indicating a wreck ~~cleared~~ by wire drag (Chart No. 1, Section 0.15a) be charted in latitude 38°-35.77'N and longitude 76°-24.72'W on Charts 12263 and 12266. Based on predicted tides, a depth of 42.8 feet should be ascribed to this symbol.

Item 7 is described as a submerged dangerous wreck, charted in latitude 38°-25.46'N and longitude 76°-23.40'W. It is listed as a barge in 47 feet of water with a least depth of 37 feet over it. This item is Supplemental Change No. 2 to the project instructions and its purpose was to determine the exact position and nature of the wreck due to its proximity to the El Paso LNG terminal docks.

No Corr WBW 1-30-81 (see LNM 50/79)

(1) Work on this item began 8 August and was completed on 14 August.

(2) The item was located in latitude 38°-25.43'N and longitude 76°-23.49'W.

38°25'25.8"
76°23'29.4"

1-13-81

C, engine repairs, and administrative work each accounted for 1 day (4 days total).

This command expects to be working on OPR-C622-RU/HE-78 until mid November. During this period, the Floyd Bennett Field facilities will be used for inporting on weekends.

B. FIELD OPERATIONS

Items 6, 7 and 8 are in reference to project instructions OPR-E609-RU/HE-78, dated 8 December 1977.

* Item 6 is given as a submerged dangerous wreck, position approximate in latitude 38°-36.30'N and longitude 76°-25.70'W. It is identified as the 150 foot barge ECKIE, sunk in 70 feet of water. Investigation of this item began 8 June and was completed on 9 August. Approximately 95 percent of the one mile radius investigation circle was surveyed and two uncharted wrecks discovered before the ECKIE was located on 3 August. A complete report on these two wrecks was submitted last period.

(1) The barge ECKIE was hung and located in latitude 38°-35.77'N and longitude 76°-24.72'W.

(2) A least depth of 42.8 feet (corrected) was obtained by lead line sounding, assisted by divers. 42½: WK Apply without bracket per new recommendation (see note) DMC 11/12/80

(3) A clearing strip was not run on this item as it was investigated by divers, determined to be complete and a lead line sounding taken at the highest point.

(4) A least depth of 41 and 42 feet was obtained by divers in 50 feet of water using the standard depth gauge.

Least depth

Disregard SAS (5) It is recommended that the symbol indicating a wreck ~~cleared~~ by wire drag (Chart No. 1, Section 0.15a) be charted in latitude 38°-35.77'N and longitude 76°-24.72'W on Charts 12263 and 12266. Based on predicted tides, a depth of 42.8 feet should be ascribed to this symbol.

Item 7 is described as a submerged dangerous wreck, charted in latitude 38°-25.46'N and longitude 76°-23.40'W. It is listed as a barge in 47 feet of water with a least d[illegible] of 37 feet over it. This item is Supplemental

No Corr WBW 1-30-81 (SEE LNM 50/79)

Change No. 2 to the pro[illegible] item 6 *

the exact position and [illegible] (5)

Paso LNG terminal docks [illegible] disregard this recommendation of using a cleared depth symbolization as a least depth of 42.8' was obtained. Add 42½ WK.

Steve Baumgardner 11/12/80

(1) Work on this it

(2) The item was lo
76°-23.49'W.

38°25'25.8"
76°23'29.4"

L-[illegible]/80

(3) The greatest cleared depth, corrected for predicted tides is 33.5 and 33 feet (opposite directions). The wreck was hung at 34.5 feet.

(4) There was no least depth obtained by divers due to restricted visability.

(5) It is recommended that the symbol for a wreck cleared by wire drag (Chart No. 1, Section 0.15a), with a depth of 33 feet be charted in latitude 38°-25.43'N and longitude 76°-23.49'W. The location of this wreck is approximately 400 feet on a true bearing of 250 degrees from buoy WR63. When charting the recommended symbol, the old PA wreck symbol should be removed.

** Item 8 as per Supplemental Change No. 3 was not a survey investigation. The ships were assigned to locate the subsurface remains of bombing targets. Survey data was not gathered on this item. Work on this item began 11 August and was completed on 16 August. No action is required as the structures were located and buoyed for Navy disposition.

Supplemental Change No. 1 to project instructions OPR-C622-RU/HE-78, New York Bight, required these vessels to locate two current meter arrays off the New Jersey Coast. On 23 August the ships dragged both locations, NJ-1 and NJ-2 with negative results. No data was gathered as these were search and not survey drags.

C. DEPARTMENT ACTIVITIES

1. ENGINEERING
   a. Continued routine maintenance throughout month.

2. DECK
   a. Wire drag operations.
   b. Assisted in moving ships from Annapolis, Maryland to New York.
   c. Assisted in moving Raydist stations from Annapolis Maryland area to New York area.
   d. Routine maintenance.

3. ELECTRONICS
   a. Routine maintenance.
   b. Moved Green Raydist from Deale, Maryland to Calvert Cliffs. No 110 VAC available.
   c. Changed batteries daily at Calvert Cliffs.
   d. Removed true time TF-4 WWV receiver from HECK. Open speaker.
   e. Took down Red and Green Raydist stations.
   f. Put up raydist stations at Sea Girt and Sandy Hook, N.J.
   g. Installed TF-4 receiver on HECK. Replaced speaker at AMC.
   h. Loran C down on HECK. Repaired at Atlantic City, N.J.. Approximately 5 hours downtime for repairs.

WRECK REPORT

Additional Information for Item #6 From Project OPR-E609-RU/HE-78 WIRE DRAG East Coast Investigation, Chesapeake Bay

date: April 1952

(13)

NAME: Eckie

RIG: Barge

OFFICIAL NUMBER: 220141

DATE & LOCATION BUILT: 1920

Item #6

DATE SUNK: March 11, 1952 3:35 a.m.

REPORTED POSITION WHERE SUNK: 3 miles North of Sharp's Island Gas bouy 18A in Chesapeake Bay, West of main shipping lane.

EXACT POSITION:

OWNER: S. C. Loveland Co., Inc., 151 South Front St., Philadelphia, Pa.

MASTER AT TIME OF SINKING: none (in tow of tug Gertrude Loveland) Captain of tug: Ben Royal Piner

CARGO AT TIME OF SINKING: Nitrate of Soda (500 tons)

HOME PORT: Philadelphia, Pa.

LAST PORT SAILED FROM: Norfolk, Va.

PORT BOUND FOR:

WEATHER CONDITIONS AT TIME OF SINKING: wind Southeast 40 knots, seas rough, heavy rain

PHOTOGRAPH &/OR DRAWING: none

CONSTRUCTION: steel

CONDITION OF WRECK AT PRESENT (VERIFIED BY DIVING SURVEY):

REFERENCES & SUPPORTING DATA: Sandy Point C. G. Station radiod; U.S.C.G. casualty report and findings of Board of Inquiry.

1/12

(13)

Item #6 Applied to chart from this source

(1485) **CHESAPEAKE BAY—Sharps Island—Wreck.**—The wreck of a loaded barge, 150 feet long, is reported sunk in 70 feet of water, about 3 miles north of Sharps Island Lighted Buoy 18A (38°33'18" N., 76°25'41" W.) and may be considered a menace to navigation.

(Comdr. 5 C. G. Dist., 120735, Mar. 1952.)
U. S. Coast Survey Charts 553, 551, 1225, 77.
U. S. Coast Pilot, Section C, 1947, page 317.

(N. M. 13, Mar. 29, 1952.)

Three miles North of Sharps Lt. is 38°36'18"N 76°25'41"W

Lt. Position.

(1486) **ATLANTIC INTRACOASTAL WATERWAY—Norfolk, Virginia, to Key West, Florida, and Okeechobee Waterway—Channel depths reported by the ps of Engineers.**

Section limits	Nautical miles	Coast survey charts	Date	Depth (feet)
Route 2—Norfolk to Albemarle Sound via Dismal Swamp Canal.	59. 1	829	Dec. 1951	*8. 0
Route 1—Norfolk to Virginia-North Carolina State line.	29. 5	830	do	11. 6
Virginia-North Carolina State ıe to Albemarle Sound.	58. 4	830–831	Feb. 1952	†12. 0
emarle Sound to Pamlico River.	127. 4	831–832	do	†10. 9
Pamlico River to Morehead City	177. 0	832–833	do	†10. 9
Morehead City to Cape Fear River.	259. 6	833–834	do	†[1] 9. 3
Cape Fear River to Little River	296. 7	835	do	†[2] 10. 5
Little River to Winyah Bay	350. 8	835–836	do	10. 0
Winyah Bay to Charleston	406. 0	836–837	do	†[3] 9. 6
Charleston to North Edisto River.	431. 4	837	do	†10. 0
North Edisto River to Beaufort, C.	465. 5	838	do	†8. 0
B ort, S. C., to Savannah River.	499. 4	838–839	do	†10. 0
Savannah River to Sapelo Sound	548. 9	839–840	do	†9. 0
Sapelo Sound to St. Simon Sound	588. 4	840	do	†10. 0
St. Simond Sound to Fernandina	622. 0	840–841	do	[4] 12. 0
Fernandina to St. Johns River	642. 2	841–842	July 1951	[4] 2. 6
St Johns River to St. Augustine	675. 8	842	Jan. 1952	[4] 6. 6
St. Augustine to Haulover Canal	755. 0	842–844	Nov. 1951–Jan. 1952.	4. 4
Haulover Canal to Fort Pierce	839. 3	844–845	Dec. 1950	8. 0
Fort Pierce to Lake Worth Inlet	884. 6	845–846	May 1951	†7. 4
Lake Worth Inlet to Port Everglades.	926. 5	846–847	Dec. 1950	(5)
Port Everglades to Miami	946. 1	847–848	do	(5)
Miami to Cross Bank	1, 001. 0	848–849–3261	Jan. 1948	7. 0
Cross Bank to Key West	1, 093. 0	3261	do	5. 0
Okeechobee Waterway	128. 5	1289	Dec. 1951	[4] 8. 0

Mile 0.0—Foot of West Main Street, Norfolk, Va.

L-1382-/85

C.O. [illegible]
X.O. [illegible]
I.O. [illegible]

S. C. LOVELAND CO., INC.
MARINE TRANSPORTATION
320 WALNUT STREET
PHILADELPHIA, PA. 19106

July 7, 1978

From Project OPR-E609-RU/HE-78
Wire Drag

Commanding Officer NOAA
Ships RUDI and HECK
439 West York Street
Norfolk, Virginia 23510

ATTENTION: Samuel DeBow, Lieutenant (j.g.)

Dear Sir:

Relative to your telephone inquiry of June 30, asking for information regarding the barge ECKIE we have ascertained that the registered dimensions of this barge are length: 149', beam: 20.2' and depth: 10.9'. It was built as a steam barge, the PUTNAM, at Staten Island, New York in 1920 and purchased and converted to a barge by us about 1938. It was originally a rivited steel hull but the conversion work was all welded. The barge had one cargo hold with water-tight steel bulkheads at the bow and stern compartments. It was single skinned and had a wooden ceiling (floor) in the cargo hold. My recollection is that it had three (3) hatches about 14 1/2" wide but it could have used only two (2) hatches with a dead hatch in between. It had a small cabin for one man at the stern. It had two (2) heavy longitudinal guards running the entire length of the barge, one just below the deck and the other about 2 1/2' below it, I think made out of extra heavy half-round pipe. Both the bow and stern were tapered inward slightly (semi-cigar shaped) and there were two (2) skegs fitted under the stern rake. The bilge plate was at a forty-five degree angle to provide a sort of self-trimming effect in the cargo hold and which resulted in the barge's flat bottom being only about 15' wide.

We hope this will enable you to positively identify the wreck you have found.

Yours very truly,

S. C. LOVELAND CO., INC.

S. C. Loveland

S. C. Loveland, Jr.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
ATLANTIC MARINE CENTER

Co. RVS
X.O. [illegible]
Sam SPO.
Lloyd L
Please make a copy for me, X.O. and give original to Sam.

July 26, 1978 ** For Item #8

FE-267 CAM102/JDS

Commanding Officer
NOAA Ships RUDE and HECK

PROJECT INSTRUCTIONS: OPR-E609-RU/HE-78, Wire Drag, East Coast Investigations, Chesapeake Bay

CHANGE NO. 3: Supplement to Instructions

1. The Naval Air Test Center, Patuxent River, Maryland has requested assistance to locate submerged pilings in the bombing range in the Prohibited Area 204.42 and Restricted Area 204.42 on NOS Chart 12230. A section of NOS Chart 12230 indicating the area is attached.

2. This area has several targets that are used for bombing practice. Some of the targets have been destroyed above the surface; however, the pilings below the surface are still in place.

3. A wire drag investigation of the following areas shall be conducted to locate submerged pilings.

38-14-08N 76-20-18W	38-13-04N 76-18-51W	38-12-59N 76-18-58W

This investigation will be Item No. 8.

4. Control shall be by the best available method. The Navy uses a theodolite tracking device for control during their bombing practice. This control may be available for positioning the submerged structures that are located. A Navy vessel will be in the area during wire drag operations. Any obstructions that are located shall be marked with a buoy and the Navy vessel notified.

5. Two days of project time is approved for completion of work on this item. All work shall be coordinated with Lt. Bob Brado, Naval Air Test Center, Patuxent (phone 301-863-3301).

6. All other provisions of the basic instructions remain unchanged.

Chts. 12230
12233

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF CHARTING AND GEODETIC SERVICES
ROCKVILLE, MARYLAND 20852

N/CG241:AAA

JAN 14 1985

TO: N/MOA23 - David B. MacFarland, Jr.

FROM: N/CG24 - Roy K. Matsushige Dale E. Watkins for

SUBJECT: Verification of AWOIS Items from S-E404-PE-84

Please completely verify the field work submitted for AWOIS items 3426, 3427, 3428, and 3433 under project S-E404-PE-84, Chesapeake Bay Hurricane Anchorages, Virginia. Verify the positions determined by the hydrographer on AWOIS items 3424 and 3425 to ensure that the obstructions located were the assigned items.

Request an FE registry number, or numbers, as necessary in accordance with the Hydrographic Manual.

Registry Number : FE-267 obtained.

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NO.: FE-267

Number of positions	692
Number of soundings	4382
Number of control stations	10

	TIME-HOURS	DATE COMPLETED
Preprocessing Examination	19	1 DEC 84
Verification of Field Data	149	11 JUN 85
Quality Control Checks	34	
Evaluation and Analysis	122	18 APR 86
Final Inspection		5 JUN 86
TOTAL TIME	319	
Marine Center Approval		12 JUN 86

Transmittal letter of survey and survey records will be included in the Descriptive Report to identify the records accompanying the survey.

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

Date: 03/01/85

Marine Center: Atlantic

OPR: E 404

Hydrographic Sheet: FE-267 (PE-20-2-84)

Locality: Chesapeake Bay

Time Period: June 13-22, 1984

Tide Station Used: 863-5750 Lewisetta, VA

Plane of Reference (Mean Low Water): 4.65 ft.

Height of Mean High Water Above Plane of Reference: 1.3 ft.

Remarks: Recommended Zoning:

1) For Awois Items #3424 and 3425, apply a + 10 minute time correction and x 0.92 range ratio to all heights.
2) For Awois Items # 3426 and 3427, apply a + 15 minute time correction and x 0.92 range ratio to all heights.
3) For Awois Items # 3428 and 3433, apply a + 25 minute time correction and x 0.85 range ratio to all heights.

James R. Hubbard
Chief, Tidal Datums Section

ATLANTIC MARINE CENTER
EVALUATION REPORT

SURVEY NO.: FE-267 FIELD NO.: PE-20-4-84

Maryland, Chesapeake Bay, Point Lookout to Cedar Point

SURVEYED: 12 through 21 June 1984

SCALE: 1:20,000 PROJECT NO.: S-E404-PE-84

SOUNDINGS: RAYTHEON DSF-6000N Fathometer CONTROL: MOTOROLA Falcon 484 Mini-Ranger (Range/Range)

Chief of Party.....W. S. Simmons

Surveyed by.....V. D. Ross
.....M. A. Conricote
.....J. H. Maddox
.....V. A. Barnum
Automated Plot by.....XYNETICS 1201 Plotter (AMC)

1. INTRODUCTION

a. No unusual problems were encountered during office processing.

b. Notes in the Descriptive Report were made in red during office processing.

c. This survey was originally conducted as a Chart Evaluation Survey (CES) and was registered under survey number D-22 (1984). During the critique of data acquired by the field unit, it was decided that several Automated Wreck and Obstruction Information System (AWOIS) items of the survey would be combined and those survey items made into a field examination. This field examination consists of six (6) item investigations that were part of the original survey. A copy of the letter requesting processing of the AWOIS items is appended to the Descriptive Report. The verification and evaluation of the data only addresses the survey data relative to the AWOIS items.

2. CONTROL AND SHORELINE

a. Control is adequately discussed in sections F., G., and S. of the Descriptive Report.

b. There is no shoreline within the areas surveyed.

3. HYDROGRAPHY

a. Soundings at crossings are in excellent agreement and comply with the criteria found in sections 4.6.1 and 6.3.4.3. of the HYDROGRAPHIC MANUAL.

b. The standard depth curves could not be drawn in their entirety. Standard depth curves were drawn where soundings provide sufficient information for delineation of the curves.

c. The development of the bottom configuration and determination of least depths is considered adequate with the following exception:

Additional lines of development would have been desirable on an the eighteen (18) foot sounding found to the east of the investigation for AWOIS Item 3426, a charted 18-ft sounding in Latitude 38°07'43.8"N, Longitude 76°17'26.1"W. These additional lines could have established the existence of a shoal or the presence of a single eighteen (18) foot shoal sounding.

4. CONDITION OF SURVEY

The smooth sheets and accompanying overlays, hydrographic records and reports are adequate and conform to the requirements of the HYDROGRAPHIC MANUAL. with the following exceptions:

a. Twice daily bar checks were not taken during the development of the six (6) items investigated by the hydrographer. Hydrography and side scan sonar operations were conducted on eight (8) days using two (2) launches. Launch 3281 obtained three (3) out of a possible fourteen (14) bar checks and launch 3282 obtained one (1) out of a possible two (2) bar checks. The requirement for twice daily bar checks is found in sections 1.5.2 and 4.9.5.1.1. of the HYDROGRAPHIC MANUAL. The bar check data for the hydrography run on these AWOIS items is necessary to provide the most accurate data for charting.

b. No confidence checks were taken by the hydrographer prior to or upon completion of daily side scan sonar operations. The Provisional Side Scan Sonar Manual, dated 6 April 1983 provides guidance for confidence checks and also states, "At least two checks shall be made daily."

c. The hydrographer's discussion of AWOIS Item # 3428 on page 6, section K. of the Descriptive Report did not include the position number or a position of the object found on the sonargram. This requirement is found in section 5.3.4.(K and L) of the HYDROGRAPHIC MANUAL. The

inclusion of this information aids the verifier and/or evaluator with the completion of the survey.

d. The hydrographer failed to adequately investigate AWOIS Item # 3428, a charted submerged obstruction, in Latitude 38°14'07.8"N, Longitude 76°20'18.0"W. The required area of search was a 500 meter (minimum) radius circle using side scan sonar or bottom sweep. The hydrographer claimed "a 200% coverage over a 100 meter radius circle centered on the reported position...." The constant tension wire drag search for the obstruction was performed fifty (50) meters north and south of the obstruction with a "split" directly over the obstruction. It is incumbent on the hydrographer to fully investigate the items required by the Project Instructions in such a manner that the data gathered provides a complete and comprehensive picture of the entire area to be investigated. Failure to complete the required investigation leaves additional work to be done in the future. If the required methods of search found in the Project Instructions are not reasonable the hydrographer should note this in the Descriptive Report. Additional discussion of AWIOS Item # 3428 is in section 7.a.3) of this report.

e. After a thorough examination of the development of AWOIS Item # 3426, it was determined that the single line of hydrography over the "obstruction" was not adequate to determine the extent or nature of the obstruction. Side scan sonar equipment was on board the launch and had just been retrieved prior to the investigation for item # 3426. The hydrographer should have deployed the side scan sonar unit after the discovery of the "obstruction" and conducted a full investigation of the "obstruction."

f. The hydrographer should be commended for the comparison with prior surveys with the present survey. This phase of work was not required by the Project Instructions; however, the hydrographer took the time to compare the present survey data with the prior survey data. Additionally the hydrographer had to establish which prior surveys were applicable to the areas surveyed.

5. JUNCTIONS

There are no junctional requirements for the items investigated.

6. COMPARISON WITH PRIOR SURVEYS

a. Hydrographic

H-7092 (1946)	1:10,000
H-7094 (1945-46)	1:20,000

H-8279 (1955-59) 1:10,000
H-8283 (1956) 1:20,000

The four (4) prior surveys listed above cover the area of the items investigated by the present survey.

The soundings on prior survey H-8283 (1956) common to the area where sounding information was obtained in the investigation of AWOIS Items # 3424 and # 3425 are one (1) to two (2) feet shoaler than present survey depths. See also section 6.b. of this report.

The soundings on prior survey H-8279 (1955-59) common to the area where sounding information was obtained during the investigation of AWOIS Item # 3426 are one (1) to two (2) feet shoaler than present survey depths. See also section 7.a.1) of this report.

The soundings on prior survey H-7094 (1945-46) common to the area where sounding information was obtained during the search for AWOIS Item # 3427 are one (1) foot shoaler than present survey depths. See also section 7.a.2) of this report.

The soundings on prior survey H-7094 (1945-46) common to the area where sounding information was obtained during the search for AWOIS Item # 3428 are one (1) to two (2) feet shoaler than present survey depths. See also section 7.a.3) of this report.

The soundings on prior survey H-7092 (1946) common to the area where sounding information was obtained during the search for AWOIS Item # 3433 are one (1) to two (2) feet shoaler than present survey depths.

The sounding information portrayed on the page size smooth plots of the AWOIS items may be used to supplement charted hydrography if it is deemed appropriate. Considering the deepening trend seen in the areas discussed above it is suggested that consideration be given to new basic surveys of the area.

b. Wire Drag

FE-102WD 1950 1:40,000

FE-102WD (1950) was a wire drag investigation which found three (3) submerged obstructions. The obstructions were found during the investigation and subsequently applied to the chart. An obstruction in Latitude 38°05'21"N, Longitude 76°15'08"W was hung at forty (40) feet and cleared by thirty-eight (37) feet. A second obstruction in Latitude 38°05'23"N, Longitude 76°15'06"W was hung at thirty-nine (39) feet and cleared by thirty-seven (37) feet. These two

(2) obstructions were plotted as a single obstruction on the chart. The second obstruction found by FE-102WD (1950) was located in Latitude 38°05'09"N, Longitude 76°14'34"W. This obstruction was located with a fathometer on the prior survey and subsequently cleared by wire drag at a depth of thirty-nine (39) feet. This obstruction was subsequently applied to the chart. These two (2) charted obstructions are AWOIS Items # 3425 and # 3424, respectively.

The three (3) obstructions were found by the present survey using side scan sonar. Echo sounder least depths were obtained on each item.

AWOIS Item # 3424 was searched for and located by the field unit in Latitude 38°05'08.60"N, Longitude 76°14'33.14"W. An echo sounder least depth of forty-one (41) feet was obtained. The present survey least depth is one (1) foot deeper than the prior survey minimum hang depth. This may be attributed to some settlement in the sea bottom, settlement of the wreckage, or deterioration of the wreckage and a general deepening trend in the area. Differences between the present and prior surveys are attributable to survey methods with the present survey position considered more accurate. Prior survey H-8283 (1956) depths are generally one (1) to two (2) feet shoaler than present survey depths in the common area. See section 6.a. of the Evaluation Report for FE-275SS (1985) for a charting recommendation.

The two (2)obstructions that comprise AWOIS Item # 3425 were searched for and located by the present survey. The first obstruction found by the field unit is located in Latitude 38°05'19.92"N, Longitude 76°15'01.72"W with an echo sounder least depth of forty (40) feet, and the second obstruction is located in Latitude 38°05'24.00"N, Longitude 76°15'03.76"W with an echo sounder least depth of forty-three (43) feet. The present survey echo sounder depths are two (2) and four (4) feet, respectively, deeper than prior survey depths on the obstructions. Present survey general depths in the area are one (1) to two (2) feet deeper than prior survey depths of survey H-8283 (1956). This may be attributed to settlement of the obstructions into the bottom or deterioration and a general deepening trend in the area. Differences between the present and prior survey positions are attributable to survey methods with the present survey considered to be more accurate. See section 6.a. of the Evaluation Report for FE-275SS (1985) for a charting recommendation.

There are no conflicts between present survey depths and the effective depths on the prior survey.

c. Side Scan Sonar

FE-275SS (1985) 1:20,000

The above subsequent survey was conducted by the NOAA Ships RUDE/HECK. Two AWOIS items investigated by the RUDE/HECK are common to the present survey. They are AWOIS Items # 3424 and # 3425. Both of the items were located on the subsequent survey and dives were made on each item. The items were identified by the field unit and positive charting recommendations were made in section 6.a of the Evaluation Report for FE-275SS (1985).

7. COMPARISON WITH CHART 12231 (20th Edition, May 22/83)
12233 (27th Edition, May 28/83)

a. Hydrography

The charted hydrography originates with the previously discussed prior surveys. The following should be noted:

1) The charted 18-ft sounding, in Latitude 38°07'43.8"N, Longitude 76°17'26.1"W, was searched for by the hydrographer and an eighteen (18) foot sounding was found on the present survey in Latitude 38°07'44.17N, Longitude 76°17'24.43"W. An examination of the echogram for day 166 indicates an obstruction. The hydrographer annotated the echogram with "obstruction" and a second smaller indication of an obstruction was found in Latitude 38°07'45.02"N, Longitude 76°17'24.46"W. The second obstruction has an echosounder least depth of twenty-one (21) feet. The charted sounding is approximately forty-seven (47) meters ~~north~~ southeast ~~northeast~~ of the eighteen (18) foot obstruction found on the present survey. It is recommended that the charted 18-ft sounding be deleted and the two (2) obstructions found on the present survey be charted, if possible, at the scale of the chart. It is also recommended that this item be fully investigated at some convenient time to ascertain its full extent and nature. - GLM 5/4/89

2) AWOIS Item 3427, a charted dangerous sunken wreck, PA, in Latitude 38°09'36"N, Longitude 76°18'00"W was searched for by the hydrographer with negative result using side scan sonar. The hydrographer claimed 400% coverage of the search area. From all information available it does not appear that the right channel of the side scan sonar unit was reaching its maximum range. It should also be noted that the hull of the sunken wreck may not have had a reflection coefficient that would have given a perceptible return on the sonargram. It is also possible that the wreck is acoustically invisible. Because the required side scan sonar coverage was not achieved, it is recommended that the dangerous sunken wreck, PA be retained as charted.

3) AWOIS Item 3428, a charted submerged obstruction, in Latitude 38°14'07.8"N, Longitude

76°20'18.0"W was searched for by the hydrographer with side scan sonar and constant tension wire drag. The hydrographer noted a small contact with almost no shadow on the sonargram for day 170. An approximate position of Latitude 38°14'09"N, Longitude 76°20'19"W for the contact was computed during office processing. This position is approximately forty-four (44) meters northwest of the charted position. A constant tension wire drag investigation was deemed ineffective because there was a "split" directly over the charted position of the obstruction. The copy of the report submitted by the Explosives Ordinance Disposal (EOD) team from Fort Story, Virginia provides conclusive evidence that seven (7) "underwater hazards to navigation (Target Pilings)" were cut off "at or below six (6) feet from the bottom".

The items searched for by the NOAA Ships RUDE/HECK in August 1978 were a pile in the charted Restricted Area and six piles in the Prohibited Area known as the "Hooper Target". The charted position listed above originates with the 1978 RUDE/HECK work and was applied to the chart via Chart Letter 1382 of 1980 (CL 1382/80). The data used to determine the position of the obstruction found by the RUDE/HECK was not recorded by the ships at the time of acquisition and was not found during a thorough search of the original records for the unprocessed survey FE-222WD (1978). The method used to locate the obstruction was three point sextant fixes, and the ships' launches were used to perform the work. The submerged obstruction found by the RUDE/HECK in the above position is approximately 290 meters southeast of a former Navy target. This target was known as the "Bat Target". A list of geodetic positions provided to the NOAA Ship PEIRCE by personnel at the navy facility at Patuxent River, Maryland gave the location of the "BAT TARGET" as Latitude 38°14'15.57408"N, Longitude 76°20'24.68551"W. Considering the positional differences between the obstruction located by the RUDE/HECK and the geodetic position of the "BAT TARGET", it is believed that the obstruction located by the RUDE/HECK may not have been the "Bat Target".

Considering all of the available information it is recommended that the submerged obstruction be retained as charted. It is also recommended that this item be retained in the AWOIS files, and that consideration be given to putting a submerged obstruction in the location of the "Bat Target". It is further recommended that additional wire drag/side scan sonar work be done in this area to ascertain the nature and number of obstructions that may exist in the vicinity of Latitude 38°14'15.57408"N, Longitude 76°20'24.68551"W, the "BAT TARGET".

4) The charted PROHIBITED AREA centered around Latitude 38°13'N, Longitude 76°19'W is known as the "Hooper

Target." The area enclosed by the dashed limit is littered with debris. This information originates with Chart Letter 1382 of 1980 (CL 1382/80). The NOAA Ships RUDE and HECK are the originating unit. Subsequent to CL 1382/80 an EOD team referenced above removed six (6) additional "hazards to navigation". These six (6) hazards are most likely within the "Hooper Target" area. There are five (5) fixed targets within the PROHIBITED AREA. These targets were located using the tracking theodolites of Patuxent River. It is recommended that the PROHIBITED AREA be retained with the five (5) targets charted in the locations specified in section L. of the Descriptive Report.

5) The charted dangerous sunken wreck, PA, AWOIS Item 3433, in Latitude 38°16'16"N, Longitude 76°22'27"W, was searched for by the hydrographer with negative results. A close examination of the AWOIS "history" revealed that the wreck was not found a short time after the wreck was reported sunk, Notice to Mariners 23 of 1954 (NM 23/54). A second notice, NM 33/54, was issued to discontinue a buoy set near the wreck. Additional information in the notice stated that the area was cleared by twenty-five (25) feet. Present survey depths in the area range from twenty-six (26) to thirty-two (32) feet. A telephone conversation with Kate Braig of the Mariner's Museum in Newport News, Virginia, (804) 595-0368, found that the schooner yacht "SQUAREHEAD II" was built in Tuckertown, New Jersey in 1949 for Albert F. Schenholm. The yacht was 49.1 feet in length, had a beam of 14.1 feet and a draft of 6.9 feet. The vessel also had a 115 horsepower engine. A thorough examination of the sonargrams revealed no contacts that would have been the wreck. Also, it is believed that this wreck was salvaged shortly after it sank. This conclusion is based on several pertinent facts. First, the time between the issuance of the two (2) notices is very short. Second, at the time the second notice was issued, a drag of some sort was performed to ascertain whether or not the wreck was in the area. The depth over the wreck after it sunk was only four (4) feet (NM 23/54). The drag provided a reported depth of twenty-five (25) feet over the wreck. It is recommended that the charted dangerous sunken wreck, PA be deleted from the chart.

The present survey is adequate to supersede the charted hydrography in the common areas except as noted above.

b. Aids to Navigation

A single aid to navigation is found on the investigation for AWOIS Item # 3426. This aid appears adequate to serve its intended purpose.

8. COMPLIANCE WITH INSTRUCTIONS

This survey complies with the Project Instructions except as noted in section 4. of this report.

9. ADDITIONAL FIELD WORK

This is an adequate field examination; a recommendation for the consideration of surveying the area covered by the original Chart Evaluation Survey is found in section 6.a. of this report.

Norris A. Wike
Cartographer
Verification of Field Data

Robert G. Roberson
Supervisory Cartographer
Evaluation and Analysis

Robert G. Roberson
Supervisory Cartographer
Verification Check

INSPECTION REPORT
FE-267

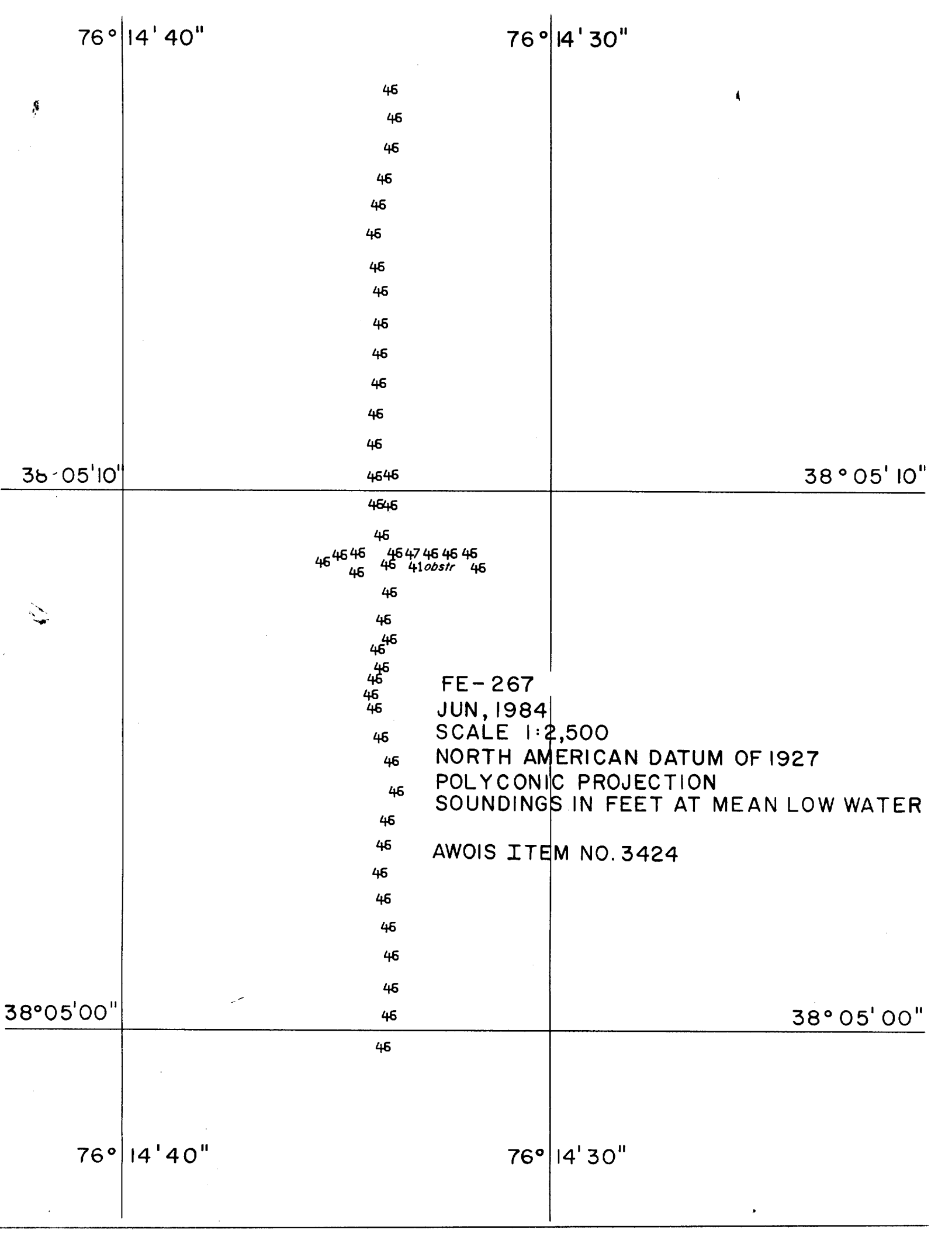
The completed survey has been inspected with regard to survey coverage, presentation of survey results, and the verification or disproval of the assigned items for investigation. The survey was found to be in compliance with National Ocean Service requirements except as noted in the Evaluation Report by the evaluator. The survey records comply with NOS requirements except where noted in the report.

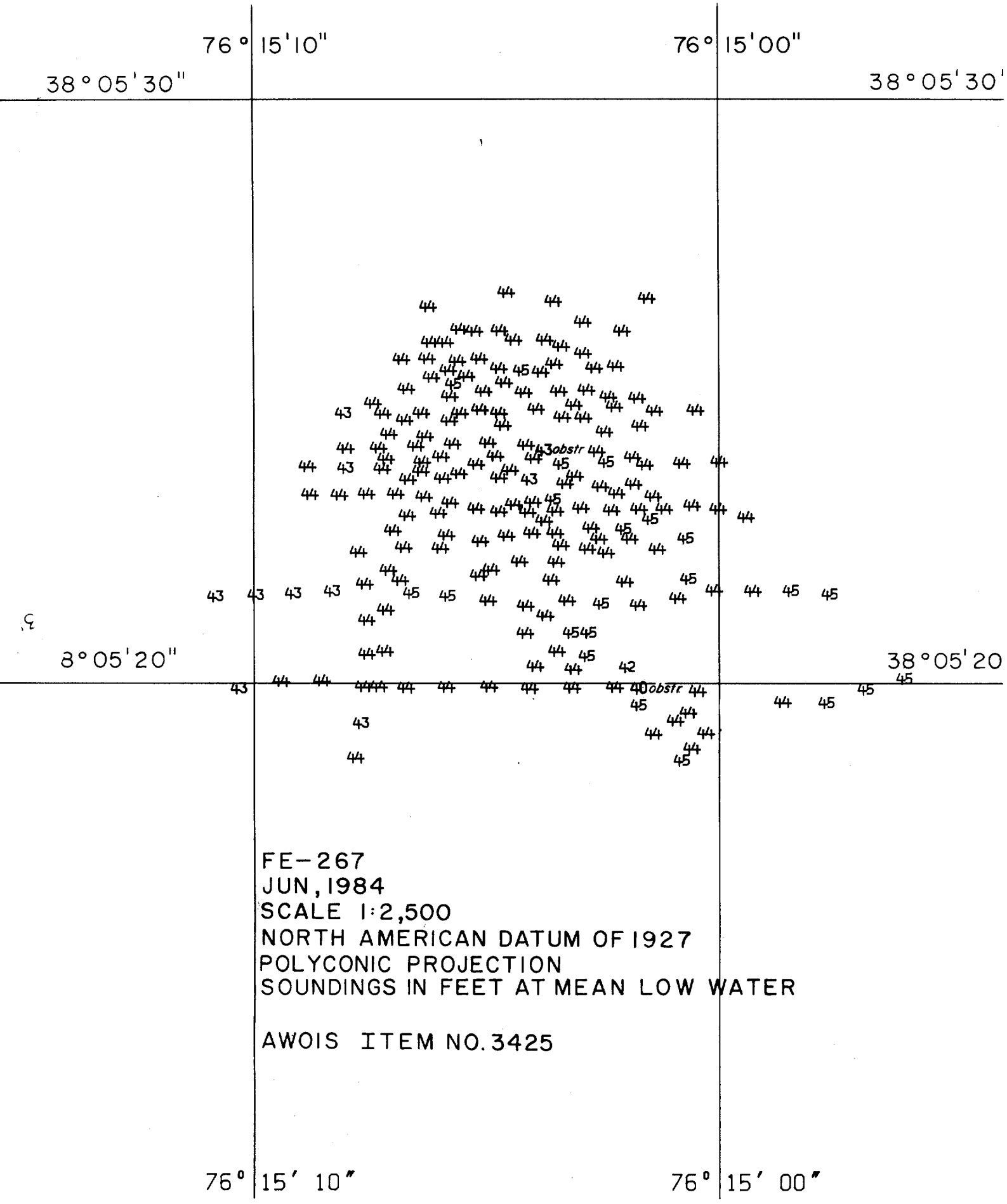
R. D. Sanocki
Chief, Hydrographic Surveys
Processing Section
Hydrographic Surveys Branch

David B. MacFarland, CDR, NOAA
Chief, Hydrographic Surveys Branch

Approved June 12, 1986

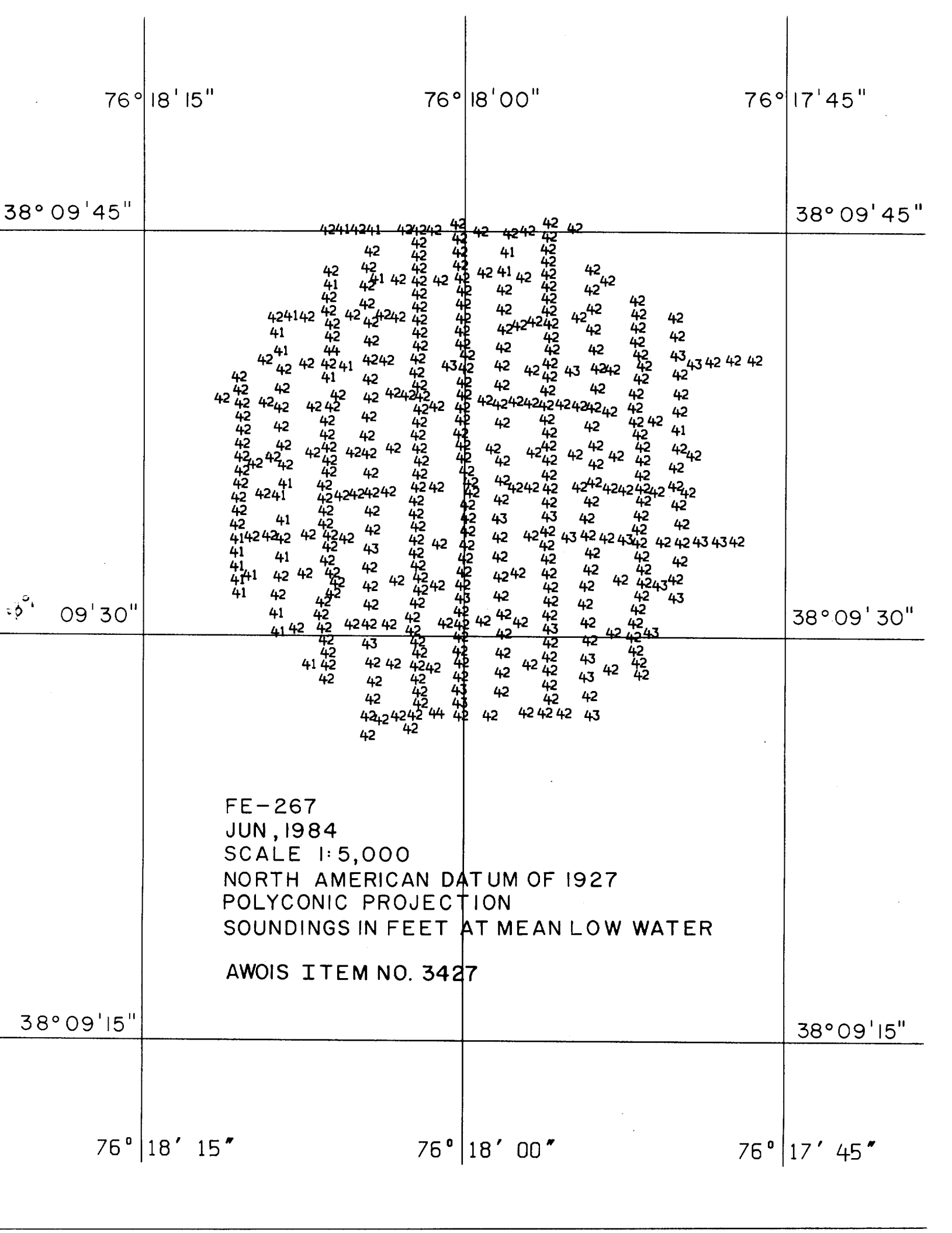
Wesley V. Hull, RADM, NOAA
Director, Atlantic Marine Center


76° 14' 40"
76° 14' 30"
38° 05' 10"
38° 05' 00"
46 47 46 46 46
41 obstr
FE-267
JUN, 1984
SCALE 1:2,500
NORTH AMERICAN DATUM OF 1927
POLYCONIC PROJECTION
SOUNDINGS IN FEET AT MEAN LOW WATER
AWOIS ITEM NO. 3424



FE-267
JUN, 1984
SCALE 1:2,500
NORTH AMERICAN DATUM OF 1927
POLYCONIC PROJECTION
SOUNDINGS IN FEET AT MEAN LOW WATER

AWOIS ITEM NO. 3425

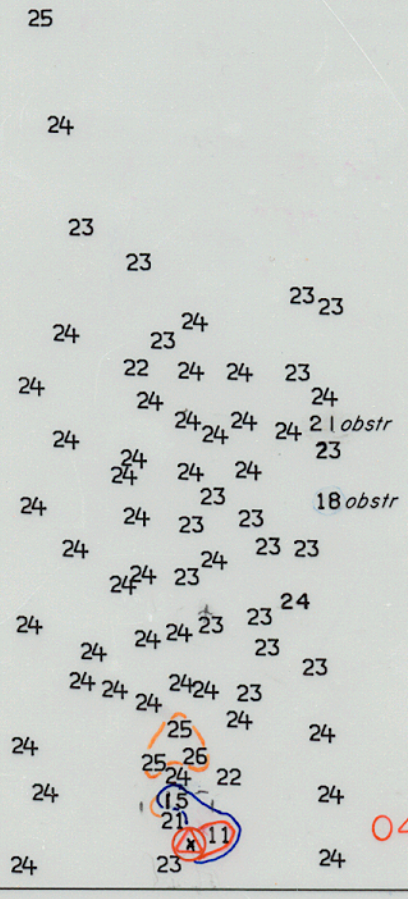

76° 18' 15"
76° 18' 00"
76° 17' 45"
38° 09' 45"
38° 09' 30"
38° 09' 15"
FE-267
JUN, 1984
SCALE 1:5,000
NORTH AMERICAN DATUM OF 1927
POLYCONIC PROJECTION
SOUNDINGS IN FEET AT MEAN LOW WATER
AWOIS ITEM NO. 3427

76° 17' 30"

76° 17' 20"

38° 07' 50"

38° 07' 40"



045 POINT NO POINT LH, 1905

24

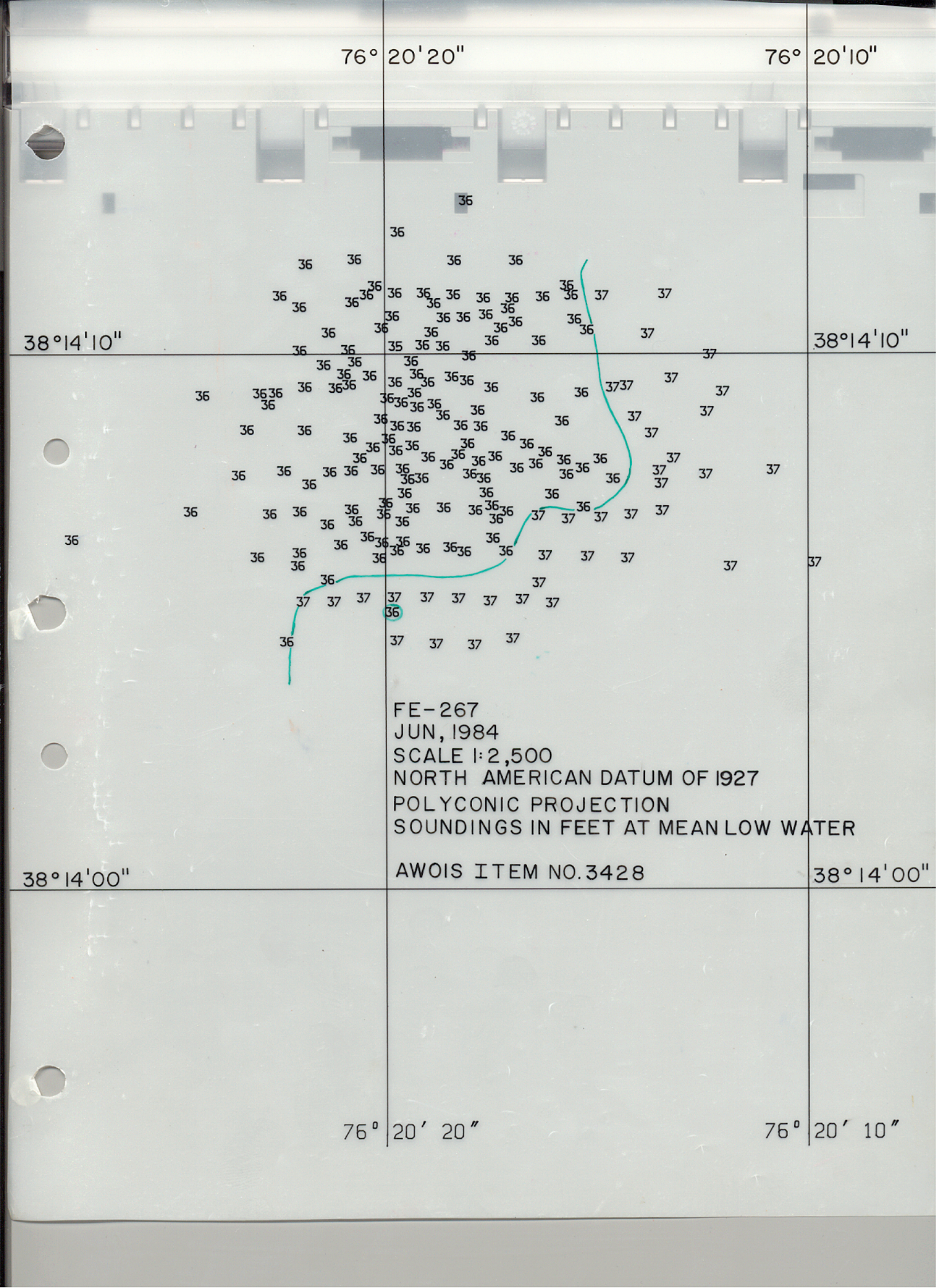
25

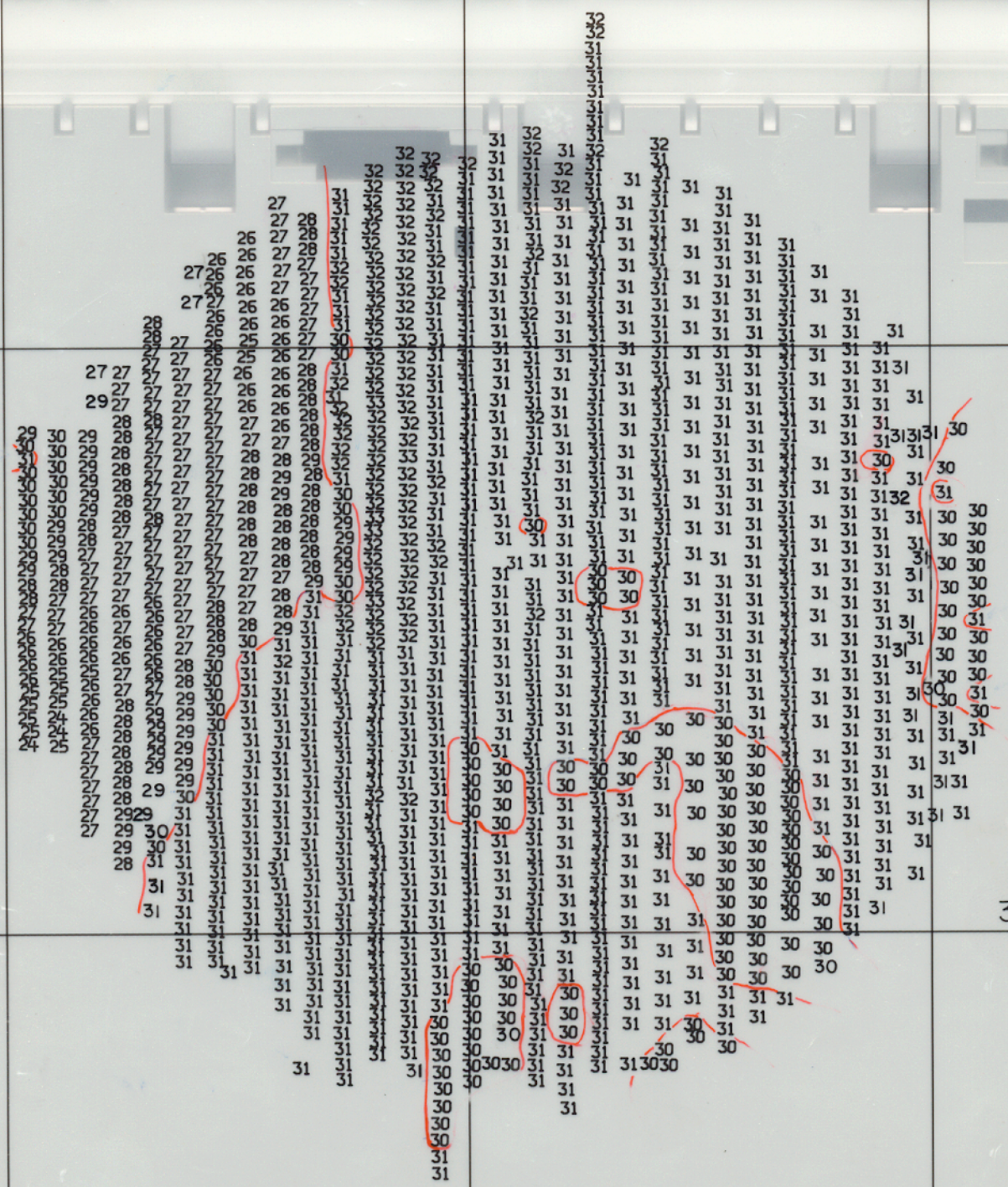
FE-267
JUN, 1984
SCALE 1:2,500
NORTH AMERICAN DATUM OF 1927
POLYCONIC PROJECTION
SOUNDINGS IN FEET AT MEAN LOW WATER

AWOIS ITEM NO. 3426

76° 17' 30"

76° 17' 20"


76° 20'20"
76° 20'10"
38°14'10"
38°14'10"
38°14'00"
38°14'00"
76° 20' 20"
76° 20' 10"
FE-267
JUN, 1984
SCALE 1:2,500
NORTH AMERICAN DATUM OF 1927
POLYCONIC PROJECTION
SOUNDINGS IN FEET AT MEAN LOW WATER
AWOIS ITEM NO. 3428

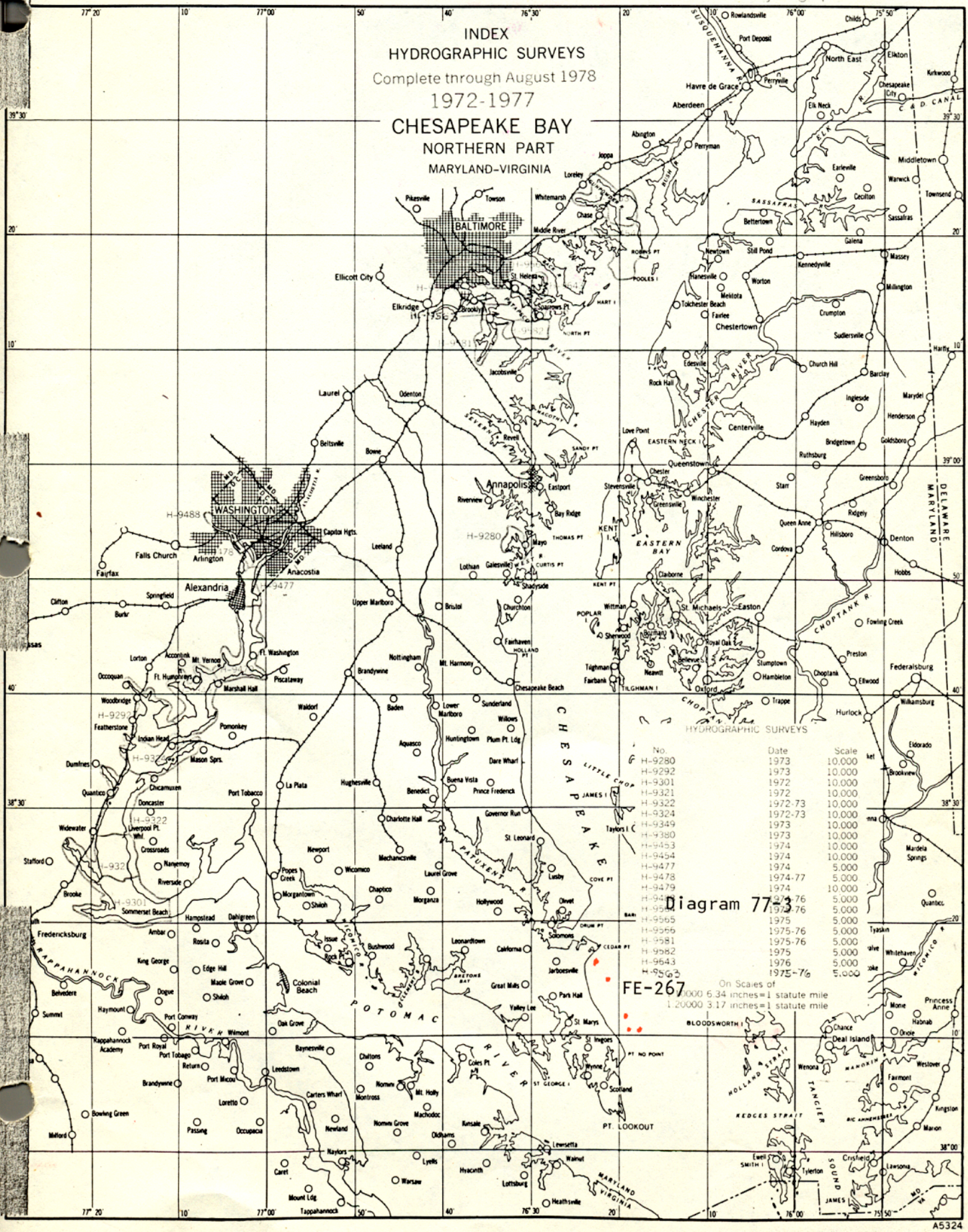


FE-267
JUN, 1984
SCALE 1:10,000
NORTH AMERICAN DATUM OF 1927
POLYCONIC PROJECTION
SOUNDINGS IN FEET AT MEAN LOW WATER

AWOIS ITEM NO. 3433

DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Survey
Rockville, Maryland

Hydrographic Index No. 68 J



NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. FE-267

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.

EXAMINED FOR NM GDBU 5/15/89 JS

CHART	DATE	CARTOGRAPHER	REMARKS
12285	6-2-87	Barbara Loretz	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. #28A - EXAM NO Corr. Fully applied
12230	7/13/87	Doug Johnson	
			Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. # 74
12264	3-10-88	Ernest V Monti	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. #42
12220	12-1-84	John Pierce	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 53
12233	2/28/90	Dan Black	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 44
12230	4/4/90	P. Piola	
			Full ~~Part~~ Before After Marine Center Approval Signed Via
			Drawing No. #15 Examine, No Correction
12260	3/14/91	L. Ackerman	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 46, Partially Superceeded by FE-275/SS
			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
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED

Material Removed From Original D.R.

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey ...Field Examination.....

Field No. .....PE-20-2-84.....

Office No......FE-267.....

LOCALITY

State .....Maryland.....

General Locality ...Chesapeake Bay.....

Locality .Point Lookout to Cedar Point...

.....

1984

CHIEF OF PARTY

.....CDR W. S. Simmons, NOAA.....

LIBRARY & ARCHIVES

DATE .....

☆U.S. GOV. PRINTING OFFICE: 1980—766-230

APPENDIX A

ELECTRONIC CONTROL PARAMETERS

WEST SHEET

1:20,000

SKEW= 112,21,64

```
FEST=30000
CLAT=4077000
CMER=76/16/38
GRID=00/01/00
PLSCL=20000
PLAT=38/03/30
PLON=76/13/18
VESNO=2830
Y4=84
ANDIST=7.0
```

EAST SHEET

1:20,000

SKEW= 112,21,64

```
FEST=30000
CLAT=4077000
CMER=76/16/38
GRID=00/01/00
PLSCL=20000
PLAT=38/05/18
PLON=76/07/43
VESNO=2830
Y4=84
ANDIST=7.0
```

PSR #3424 and #3425

1:2500

SKEW=0,20,32

```
FEST=30000
CLAT=4077000
CMER=76/16/38
GRID=00/00/10
PLSCL=2500
PLAT=38/04/54
PLON=76/15/32
VESNO=2832
Y4=84
ANDIST=0.0
```

PSR #3427

1:2500

SKEW=90,20,20

```
FEST=30000
CLAT=4077000
CMER=76/16/38
GRID=00/00/10
PLSCL=2500
PLAT=38/09/15
PLON=76/17/34
VESNO=2832
Y4=84
ANDIST=0.0
```

PSR #3428

1:2500

SKEW=90,14,16

```
FEST=30000
CLAT=4077000
CMER=76/16/38
GRID=00/00/10
PLSCL=2500
PLAT=38/13/52
PLON=76/20/00
VESNO=2831
Y4=84
ANDIST=0.0
```

PSR # 3433

NORTH SHEET
1:2500
SKEW=0,20,32

```
FEST=30000
CLAT=4077000
CMER=76/16/38
GRID=00/00/10
PLSCL=2500
PLAT=38/16/04
PLON=76/23/06
VESNO=2832
Y4=84
ANDIST=0.0
```

EAST SHEET
1:2500
SKEW=90,20,32

```
FEST=30000
CLAT=4077000
CMER=76/16/38
GRID=00/00/10
PLSCL=2500
PLAT=38/15/45
PLON=76/21/53
VESNO=2832
Y4=84
ANDIST=0.0
```

SOUTH SHEET
1:2500
SKEW=0,20,32

```
FEST=30000
CLAT=4077000
CMER=76/16/38
GRID=00/00/10
PLSCL=2500
PLAT=38/15/45
PLON=76/23/06
VESNO=2832
Y4=84
ANDIST=0.0
```

WEST SHEET
1:2500
SKEW=90,20,32

```
FEST=30000
CLAT=4077000
CMER=76/16/38
GRID=00/00/10
PLSCL=2500
PLAT=38/15/45
PLON=76/22/14
VESNO=2832
Y4=84
ANDIST=0.0
```

1:5,000
SKEW=90,20,16

```
FEST=30000
CLAT=4077000
CMER=76/16/38
GRID=00/00/15
PLSCL=~~000~~ 5000
PLAT=38/15/45
PLON=76/21/53
VESNO=2832
Y4=84
ANDIST=0.0
```

APPENDIX B

FIELD TIDE NOTE

CHESAPEAKE BAY
PROJECT: S-E404-PE-84
FIELD TIDE NOTE

Field reduction of sounding was based on predicted tides from Baltimore, Maryland. Three tide zones covered the entire project area. Predicted tide reducers were interpolated by the PDP/8 computer utilizing program AM 500. All times of predicted and recorded tides are Coordinated Universal Time.

ZONING

The following zoning correctors were applied to predicted tides at Baltimore, Maryland:

Zone 9	
High water	-4hrs, 57min,
Low water	-5hrs. 12min.
Height ratio	X 1.13
Zone 10	
High water	-5hrs. 12min.
Low water	-5hrs. 27min.
Height ratio	X 1.22
Zone 11	
High water	-5hrs. 32min.
Low water	-5hrs. 45min.
Height ration	X 1.17

On-line data aquisition utilized the predicted tide tapes from all three zones. The final field sheet only incorporated Zone 10 for plotting.

Actual Tides

It is not anticipated that smooth tides correctors will be applied to this survey. The following tide stations should be used if such correctors are applied in the future:

Hampton Roads, VA (Control)	863-8610
Kiptopeke Beach, VA	863-2200
Lewisetta, VA	863-5750
Solomons Island, MD	857-7330

APPENDIX C

GEOGRAPHIC NAME LIST

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES (Field)

SURVEY NUMBER

D-22

Name on Survey	A ON CHART NO.	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K	
Barren I Pt										1
Barren Island Gap										2
Bluff Pt										3
Cedar Pt										4
Chesapeake Bay *										5
Harper Creek										6
Hooper Islands										7
Pearson Creek										8
Pine Hill Run										9
Pons Pt										10
Potomac River										11
Point Lookout Creek										12
Pt Lookout										13
Pt Look-in										14
Pt No Point										15
Sand Pt										16
										17
										18
										19
* The only one that appears directly on the Field Sheet										20
										21
										22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

APPENDIX D

ABSTRACT OF CORRECTIONS TO ECHO SOUNDINGS

NOAA SHIP PEIRCE

1984

SETTLEMENT AND SQUAT REPORT

A Settlement and squat test was conducted on March 7, 1984 for both lauches PE-1 and PE-2 (VESNO 2831 and 2832 respectfully). The tests were conducted on the Elizabeth River using a Zeiss self-leveling level (SN 18946) positioned on the peir and a Philadelphia rod posititoned over the transducer of each launch.

Ten rod readings were observed for various speed settings of each launch, and the average reading for each speed setting was then calculated. The final corrector was determined by taking the average of the rod readings at each speed and comparing those averages with the baseline reading (the mean rod value of each launch when they were dead in the water).

Readings from the rod were taken as VESNO 2831 and 2832 approached the peir at rpm settings of : 0, 600,800,1000,1200,1400,1500,1600,1700,1800,2000,2200, and 2400. Each vessel carried two people, full fuel tanks and the equipment normally used during hydrographic operations.

A Settlement and Squat test was conducted on May 9, 1984 in 50 ft. of water for NOAA Ship Peirce. The test was ran in Chesapeake Bay by "Mo (A)" bouy located Lat 37°30'54" Lon 076°02'42".

The technique utilized the Raytheon DSF 6000N Fathometer (SN A119), recording time and depth at various throttle settings on successive passes of the bouy "Mo (A)". Though an observation of a throttle setting 0 was not observed due to high winds and current, a total of six (6) passes were done at throttle settings of 2, 4, 5, 6, 7, and 8. The ship carried its full complement, full fuel tanks and all hydrographic equipment (including two hydrographic launches).

Processing the data was done by reading the depth off the analog trace of the fathogram and correcting it to predicted tides. Correctors were determined by the change in depth over change in speed.

Attached are the graphs produced by the data recorded during these two tests.

Respectfully submitted,

Jason Maddox

ENS/NOAA

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

CORRECTIONS IN FEET, ~~FATHOMS~~

NOAA FORM 75-23 (10-76) U.S. DEPARTMENT OF COMMERCE NOAA NATIONAL OCEAN SURVEY

SETTLEMENT & SQUAT ~~XXXXXXX~~ CORRECTIONS

Ship LAUNCH PE-1 (3281) 1009

WALTER S. SIMMONS, CDR., NOAA Comdg.

These corrections are to be used

between _____ 19 84 and _____ 19 84

in the locality ELIZABETH RIVER, NORFOLK, VA

for ~~hydrographic surveys~~ Nos. PE-10-1-84
PE-20-2-84

(For deep water add a 0 to these figures)

DEPTHS IN FATHOMS

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190

RPM 30 25 20 15 10 5

SETTLEMENT & SQUAT CORRECTIONS

RPM	CORRECTIONS (FT)
0 - 850	0.0
850 - 2050	+0.2
2050 - 2325	0.0
2325 - 2550	-0.2
2550 - 2600	-0.4

-.6 -.5 -.4 -.3 -.2 -.1 0 +.1 +.2 +.3

46 1240

K+E 20 X 20 TO THE I... 7 X 10 INCHES KEUFFEL & ESSER ... MADE IN U.S.A.

☆U.S. GOV. PRINTING OFFICE: 1982 - 56...

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

CORRECTIONS IN FEET, ~~XXXXXX~~

NOAA FORM 75-21 (10-72) U.S. DEPARTMENT OF COMMERCE NOAA NATIONAL OCEAN SURVEY

SETTLEMENT & SQUAT ~~XXXXXX~~ CORRECTIONS

Ship LAUNCH PE-2 (3282) 1017

WALTER S. SIMMONS, CDR., NOAA Comdg.

These corrections are to be used

between ____ 19 84 and ____ 19 84

in the locality ELIZABETH RIVER, NORFOLK, VA

for ~~hydrographic surveys~~ Nos. PE-10-1-84
PE-20-2-84

(For deep water add a 0 to these figures)

~~DEPTHS IN FATHOMS~~

RPM

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190

250 200 150 100 50

-1.1 -1.0 -.9 -.8 -.7 -.6 -.5 -.4 -.3 -.2 -.1 0 +.1 +.2

SETTLEMENT & SQUAT CORRECTIONS

RPM	CORRECTIONS (FT)
0 - 925	0.0
925 - 1575	+0.2
1575 - 1925	0.0
1925 - 2075	-0.2
2075 - 2225	-0.4
2225 - 2375	-0.6
2375 - 2600	-0.8
2600 - 2850	-1.0

46 1240

K+E 20 X 20 TO THE IN 7 X 10 INCHES KEUFFEL & ESSER MADE IN U.S.A.

☆U.S. GOV. PRINTING OFFICE: 1982—566-4

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

CORRECTIONS IN FEET, ~~FATHOMS~~

NOAA FORM 75-21 (10-72) — U.S. DEPARTMENT OF COMMERCE — NOAA — NATIONAL OCEAN SURVEY

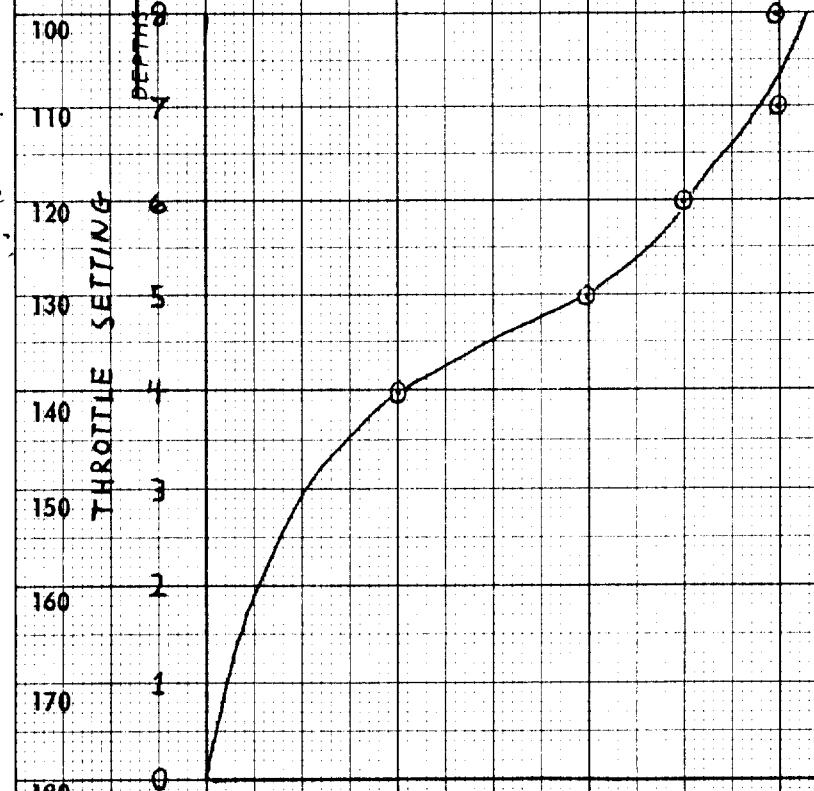
VELOCITY CORRECTIONS

Ship NOAA SHIP PEIRCE VESNO: 2830
CDR. WALTER S. SIMMONS Comdg.

These corrections are to be used
between 9 MAY 1984 and _____ 1984
in the locality CHESAPEAKE BAY

~~for hydrographic surveys Nos.~~

(For deep water add a 0 to these figures)



THROTTLE SETTING	CORRECTOR (FT)
0	0.0
1	0.0
2	0.0
3	0.2
4	0.2
5	0.4
6	0.4
7	0.6
8	0.6

☆U.S. GOV. PRINTING OFFICE: 1982—566-478

OPR S-E4[illegible]-PE-84

SOUNDING CORRECTION ABSTRACT

VESSEL 2830

FIELD SHEET NO 20-2-84
REGISTRY NO. ~~H~~ D-22

Julian Date	From Time (GMT)	To Time (GMT)	Velocity Corr. Table No.	(Note: TRA Corr. is the algebraic sum of these columns) Draft Corr	Instrument Error Corr	Initial Corr	S & S Corr	TRA Corr ft/fm	Remarks
166	130645	213136	6	+0.6*	0.0	0.0	+0.6	+1.2	A/E 8's
167	124045	143158	"	"	"	"	0.0	+0.6	A/E 0's
167	144545	150805	"	"	"	"	+0.6	+1.2	A/E 8's
167	152852	202301	"	"	"	"	0.0	+0.6	A/E 0's
167	203735	211937	"	"	"	"	+0.6	+1.2	A/E 8's
168	112253	201321	"	"	"	"	+0.6	+1.2	A/E 8's

*Draft correction of 10 ft. has been applied via corrector tape.

OPR____ —E-404-PE-84

SOUNDING CORRECTION ABSTRACT

VESSEL 2831

FIELD SHEET NO 20-2-84
REGISTRY NO. D-22

Julian Date	From Time (GMT)	To Time (GMT)	Velocity Corr. Table No.	(Note: TRA Corr. is the algebraic sum of these columns) Draft Corr	Instrument Error Corr	Initial Corr	S & S Corr	TRA Corr ft/fm	Remarks
164	164542	165544	6	0.0*	0.0	0.0	0.0	0.0	800 RPM
165	144025	201259	"	"	"	"	"	0.0	800 RPM
166	130326	162233	"	"	"	"	"	0.0	800 RPM
166	173036	174111	"	"	"	"	+0.2	+ 0.2	1500 RPM
166	174226	175835	"	"	"	"	0.0	0.0	600 RPM
166	191357	200400	"	"	"	"	-0.2	- 0.2	2400 RPM
168	151550	194047	"	"	"	"	0.0	0.0	800 RPM
170	174535	203059	"	"	"	"	"	0.0	800 RPM
171	142459	153241	"	"	"	"	"	0.0	600 RPM
L72	141907	222957	"	"	"	"	"	0.0	800 RPM
173	130258	202203	"	"	"	"	"	0.0	800 RPM

* Draft correction has been applied via corrector tape.

*

OPR____ E-404-PE-84

SOUNDING CORRECTION ABSTRACT

VESSEL 2832

FIELD SHEET NO 20-2-84
REGISTRY NO. H D-22

Julian Date	From Time (GMT)	To Time (GMT)	Velocity Corr. Table No.	(Note: TRA Corr. is the algebraic sum of these columns)					Remarks
				Draft Corr	Instrument Error Corr	Initial Corr	S & S Corr	TRA Corr ft/fm	
164	181341	185202	6	0.0*	0.0	0.0	-0.8	-0.8	2400 RPM
L65	130104	145923	"	"	"	"	"	-0.8	2400 RPM
165	151002	153845	"	"	"	"	+0.2	+0.2	1000 RPM
165	170320	211451	"	"	"	"	-0.8	-0.8	2400 RPM
166	123343	194610	"	"	"	"	"	-0.8	2400 RPM
168	131521	142219	"	"	"	"	"	-0.8	2400 RPM
168	144942	145922	"	"	"	"	-0.2	-0.2	2000 RPM
168	150906	152458	"	"	"	"	+0.2	+0.2	1500 RPM
168	153547	154147	"	"	"	"	-0.2	-0.2	2000 RPM
168	160220	161105	"	"	"	"	+0.2	+0.2	1500 RPM
170	130221	182502	"	"	"	"	-0.8	-0.8	2400 RPM

*Draft correction has been applied via corrector tape.

OPR_____ -E404-PE-84

SOUNDING CORRECTION ABSTRACT

VESSEL 2832

FIELD SHEET NO. -PE20-2-84
REGISTRY NO. ~~H~~ D-22

Julian Date	From Time (GMT)	To Time (GMT)	Velocity Corr. Table No.	(Note: TRA Corr. is the algebraic sum of these columns)					Remarks
				Draft Corr	Instrument Error Corr	Initial Corr	S & S Corr	TRA Corr ft/fm	
171	142543	153324	6	0.0*	0.0	0.0	0.0	0.0	600 RPM
171	170508	170557	"	"	"	"	+0.2	+0.2	1500 RPM
171	170937	190013	"	"	"	"	-0.8	-0.8	2400 RPM
171	192956	200213	"	"	"	"	0.0	0.0	600 RPM
173	173608	182035	"	"	"	"	+0.2	+0.2	1500 RPM
173	182649	185909	"	"	"	"	0.0	0.0	600 RPM

* Draft correction has been applied via corrector tape.

VELOCITY TAPE

(ALL VESSELS)

PE -20-2-84

TABLE #6 JD 64-173

```
000030 0 0000 0006 000 283000 020284
000095 0 0002
000170 0 0004
000235 0 0006
000335 0 0008
000430 0 0010
000520 0 0012
000607 0 0014
000715 0 0016
000800 0 0018
000890 0 0020
000980 0 0022
001070 0 0024
001170 0 0026
001260 0 0028
001330 0 0030
999999 0 0030
```

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

CORRECTIONS IN FEET, ~~FATHOMS~~

NOAA FORM 75-21 (10-72) U.S. DEPARTMENT OF COMMERCE NOAA NATIONAL OCEAN SURVEY

VELOCITY CORRECTIONS

Ship N.O.A.A. SHIP PEIRCE (VESNO 2830)

CDR. WALTER S. SIMMONS Comdg.

These corrections are to be used

between JUNE 19 84 and _____ 19___

in the locality CHESAPEAKE BAY

~~for hydrographic surveys~~ Nos. S-E404-PE-84

MARTEK CAST J.D. 165

DEPTHS IN ~~FATHOMS~~ FEET

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190

0 +1.0 +2.0 +3.0

(For deep water add a 0 to these figures)

☆U.S. GOV. PRINTING OFFICE: 1982—586-47

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

CORRECTIONS IN FEET, ~~FATHOMS~~

NOAA FORM 75-21 (10-72) U.S. DEPARTMENT OF COMMERCE NOAA NATIONAL OCEAN SURVEY

VELOCITY CORRECTIONS

Ship N.O.A.A. LAUNCH PE-1 (VESNO 2831)

CDR. WALTER S. SIMMONS Comdg.

These corrections are to be used

between JUNE 19 84 and 19

in the locality CHESAPEAKE BAY

~~for hydrographic surveys Nos.~~ S-E404-PE-84

VESNO 2831 BAR CHECK
J.D. 165-172

MARTEK CAST J.D. 165

DEPTHS IN ~~FATHOMS~~ FEET

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190

0 +1.0 +2.0 +3.0

(For deep water add a 0 to these figures)

☆U.S. GOV. PRINTING OFFICE: 1982—566-478

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

CORRECTIONS IN FEET, ~~FATHOMS~~

NOAA FORM 75-21 (10-72) U.S. DEPARTMENT OF COMMERCE NOAA NATIONAL OCEAN SURVEY

VELOCITY CORRECTIONS

Ship N.O.A.A. LAUNCH PE-2 (VESNO 2832)

CDR. WALTER S. SIMMONS Comdg.

These corrections are to be used

between JUNE 19 84 and _____ 19___

in the locality CHESAPEAKE BAY

for hydrographic surveys Nos. S-E404-PE-84

VESNO 2832 BAR CHECK
J.D. 164-171

MARTEK CAST J.D. 165

DEPTHS IN ~~FATHOMS~~ FEET

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190

0 +1.0 +2.0 +3.0

(For deep water add a 0 to these figures)

40 1240

☆U.S. GOV. PRINTING OFFICE: 1982—566-478

APPENDIX E

ABSTRACT OF CORRECTIONS TO ELECTRONIC POSITION CONTROL

ELECTRONIC CORRECTOR ABSTRACT

VESSEL : 2830 SHEET : PE20-2-84

TIME	DAY	PATTERN 1	PATTERN 2
130645	166	+00002	+00001
140828		+00006	+00000
171036		+00002	+00001
195419		+00006	+00000
124045	167	+0000X2	+00002 1
155322		+00006	+00000
192841		+00001	+00006
203735		+00001	00000
205000			
~~144545~~	167	~~+00001 2~~	~~+00002 1~~
205002 → 210037		00001 → +00006	+00000
112253	168	+00006	+00000
113918		+00001	+00000
175704		+00000	+00002

GFT
12/3/84

ELECTRONIC CORRECTOR ABSTRACT

VESSEL : 2831 SHEET : PE20-2-84

TIME	DAY	PATTERN 1	PATTERN 2
164542	164	+00001	-00001 2
144025	165	+00001	-00001 2
130326	166	+00001	-00002
173036	166	+00001	-00002
191357	166	+00003 1	-00002
151550	168	-00002	+00001
180519	168	-00002	+00001
174535	170	-00002	+00001
191435	170	-00002	+00001
142359	171	-00002	+00001
131121	172	-00002	+00001
130258	173	-00002	+00001
165415	173	-00002	+00001

GFT
14/3/84

ELECTRONIC CORRECTOR ABSTRACT

VESSEL : 2832 SHEET : PE20-2-84

TIME	DAY	PATTERN 1	PATTERN 2
181341	164	+00008 3	+00001 ~~-00001~~
130104	165	+00001	+00003
144638		+00008 3	+00001
123343	166	+00002 3	+00001
131319		+00001	+00003
~~162224~~ 135302		+00003	+00001
131232	168	+00003	-00001
141519		-00001	+00003
183000	168	-00001	+00003
130221	170	-00001	+00008 3
205500	170	- 00001	+ 00001
142543	171	-00001	+00003
170508	171	-00001	+00008 3
173608	173	-00001	+00003

GFT
12/3/84

APPENDIX G

ABSTRACT OF POSITIONS

ABSTRACT OF POSITIONS

REGISTRY NO. D-22 FIELD SHEET NO. PE20-1-84 VESNO: 2830

Julian Day	Positions From	To	Control	S1	M	S2	Remarks
166	6000	6024	R/R MR	44	0	46	XL, MS
166	6644	6716	R/R MR	45	0	47	MS, XL
166	6717	6774	R/R MR	44	0	46	MS, XL
166	6775	6816	R/R MR	45	0	47	MS
167	6817	6844	R/R MR	44	0	46	BS, MS
167	6845	6861	R/R MR	45	0	47	BS,
167	6862	6869	R/R MR	46	0	45	BS
167	6870	6890	R/R MR	46	0	47	XL
167	6891	6898	R/R MR	45	0	47	XL
168	7000	7009	R/R MR	45	0	47	XL
168	7010	7061	R/R MR	46	0	47	XL, M/S, XL
168	7062	7120	R/R MR	47	0	43	M/S, XL

JPR S-E-404-PE-84

POSITION DATA SHEET

LAUNCH 2830 SHEET PE-20-2-84 REGISTRY NO. H- D-22-

Jul Day	First Pos. No.	Time (GMT)	Last Pos. No.	Time (GMT)	Development Positions	Detached Positions	Rejected Positions	Duplicate Positions	Omitted Positions	Bottom Samples
166	6000	130645	6816	213136	----------	----------	6024,6715 6716,6745	----------	6025-6643 6798	----------
							6773,6774			
167	6817	124045	6898	211937	----------	----------	6822,6823 6828,6830	----------	----------	6817-6831 6843-6869
							6847			
168	7000	112253	7120	201321	----------	----------	----------	----------	----------	----------

ABSTRACT OF POSITIONS

REGISTRY NO. D-22 FIELD SHEET NO. PE20-2-84 VESNO: 2831

Julian Day	Positions From	To	Control	S1	M	S2	Remarks
164	0001	0059	R/R MR	44	0	46	Side Scan
165	0060	0154	R/R MR	44	0	46	Side Scan & Dev on Shoal
166	155	312	R/R MR	44	0	46	Side Scan & Dev & M/S East sheet
168	313	371	R/R MR	47	0	43	Side Scan PSR 3433
170	372	393	R/R MR	47	0	43	Side Scan PSR 3428
170	394	430	R/R MR	47	0	43	Side Scan PSR 3433
171	431	440	R/R MR	47	0	43	Side Scan PSR 3428
172	441	591	R/R MR	47	0	43	Side Scan PSR 3433
173	594	735	R/R MR	47	0	43	Side Scan PSR 3433

OPR E 404-PL 04

POSITION DATA SHEET

LAUNCH 2831 SHEET PE 20-2-84 REGISTRY NO. H-D-22

Jul Day	First Pos. No.	Time (GMT)	Last Pos. No.	Time (GMT)	Development Positions	Detached Positions	Rejected Positions	Duplicate Positions	Omitted Positions	Bottom Samples
164	0001	164542	0016	170830	---	---_---	----	--------	--------	-------
164	0017	DSP	0059	DSP	(Retain Data DSP)					
165	0060	144025	0154	201259	127-154	0089+ 3½ : least depth 0094+2¼:least depth				
						0107-0112: coverage abstract 0124+3: least depth				
						0127: detached position				
166	0155	130326	0312	200400	261-283	----------	290; 296+3-296+4	--------	----------	----------
168	0313	151550	0317	194047	313-371 side scan	---------	----------	---------	----------	----------
170	0372	174535	0430	203059	372-430 side scan	----------	382	----------	---------	----------
171	0431	142459	0440	153241	431-440	---------	----------	----------	----------	----------
172	0441	131121	0591	222957	441-591	---------	----------	---------	----------	----------
173	0594	130258	0735	202203	594-735	----------	592-593	---------	----------	----------

ABSTRACT OF POSITIONS

REGISTRY NO. D-22 FIELD SHEET NO. PE20-2-84 VESNO: 2832

Julian Day	Positions From	To	Control	S1	M	S2	Remarks
164	3000	3017	R/R MR	44	0	46	Main Scheme
165	3018	3040	R/R MR	46	0	45	Main Scheme, Development
165	3040	3141	R/R MR	44	0	46	M/S
166	3142	3153	R/R MR	44	0	46	XL - west
166	3156	3160	R/R MR	46	0	45	M/S west
166	3161	3289	R/R MR	44	0	46	M/S east
168	3292	3307	R/R MR	45	0	47	M/S west
168	3308	3342	R/R MR	47	0	43	XL, Star Search, B.S.
170	3501	3542	R/R MR	47	0	43	XL, M/S
171	3545	3643	R/R MR	47	0	43	Dev. M/S, Dev.
173	4000	4047	R/R MR	47	0	43	Star Search - Dev.

OPR S-E404- 84

POSITION DATA SHEET

LAUNCH 2832 SHEET PE-20-2-84 REGISTRY NO. ~~H-~~ D-22

Jul Day	First Pos. No.	Time (GMT)	Last Pos. No.	Time (GMT)	Development Positions	Detached Positions	Rejected Positions	Duplicate Positions	Omitted Positions	Bottom Samples
164	3000	181341	3017	185202	----------	----------	----------	----------	----------	----------
165	3018	130104	3141	211451	3049-3067	3056	3022+1-3023 3109+1-3109+6 3123+1-3123+7	--------	----------	----------
166	3142	123343	3289	194610	---------	3183	3154-3155 3182			
							3184-3187 3274+1-3278			
168	3292	131521	3342	161105	3323-3330	---------	3290-3291 3335 ~~3337-3338~~	---------	---------	3313 3322
							3343			3336 3541-3544
170	3501	130221	3542	182502	----------	----------	3514-3518	3541-3542	---------	----------
171	3545	142543	3643	200213	3545-3554 3599-3627	---------	---------	---------	3543-3544	----------
173	4000	173608	4047	185909	4000-4047	---------	----------	----------	----------	----------

APPENDIX H

BOTTOM SAMPLES

NOAA FORM 75-44
(11-72)

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

OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

VESSEL	PROJ. NO.	YEAR		CHECKED BY	DATE CHECKED
PEIRCE S-283	S-E404-PE-84	84	PE-20-2-84	BM	6-19-84

Fix no.	DATE	SAMPLE POSITION		DEPTH Ft	WEIGHT OF SAMPLER	APPROX. PENETRATION	LENGTH OF CORE	COLOR OF SEDIMENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, cohesiveness, dented cutter, stat. no., type of bottom relief i.e., slope, plain, disposition, etc.)	OBS. INIT.
		LATITUDE 38°	LONGITUDE 76°								
6817	15Jun1984	16/22	16/03	40.6	50lbs.	---	---	gy	M, fne S		
6818	"	16/08	17/09	40.1	"	---	---	gy	M		
6819	"	15/55	18/23	39.3	"	---	---	gy	M, fne S		
6820	"	15/38	19/33	40.1	"	---	---	gy	M		
6821	"	13/55	17/53	56.7	"	---	---	gy	M		
6824	"	14/31	16/53	49.2	"	---	---	gy	M		
6825	"	15/07	15/51	45.5	"	---	---	gy	M, fne S		
6826	"	15/38	14/51	44.0	"	---	---	gy	M, fne S		
6827	"	16/11	13/46	43.0	"	---	---	gy	M, fne S		
6829	"	16/43	12/47	42.4	"	---	---	gy	fne S		
6831	"	17/08	11/53	42.4	"	---	---	gy	M, fne S		
6843	"	16/33	08/02	121.1	"	---	---	gy	M, fne S		
6844	"	17/21	08/59	49.9	"	---	---	gy	M, fne S	Pos: 6847 No Sample	
6845	"	13/49	16/23	53.0	"	---	---	gy	M, fne S		
6846	"	14/38	16/52	55.0	"	---	---	gy	M, fne S		
6848	"	15/35	17/53	58.7	"	---	---	gy	M, fne S		
6849	"	16/31	17/35	60.4	"	---	---	gy	M, fne S, brk Sh		

Use more than one line per sample if necessary.

☆U.S. Government Printing Office: 1975 — 665-661/1130, Region No. 6

NOAA FORM 75-44
(11-72)

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

OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

VESSEL	PROJ. NO.	YEAR		CHECKED BY	DATE CHECKED
PEIRCE 2830	S-E404-PE-84	84	PE-20-2-84	BM	6-19-84

SERIAL NO.	DATE	SAMPLE POSITION		DEPTH Ft. (XXXXXX)	WEIGHT OF SAMPLER	APPROX. PENETRATION	LENGTH OF CORE	COLOR OF SEDIMENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, cohesiveness, dented cutter, stat. no., type of bottom relief i.e., slope, plain, disposition, etc.)	OBS. INIT.
		LATITUDE 38°	LONGITUDE 76°								
6850	15Jun1984	17/29	18/11	57.4	50lbs	---	---	gy	M, fne S		
6851	"	18/09	19/50	47.1	"	---	---	gy	M, fne S		
6852	"	17/01	19/18	46.3	"	---	---	gy	M, fne S	Coal in sample	
6853	"	16/01	18/43	46.6	"	---	---	gy	M, fne S, brk Sh		
6854	"	15/06	18/28	45.0	"	---	---	gy	M, fne S, brk Sh		
6855	"	14/09	17/59	45.6	"	---	---	gy	M, fne S, brk Sh		
6856	"	13/21	17/32	46.4	"	---	---	gy	M, fne S	Pumice and coal in sample	
6857	"	12/25	17/05	45.2	"	---	---	gy	M, fne S		
6858	"	11/32	16/39	44.1	"	---	---	gy	M, fne S		
6959	"	09/00	13/58	49.7	"	---	---	gy	M		
6860	"	10/47	14/38	54.4	"	---	---	gy	M, fne S		
6861	"	10/00	14/33	50.7	"	---	---	gy	M		
6862	"	08/52	14/00	97.2	"	---	---	gy	M		
6863	"	07/58	13/38	99.5	"	---	---	gy	M		
6864	"	07/03	13/11	93.7	"	---	---	gy	fne S		
6865	"	07/42	12/01	38.0	"	---	---	gy	fne S		
6866	"	08/38	12/23	39.6	"	---	---	gy	fne S		

Use more than one line per sample if necessary.

☆U.S. Government Printing Office: 1975 – 665-661/1130, Region No. 6

NOAA FORM 75-44
(11-72)

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

OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

VESSEL	PROJ. NO.	YEAR		CHECKED BY	DATE CHECKED
PEIRCE	S-E4O4-PE-84	84	PE-20-2-84	BM	6-19-84

SERIAL NO.	DATE	SAMPLE POSITION		DEPTH Ft	WEIGHT OF SAMPLER	APPROX. PENETRATION	LENGTH OF CORE	COLOR OF SEDIMENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, cohesiveness, dented cutter, stat. no., type of bottom relief i.e., slope, plain, disposition, etc.)	OBS. INIT.
		LATITUDE 38°	LONGITUDE 76°								
6867	15Jun1984	09/39	12/50	55.7	50lbs	---	---	gy	M		
6868	"	10/32	13/16	49.5	"	---	---	gy	fne S		
6869	"	11/24	13/50	76.6	"	---	---	gy	M		
6899	"	09/19	09/36	26.0	"	---	---	gy	crs S		

Use more than one line per sample if necessary.

☆U.S. Government Printing Office: 1975 – 665-661/1130, Region No. 6

NOAA FORM 75-44
(11-72)

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

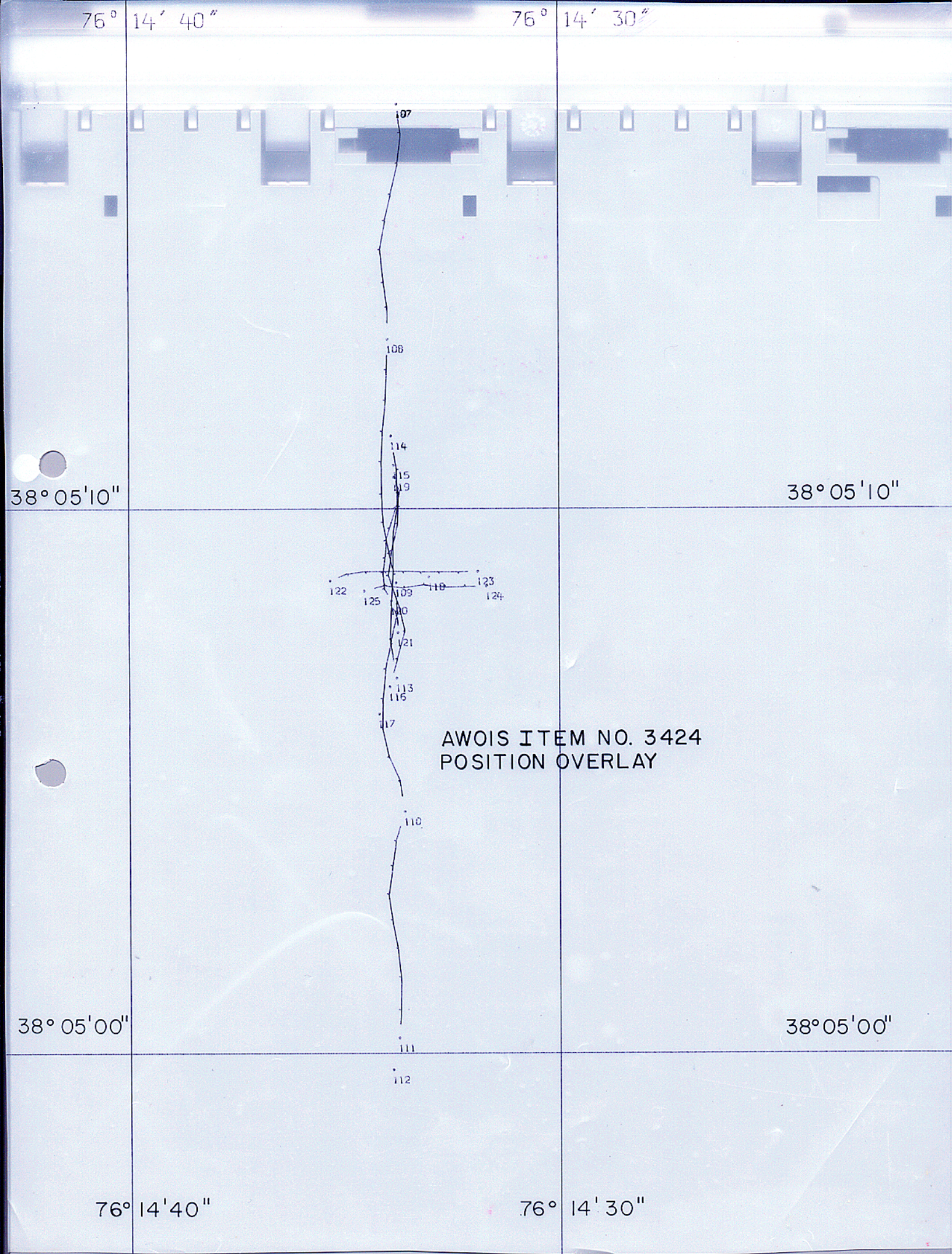
OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

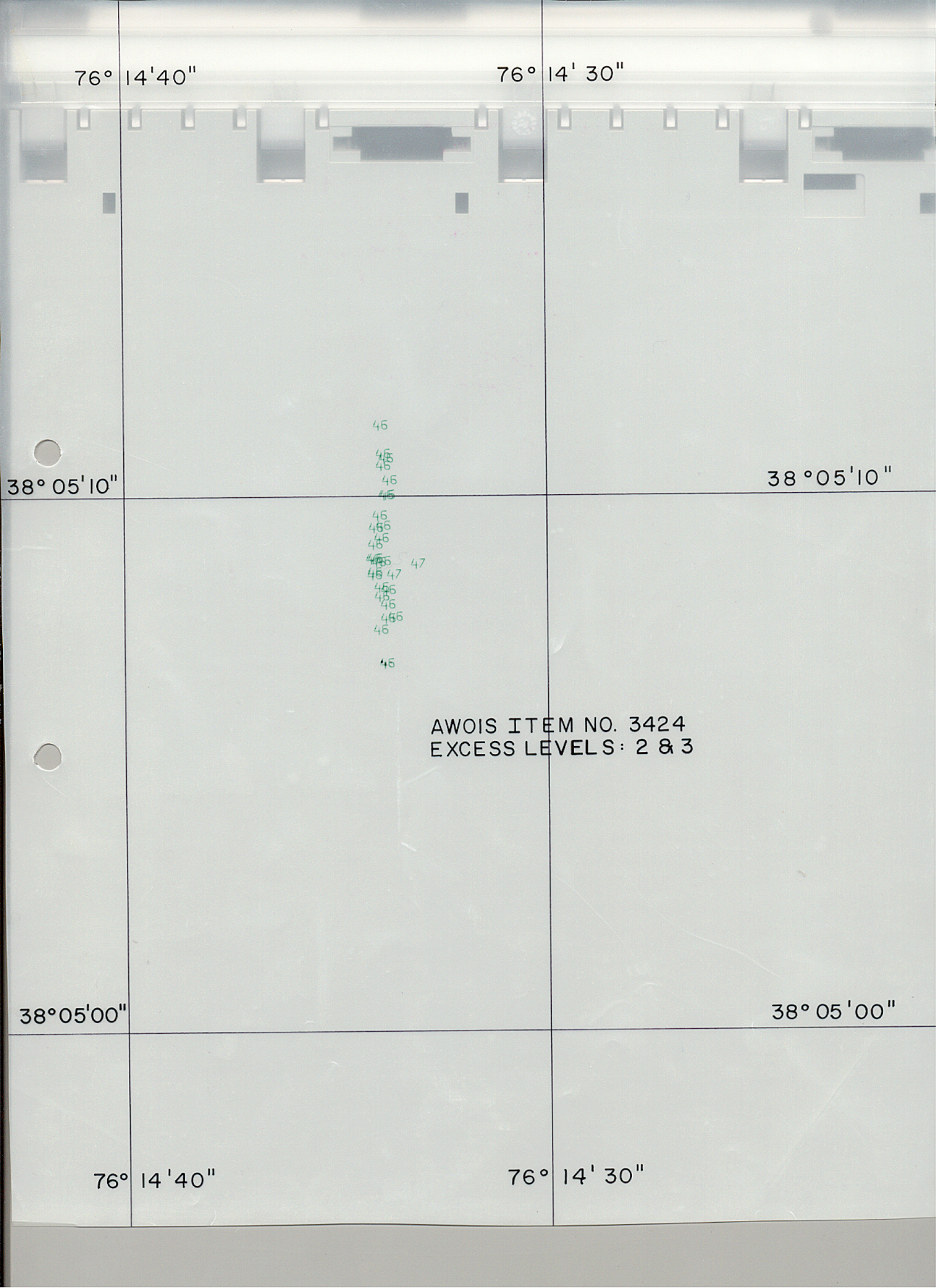
VESSEL	PROJ NO.	YEAR		CHECKED BY	DATE CHECKED
PEIRCE 2832	S-E404-PE-84	84	PE-20-2-84	Bm	6-19-84

SERIAL NO.	DATE	SAMPLE POSITION LATITUDE 38°	SAMPLE POSITION LONGITUDE 76°	DEPTH ft. (XX(XXX)	WEIGHT OF SAMPLER	APPROX. PENETRATION	LENGTH OF CORE	COLOR OF SEDIMENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, cohesiveness, dented cutter, stat. no., type of bottom relief i.e., slope, plain, disposition, etc.)	OBS INIT
3313	16Jun1984	15/26	21/01	30.4	51bs.	---	---	gy	M fne S/M		VB
3322	"	13/26	20/24	30.7	"	---	---	gy	M fne S/M		VB
3336	"	12/29	20/05	35.6	"	---	---	gy	M fne S/M		VB
3543	19Jun1984	11/30	19/48	40.0	"	---	---	gy	fne S		JM

Use more than one line per sample if necessary.

* U.S. GOVERNMENT PRINTING OFFICE 1978—865-018/1084


76° 14' 40"
76° 14' 30"
38° 05'10"
38° 05'10"
38° 05'00"
38° 05'00"
76° 14'40"
76° 14'30"
107
108
114
115
119
122
125
109
110
123
124
120
121
113
116
117
118
111
112
AWOIS ITEM NO. 3424
POSITION OVERLAY

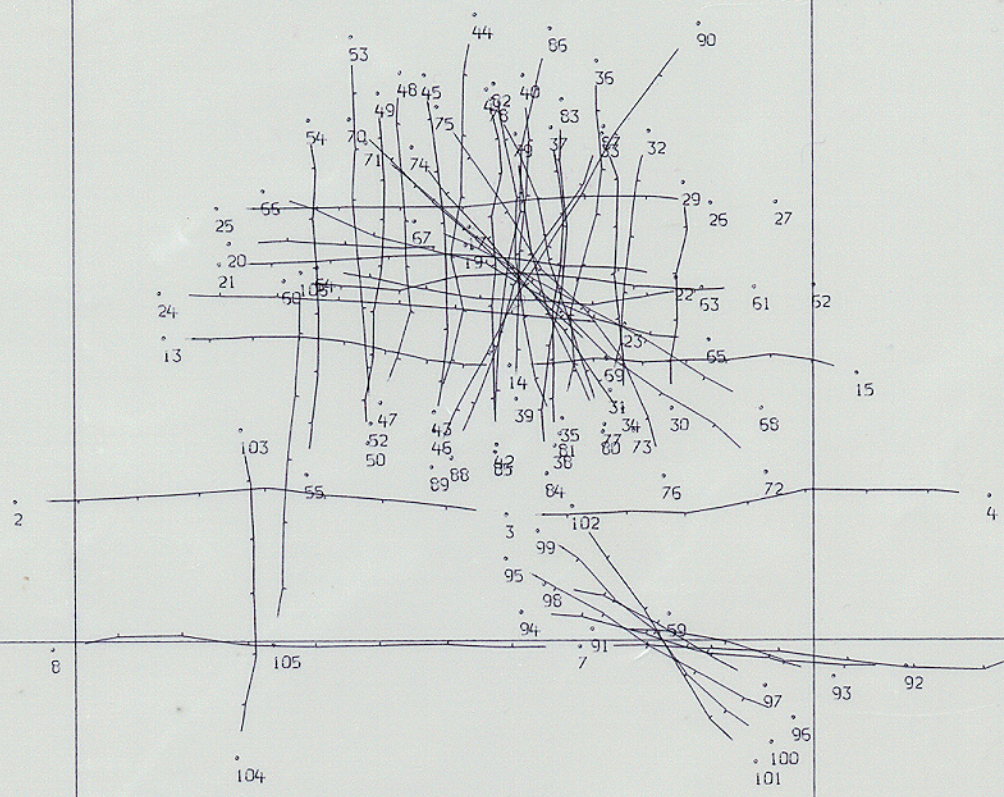

76° 14'40"
76° 14' 30"
38° 05'10"
38° 05'10"
46
47
AWOIS ITEM NO. 3424
EXCESS LEVELS: 2 & 3
38°05'00"
38° 05'00"
76° 14'40"
76° 14' 30"

76° 15' 10"

76° 15' 00"

38° 05' 30"

38° 05' 30"



38° 05' 20"

38° 05' 20"

FE-267SS
AWOIS ITEM NO. 3425
POSITION OVERLAY

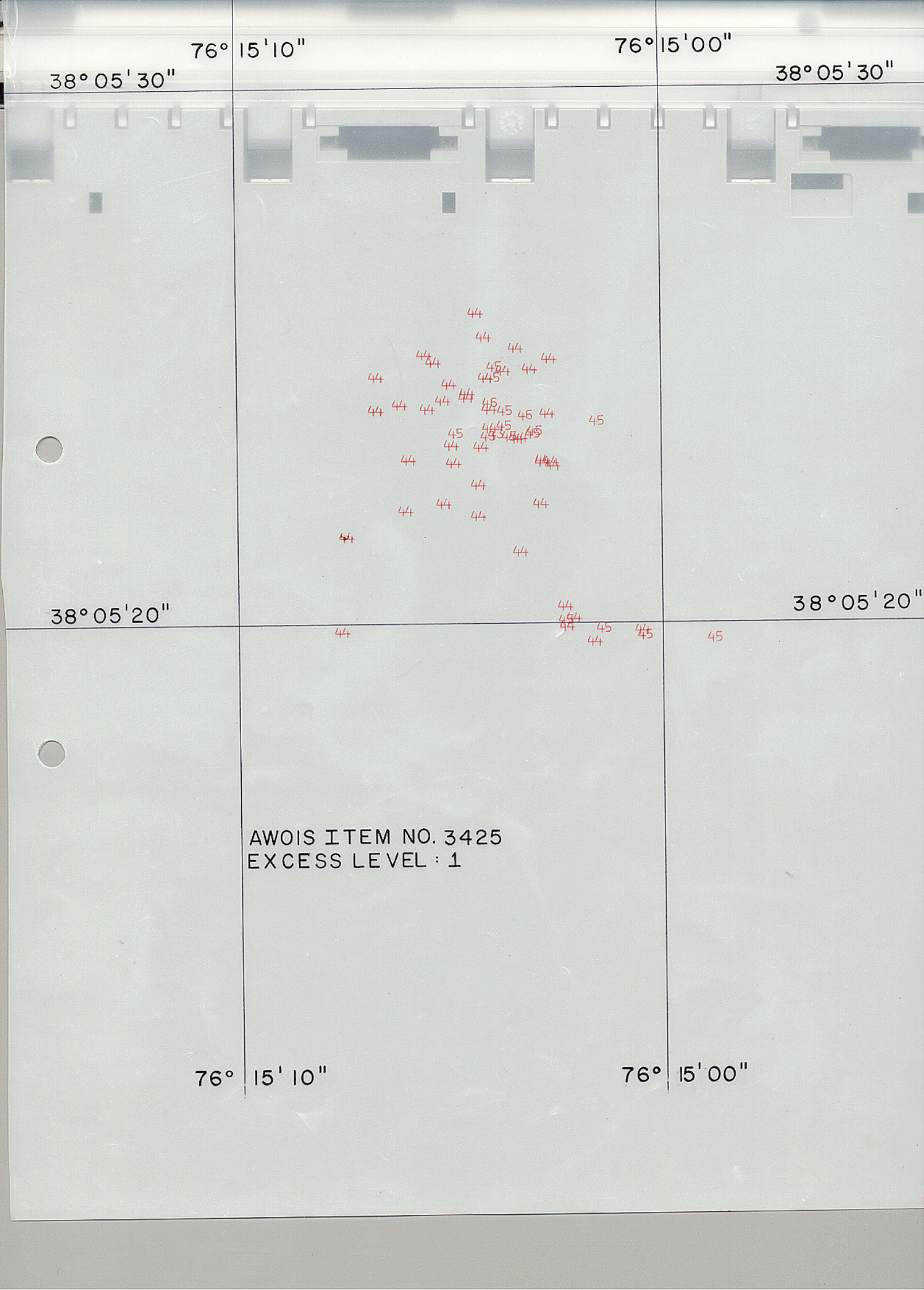
76° 15' 10"

76° 15' 00"

76° 15' 10"

38° 05' 10"

76° 15' 00"

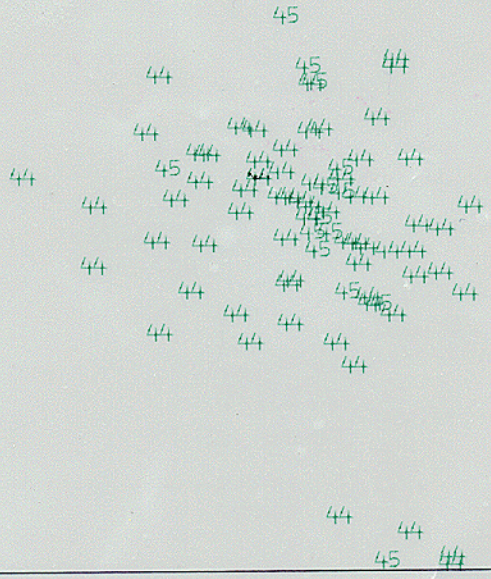

76° 15'10"
76° 15'00"
38° 05'30"
38° 05'20"
AWOIS ITEM NO. 3425
EXCESS LEVEL : 1

76° 15'10"

76° 15'00"

38° 05' 30"

38° 05' 30"



38° 05' 20"

38° 05'20"

AWOIS ITEM NO. 3425
EXCESS LEVEL: 2&3

76° 15' 10"

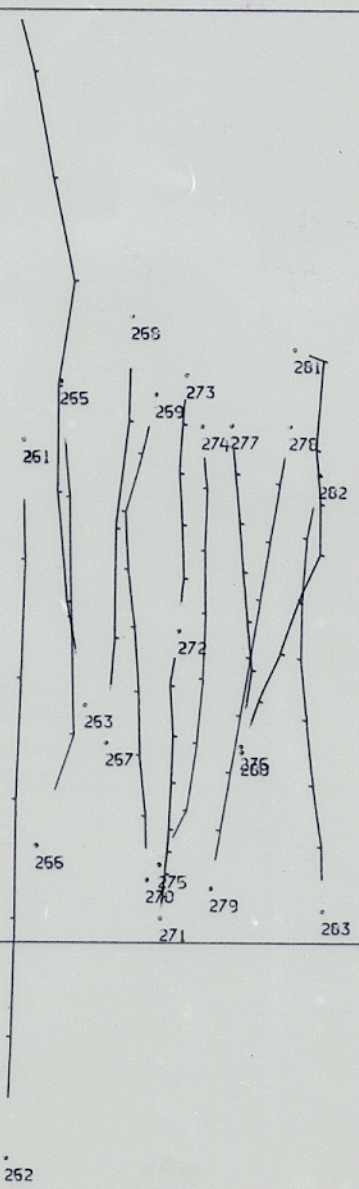
76° 15' 00"

76° 17' 30"

76° 17' 20"

38° 07' 50"

38° 07' 50"



38° 07' 40"

38° 07' 40"

AWOIS ITEM NO. 3426
POSITION OVERLAY

76° 17' 30"

76° 17' 20"

76° 17'30"

76° 17'20"

38° 07'50"

38° 07'50"

24

24

23

24

24

25

25

21

38° 07'40"

38° 07'40"

AWOIS ITEM NO. 3426
EXCESS LEVEL: 1

76° 17'30"

76° 17'20"

76° 17' 30"

76° 17' 20"

38° 07' 50"

38° 07' 50"

24

24

24

24

24

24

24

24

38° 07' 40"

38° 07' 40"

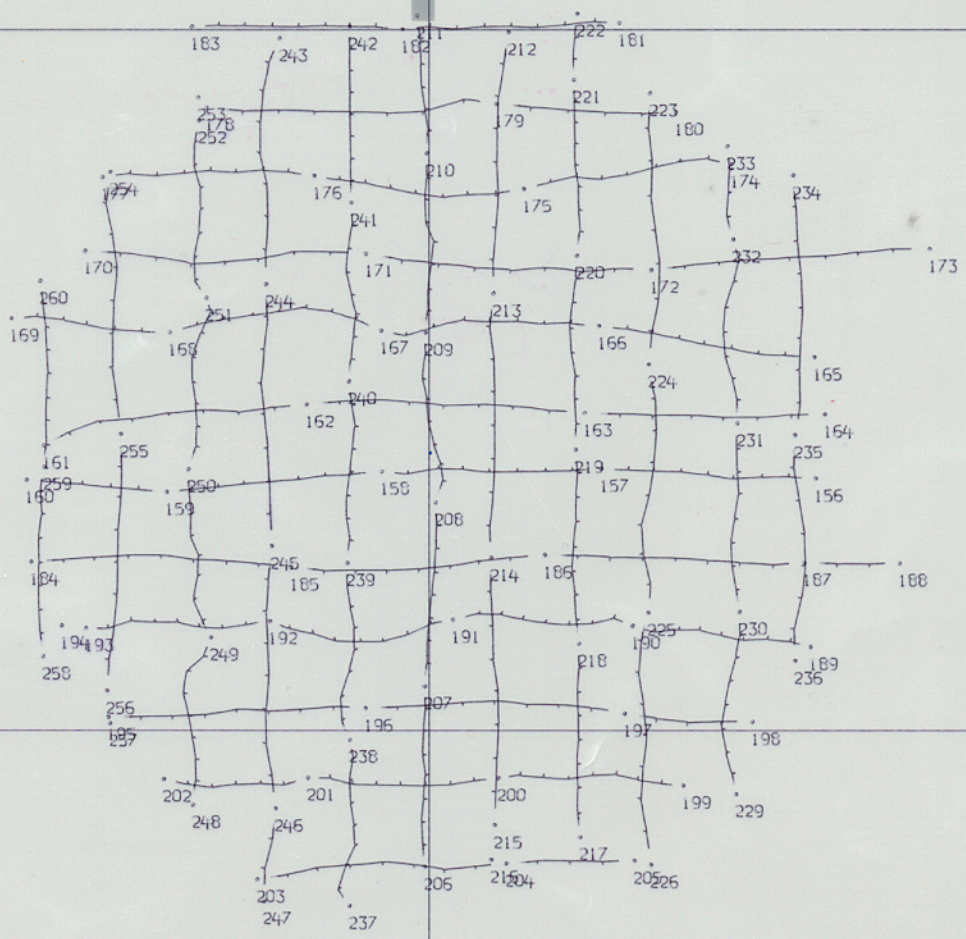
AWOIS ITEM NO. 3426
EXCESS LEVELS: 2 & 3

76° 17' 30"

76° 17' 20"

76° 18' 15" 76° 18' 00" 76° 17' 45"

38° 09' 45" 38° 09' 45"

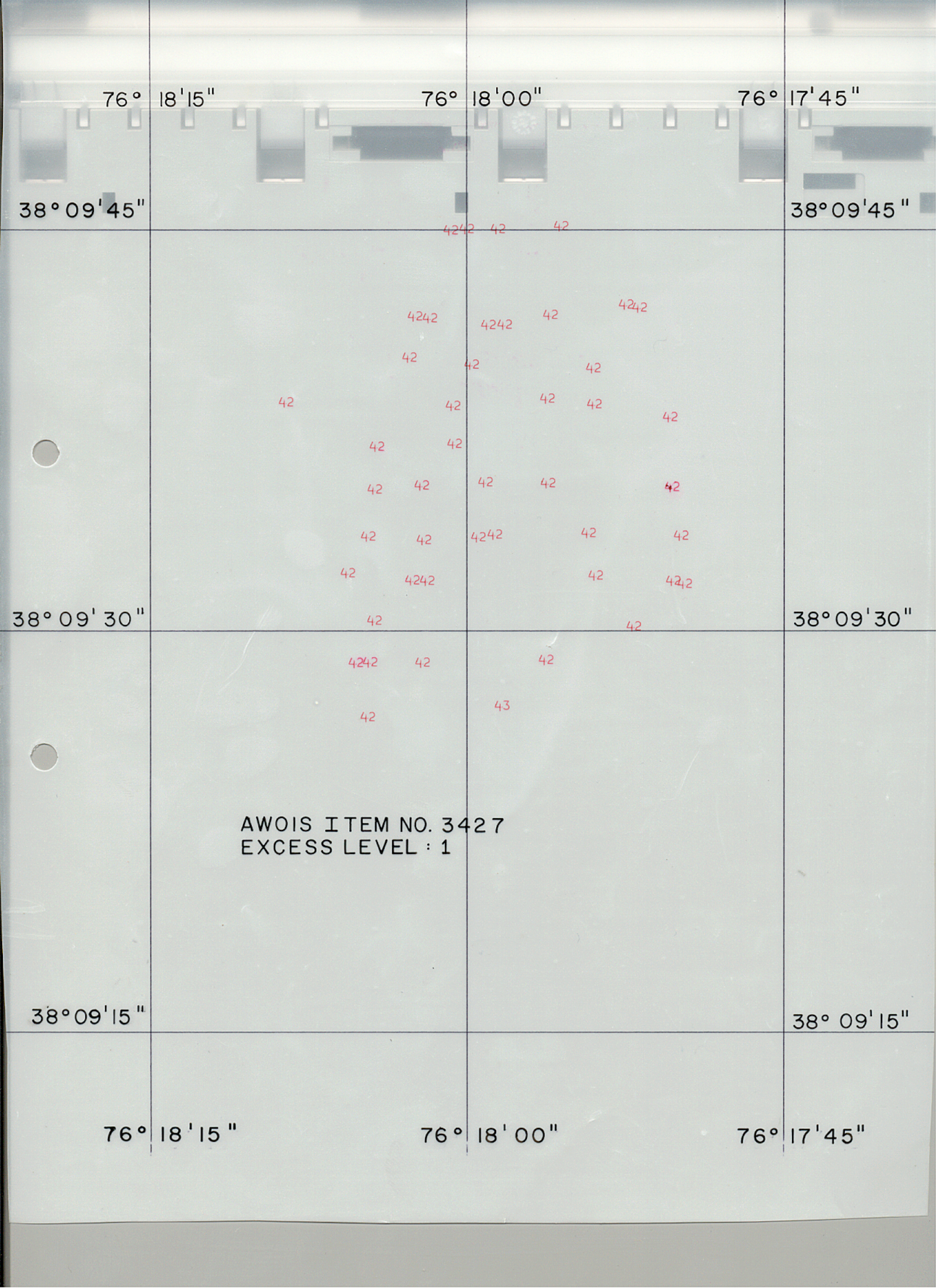


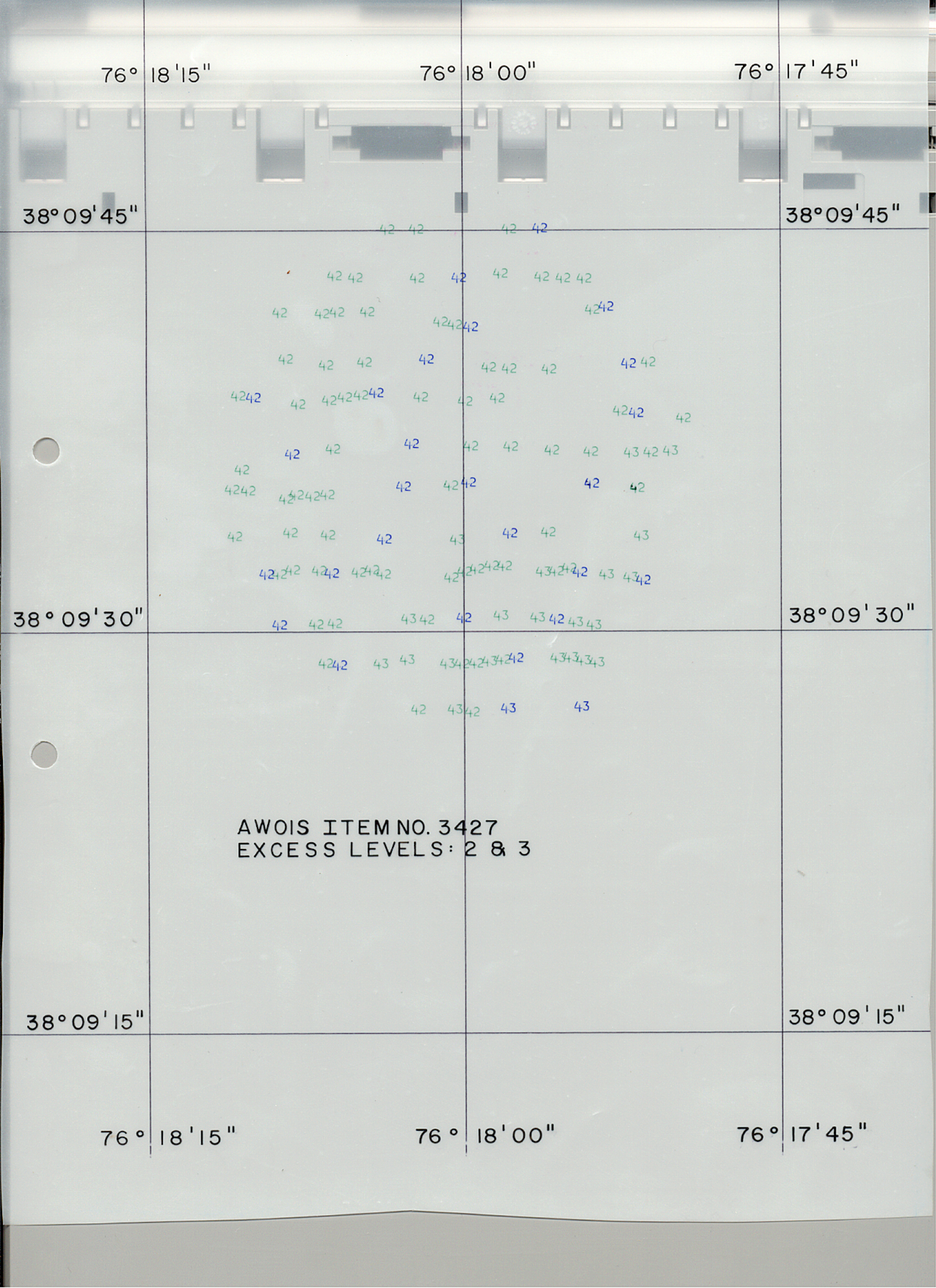
38° 09' 30" 38° 09' 30"

FE-267SS
AWOIS ITEM NO. 3427
POSITION OVERLAY

38° 09' 15" 38° 09' 15"

76° 18' 15" 76° 18' 00" 76° 17' 45"


76° 18'15"
76° 18'00"
76° 17'45"
38° 09'45"
38° 09'30"
38° 09'15"
42
43
AWOIS ITEM NO. 3427
EXCESS LEVEL : 1

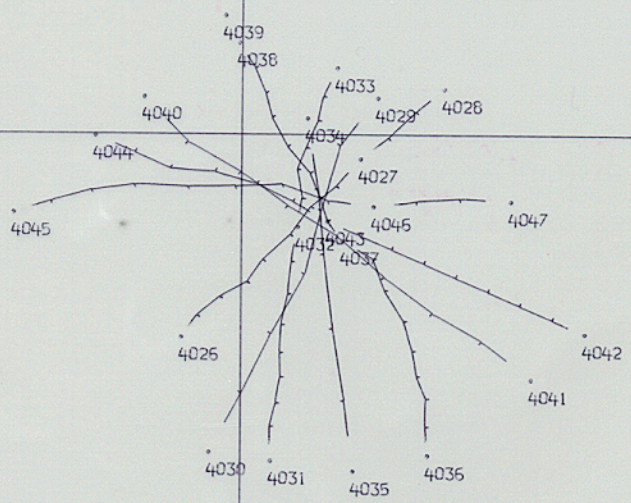

76° 18'15"
76° 18'00"
76° 17'45"
38°09'45"
38°09'30"
38°09'15"
AWOIS ITEM NO. 3427
EXCESS LEVELS: 2 & 3

76° 20' 20"

76° 20' 10"

38° 14' 10"

38° 14' 10"



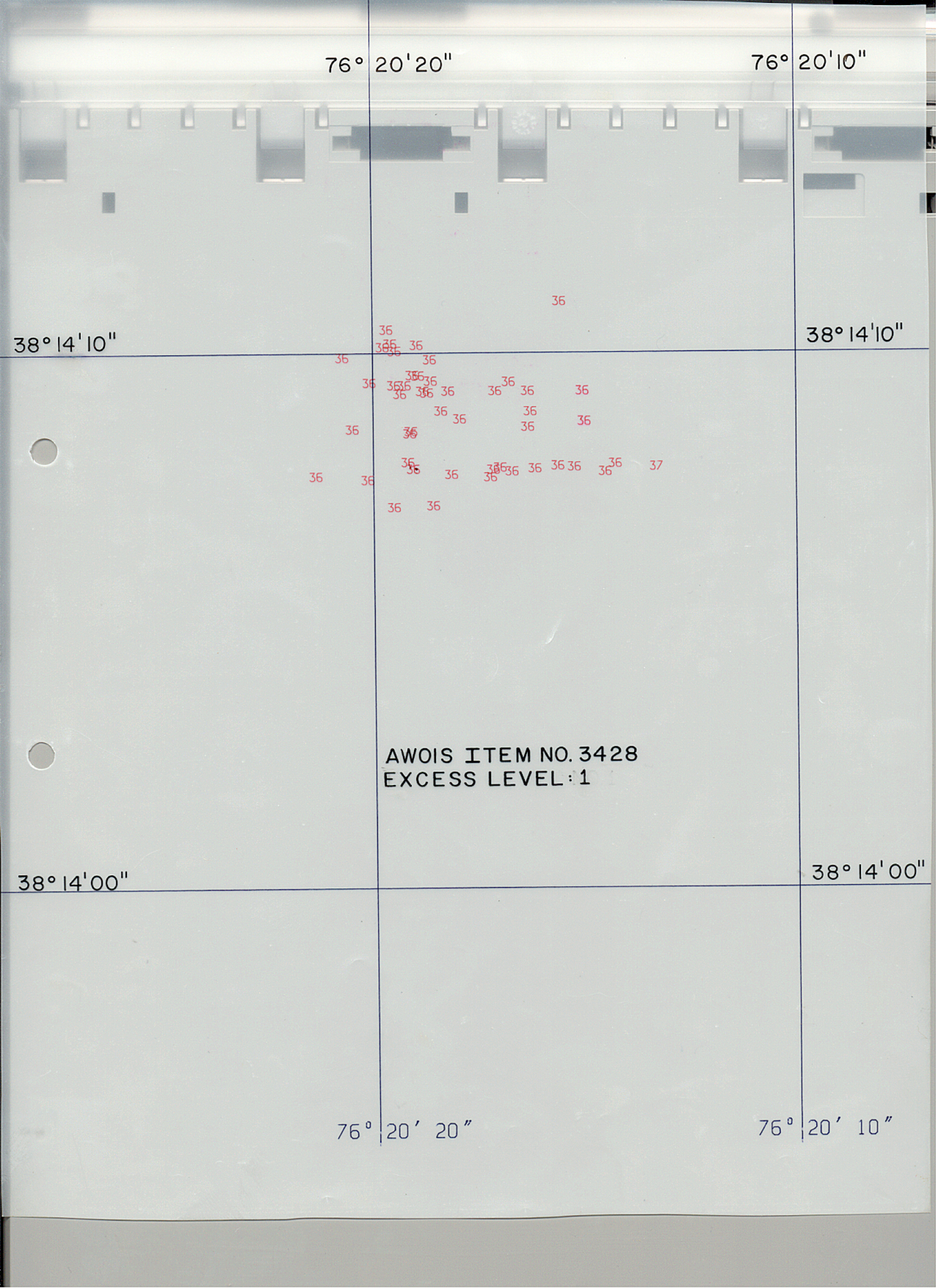
FE-267SS
AWOIS ITEM NO. 3428
POSITION OVERLAY

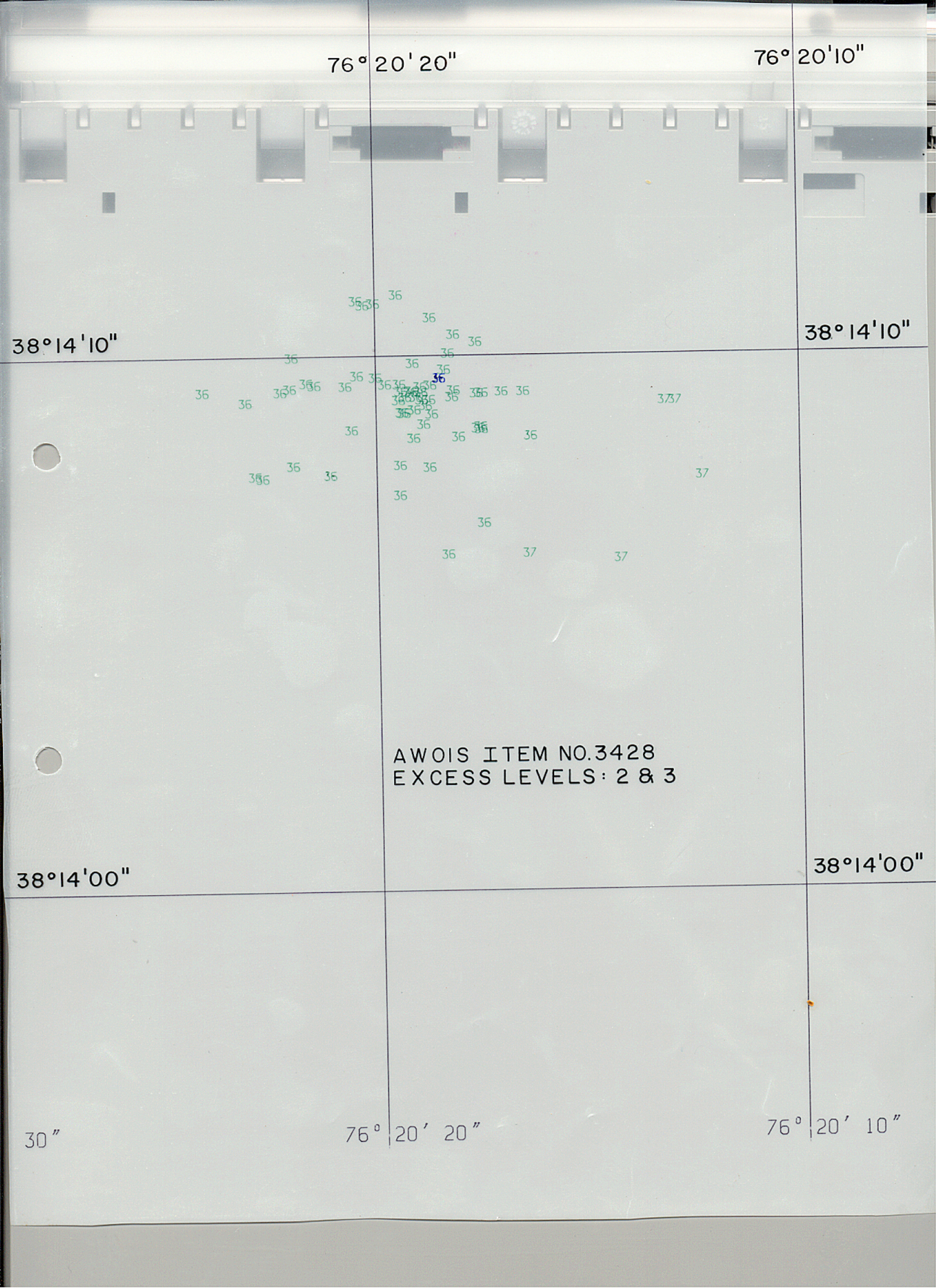
38° 14' 00"

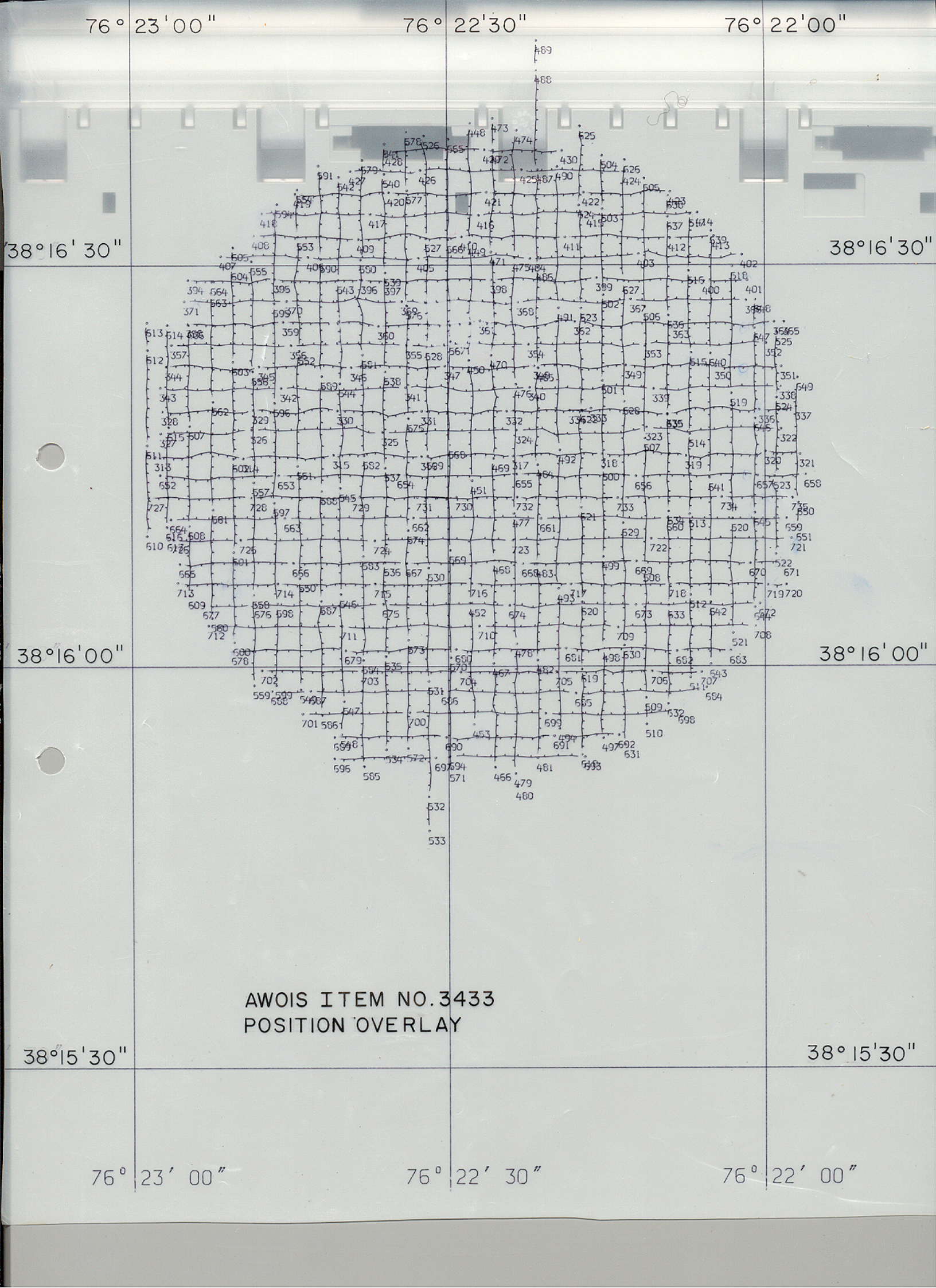
38° 14' 00"

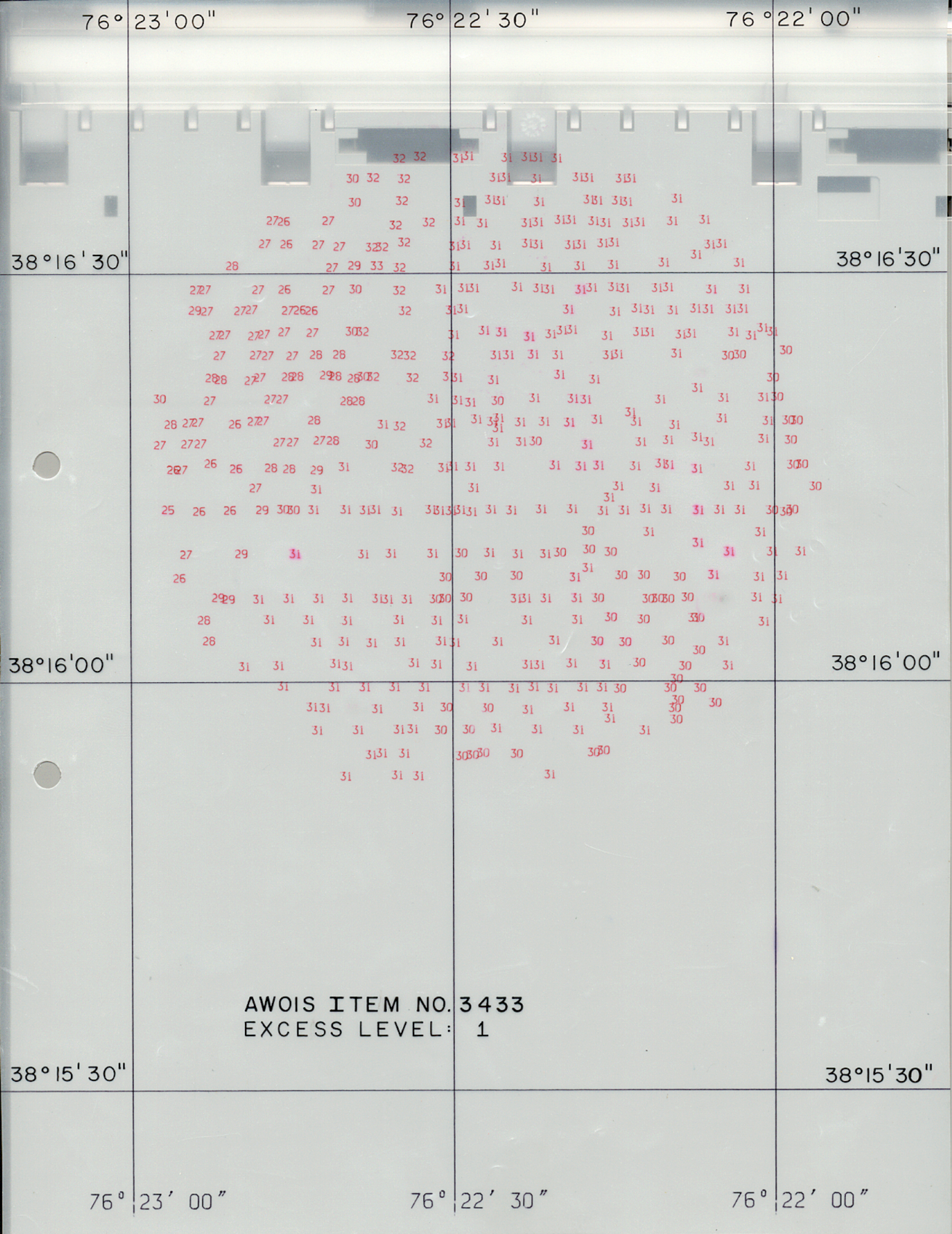
76° 20' 20"

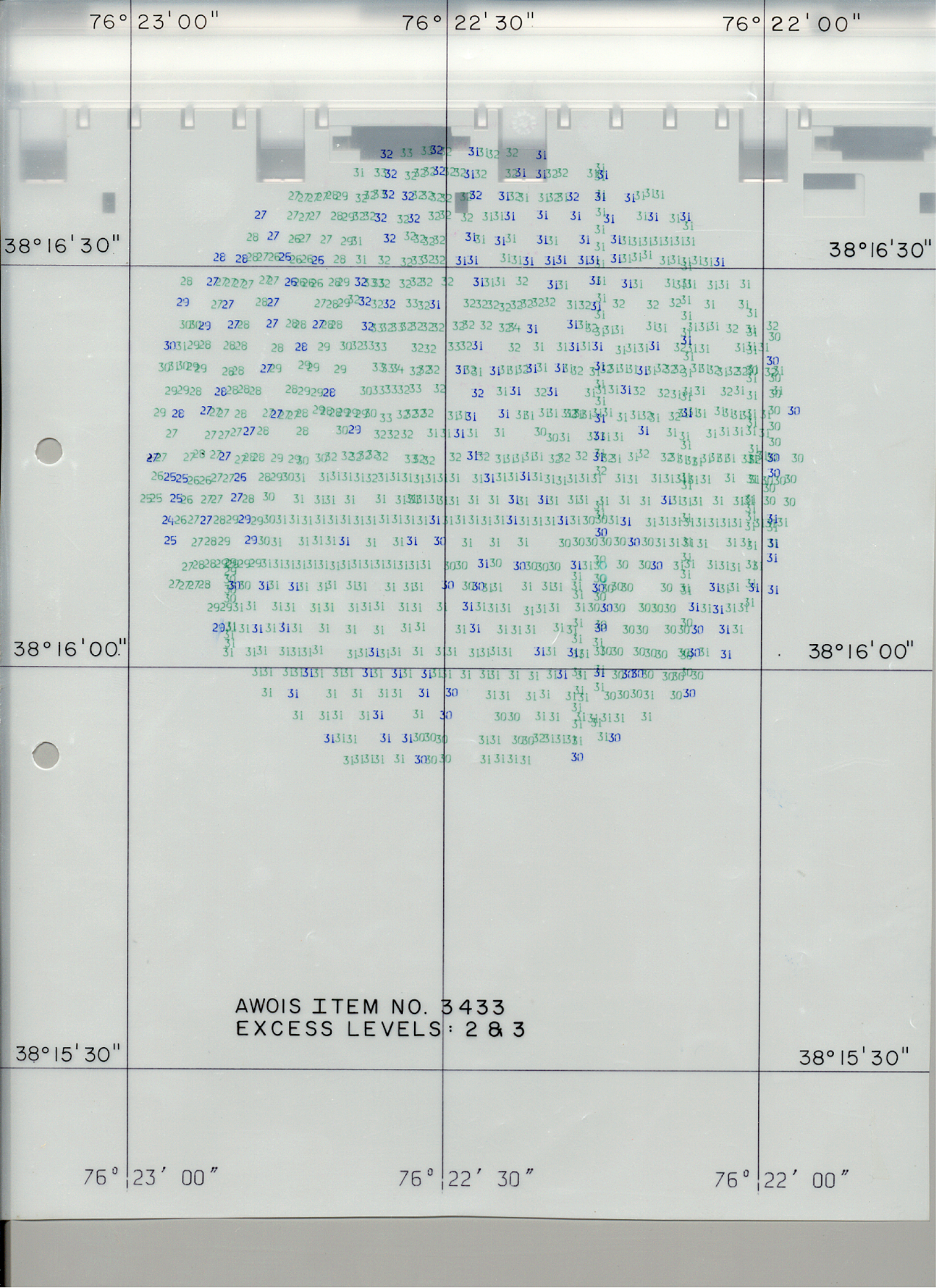
76° 20' 10"


76° 20'20"
76° 20'10"
38° 14'10"
38° 14'10"
36
AWOIS ITEM NO. 3428
EXCESS LEVEL: 1
38° 14'00"
38° 14'00"
76° 20' 20"
76° 20' 10"


76° 20' 20"
76° 20'10"
38°14'10"
38°14'10"
AWOIS ITEM NO.3428
EXCESS LEVELS: 2 & 3
38°14'00"
38°14'00"
30"
76° 20' 20"
76° 20' 10"


76° 23'00"
76° 22'30"
76° 22'00"
38°16'30"
38°16'00"
38°15'30"
AWOIS ITEM NO. 3433
POSITION OVERLAY


76° 23'00"
76° 22'30"
76° 22'00"
38°16'30"
38°16'00"
38°15'30"
AWOIS ITEM NO. 3433
EXCESS LEVEL: 1
76° 23' 00"
76° 22' 30"
76° 22' 00"


76° 23' 00"
76° 22' 30"
76° 22' 00"
38° 16' 30"
38° 16' 30"
38° 16' 00"
38° 16' 00"
AWOIS ITEM NO. 3433
EXCESS LEVELS: 2 & 3
38° 15' 30"
38° 15' 30"
76° 23' 00"
76° 22' 30"
76° 22' 00"