9587

Diag. Cht. NO. 901-2

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

(HYDROGRAPHIC)

Type of Survey HYDROGRAPHIC

Field No. MI-125-1-76

Office No. H-9587

LOCALITY

State PUERTO RICO

General Locality WEST COAST OF PUERTO RICO

Locality CANAL DE LA MONA

1976

CHIEF OF PARTY
Wesley V. Hull

LIBRARY & ARCHIVES

DATE 9/6/77

☆ U.S. GOV. PRINTING OFFICE: 1975—668-353

9587

Cola 3

Chart
25-671
25-640

FORM C&GS-537 (8-15-59)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

REGISTER NO.

H-9587

HYDROGRAPHIC TITLE SHEET

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

FIELD NO.

MI-125-1-76

State: PUERTO RICO

General locality: WEST COAST OF PUERTO RICO

Locality: ~~MONA PASSAGE~~ CANAL DE LA MONA

Scale: 1:125,000 Date of survey: 10 Feb 1976 to 3 Mar 1976

Instructions dated: 30 September 1975 Project No.: OPR-423-MI-76 MONA PASSAGE

Vessel: NOAA SHIP MT MITCHELL (MSS-22) VESNO 2220

Chief of party: CDR WESLEY V. HULL, NOAA

Surveyed by: See Remarks

Soundings taken by echo sounder, hand lead, pole: Echo Sounder

Graphic record scaled by: PWS, RW, DRR, JB, RM, EM, RS

Graphic record checked by: RW, PWS

Protracted by: N/A Automated plot by: Cal-Comp 618 ATLANTIC MARINE CENTER
Verified by R. R. Hill

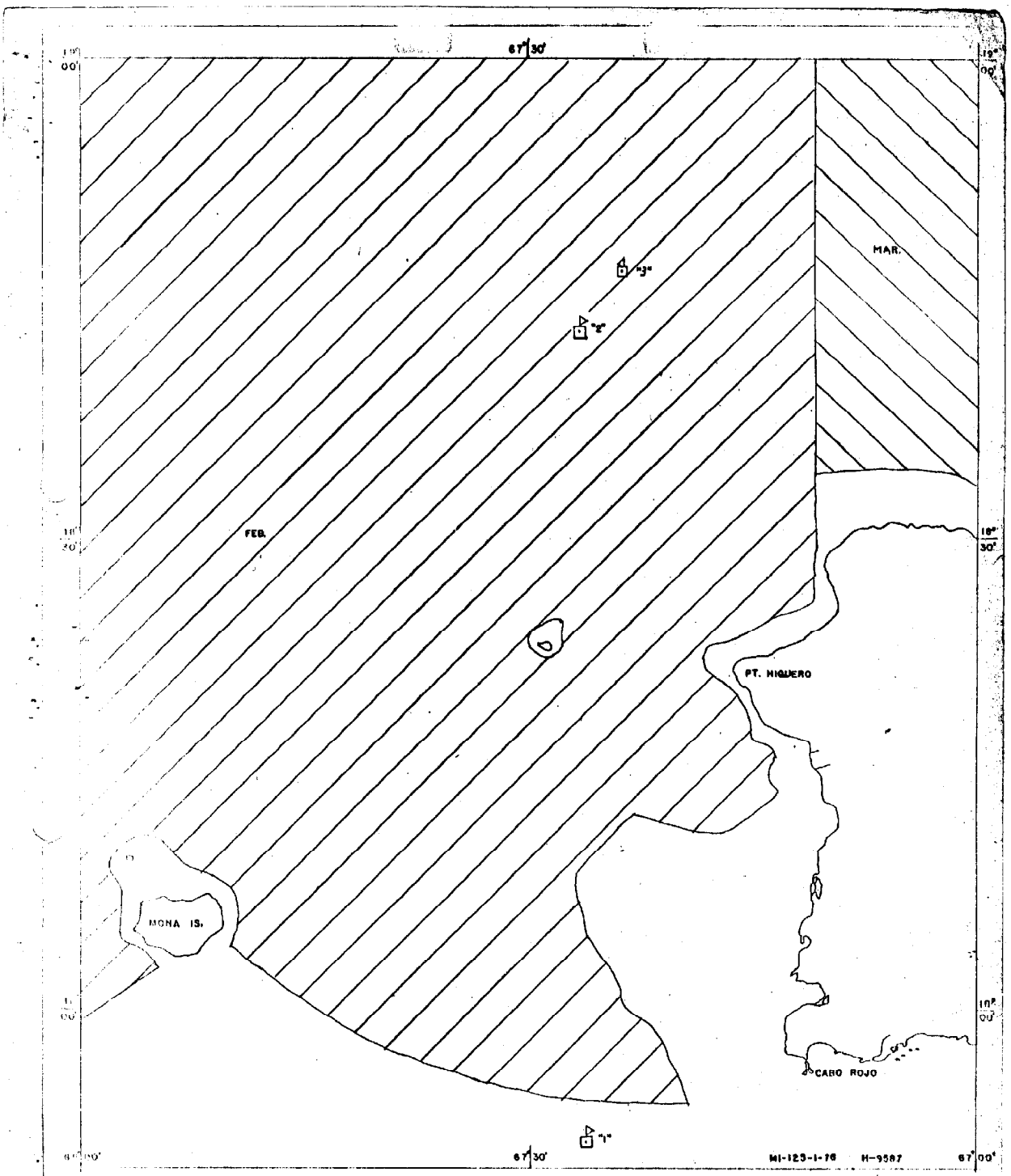
Soundings penciled by: N/A

Soundings in ~~fathoms feet~~ at MLW MLLW: Fathoms and tenths at MLW

REMARKS: LCDR W. DANIELS, LT A. POTOK, LTJG R. MARRINER, LTJG S. IWAMOTO
ENS R. MANN, ENS D. TERRY, ENS N. KONCHUBA, ENS W. DEWHURST,
ENS D. RICE, ENS J. BAILEY

Applied to stds 3/9/78

USCOMM-DC 19086-P65



PROGRESS SKETCH
OPR 423-MI-76
PUERTO RICO
HYDROGRAPHIC OPERATIONS
FEB.-MAR, 1976
NOAA SHIP MT. MITCHELL MSS-22
WESLEY V. HULL, CDR, NOAA, COM'D'G
SCALE OF CHART 25640

FEB.	MAR.
3,083	483
2,647	273
2	1
25	5

LEGEND
L.N.M. SOUNDING LINE "SHIP"
SQ.N.M. SOUNDING LINE "SHIP"
NANSEN CASTS "SERIAL-TEMP"
BOTTOM SAMPLES "GRAB"

TABLE OF CONTENTS

HYDROGRAPHIC TITLE SHEET
PROGRESS SKETCH

✓= Items removed from the D.R and filed with the field records.

DESCRIPTIVE REPORT

TO

ACCOMPANY

HYDROGRAPHIC SURVEY H-9587

(FIELD NO MI-125-1-76)

1:125,000 1976

NOAA SHIP MT MITCHELL MSS-22

WESLEY V. HULL
COMMANDER, NOAA
COMMANDING OFFICER

A. Project

This survey was carried out in accordance with project instructions OPR-423-MI-76-MONA PASSAGE, issued 30 September 1975 and as amended by changes 1, 2, and 3 dated 15 October 1975, 9 December 1975, and 20 January 1976 respectively.

B. Area Surveyed

This survey covered an area offshore west of Puerto Rico and around Mona Island from the 100 fathom contour seaward. The survey area is described approximately by the following point connected clockwise, and where possible, following the 100 fathom contour.

Lat.	17°53,0'N	Long.	67°18.5'W
	17°57.0'N		68°00.0'W
	19°01.0'N		68°00.0'W
	19°01.0'N		67°00.0'W

Survey operations were conducted between 10 Feb 1976 and 3 Mar 1976.

C. Sounding Vessel

The NOAA Ship Mt Mitchell (MSS-22, VESN 2220) was used to obtain all soundings for this survey.

D. Sounding Equipment and Corrections to Echo Sounding

The following sounding equipment was used to obtain depth information for this survey.

Ross Model 5000 Fine-line Depth Sounder S/N 1050
Ross Model 4000 Recorder S/N 1050
Digitizer S/N 1039-2
Transceiver S/N 1050
Raytheon UGR-196 Recorder S/N 170
Edo 248C Transceiver S/N 516
Raytheon CESP-I Signal Correlator S/N 016
Digitrak Model 261C Digitizer S/N 202

The Ross depth sounder was used to record soundings less than 200 fathoms. The Raytheon UGR was used to record soundings greather than 200 fathoms. For comparison, both units were run simultaneously before switching from one to the other.

The digitizing feature of the UGR depth sounder was used during on line operations except when seas were so rough as to cause it to stop tracking. During these periods, depths were scaled on line and entered manually on the Hydroplot controller. Missed soundings and miss-digitized soundings were determined during off-line scanning and applied using the Hydroplot corrector tape.

When the CESP unit (a signal correlator for deep water sounding) was used, a TRA corrector of -23.8 fathoms was used. This corrector is the sum of 26.0 fathoms caused by a 65 msec. delay associated with

the CESP operation and the 2.2 fathom draft of the sounding vessel.

Variations in initial and phase were checked regularly and adjusted on the depth sounder. Uncorrected phase shifts or initial errors were determined and corrected during off-line scanning.

Settlement and squat corrections were added to draft changes with the resultant depth correctors used to make a TC/TI tape. Only where this corrector was greater than one half of one percent of the shallowest depth was a corrector applied. Data plotted on the field sheets do not include this correction.

Velocity of sound through water correctors were applied to soundings using the Hydroplot velocity tape. These corrections were determined using the Hydroplot program RK530 with temperature and salinity data obtained from Nansen Casts in both shoal and deep water. Results from each Nansen Cast were averaged to determine the final corrections. Nansen Casts were taken at the following locations:

Nansen Cast #1	10 February 1976	Lat. 17°51.3'N	Long. 67°26.4'W
Nansen Cast #2	17 February 1976	Lat. 18°43.5'N	Long. 67°26.5'N
Nansen Cast #3	1 March 1976	Lat. 18°47.0'N	Long. 67°24.6'W

The following instruments were used to analyze the temperature and salinity from the Nansen Casts:

Protected Reversing Thermometer Serial Number:	Last Calibration or Check:
2995	February 1973
7687	February 1973
12973	2 January 1974
12974	February 1973
12977	February 1973
12982	2 January 1974
13008	February 1973
13010	February 1973
13050	February 1973
13261	2 January 1974
13263	2 January 1974
13267	2 January 1974
13300	25 February 1974
13306	February 1973
13310	2 January 1974
13315	25 February 1974
13321	2 January 1974
13326	February 1973
17266	February 1973
18567	February 1973
19543	1 February 1973
58865	2 January 1973

Unprotected Thermometers Serial Numbers:	Last Check or Calibrate:
15468	February 1973
53915	February 1973
57865	February 1973
612683	February 1973
612863	February 1973
623117	February 1973

Salinometer: Beckman Instruments RS-C Portable Induction Salinometer Serial No. 24653 Calibrated at factory Jan 1976.

E. Hydrographic Sheets

Field sheets for this survey were prepared using Hydroplot systems aboard the NOAA Ship Mt Mitchell MSS-22 and Launch #1004 (MI6). Field records will be forwarded to the Atlantic Marine Center for verification and processing.

Soundings on field sheets are corrected for draft, initial error, digitizing error, and velocity of sound corrections. They are not corrected for tides, settlement and squat and draft changes.

F. Control Stations

Electronic Position control stations used for the survey are:

Signal:	Name:	Lat:	Lat:
008	Mayaguez Harbor Light	18°12'36.279"	67°09'30.142"
009	Rojo Del Norte	17°56'06.256"	67°11'36.454"
010	Rojo Raydist 1974	17°56'06.256"	67°11'36.454"
020	Mona	18°07'23.511"	67°51'41.118"
021	Mona Del Norte	18°07'23.511"	67°51'41.118"
030	10-75 Arecibo Raydist	18°29'02.024"	66°42'02.527"
031	10-75 Arecibo Del Norte	18°29'02.024"	66°42'02.527"
037	Higuero Lt Del Norte	18°21'50.244"	67°16'16.268"
039	Higueros Del Norte	18°21'49.829"	67°16'17.369"
040	9A-75 Higueros Raydist 1976	18°21'49.829"	67°16'17.369"
101	Pt Higueros Lighthouse ?	18°21'50.300"	67°16'16.249"

All stations were geodetic third order positions provided by Operations Division, Atlantic Marine Center. Stations were erected by ship's personnel and U.S. Navy NAVAIDS Support teams.

G. Hydrographic Position Control

The Raydist and Del Norte range-range navigation systems were used for position control during the Survey.

The following equipment was used:

Ship Board		S/N:	Dates Used:
Raydist frequency	3292.400		
Raydist Navigator ZA-67B		097	2/12 - 3/3
Raydist Navigator ZA-67B		098	2/10 - 2/12
Raydist Transmitter TA-96		066	2/12 - 3/3
Raydist Transmitter TA-96		080	2/10 - 2/12
Raydist Power Supply SA-192		070	2/10 - 3/3
Navigation Interface		200587	2/10 - 3/3
Sawtooth Recorder		1907	2/10 - 3/3
Del Norte Trisponder 202A		159	2/10 - 3/3
Parrallel Buffer		122	2/10 - 3/3
Del Norte Master T/R Unit		277	2/10 - 2/14
Del Norte Master T/R Unit		263	2/14 - 3/3
Antenna		122	2/10 - 3/3

Mayaguez Harbor Light (008)	Unit:	S/N:
Del Norte Remote	D	247
Antenna		203

Rojo (009,010)

Del Norte Remote	D	251
Antenna		147
Raydist Transmit-Receiver		104
Raydist Transmit-Receiver		106

Mona (020,021

Del Norte Remote	D	251
Antenna		147
Raydist Transmit-Receiver		104
Raydist Transmit-Receiver		106

Arecibo (030,031)

Del Norte Remote	B	217
Antenna		141
Raydist Transmit-Receiver		103
Raydist Transmit-Receiver		105

Higueros Lt (037)

Del Norte Remote	B	217
Antenna		141

Higueros (039,040)	Unit:	S/N:
Del Norte Remote	B	217
Del Norte Remote	D	247
Antenna		141
Antenna		203
Raydist Transmit-Receiver		103
Raydist Transmit-Receiver		105

Higueros Light House (101)		
Del Norte Remote	D	247
Antenna		203

Calibration of the Electronic Control System

Calibration of the Del Norte and Raydist Navigation Systems was accomplished using three point fixes and comparing observed range-range values with computed values. An independent check fix was taken simultaneously with each calibration. Fixes were taken on both starboard and port sides of the ship to minimize the error caused by distance to antenna.

Lane jumps in the Raydist system were detected by on line scanning of the sawtooth record and confirmed by comparison with Del Norte range values when available. Also, while both systems were operating, two comparisons were made per watch between Del Norte and Raydist.

During periods when Raydist was not functioning, Del Norte was used for positioning control. Once Raydist was functioning again, Del Norte was used to obtain a whole lane count of the Raydist system. The conversion factor of 45.509 meters per Raydist lane was used. The use of Del Norte for position control and calibration eliminated much down time and dead heading to reach a landfall where calibration could be accomplished.

Partial lane correctors were not averaged between consecutive calibrations as the result of such averaging would affect the positioning of soundings by less than 0.1 mm on the scale of the survey.

H. Shore Line

There was no shore line within the limits of this survey.

I. Cross Lines

Cross lines were run at 90° to main scheme where operational requirements would allow. Otherwise, they were run according to the Hydro Manual.

Cross lines compromise 21% of main scheme where soundings exceeded 500 fathoms and 10% of main scheme where soundings are less than 500 fathoms as per project instructions.

Agreement between cross lines and main scheme was good with all discrepancies of less than two fathoms and generally less than one fathom.

J. Junctions

This Survey Junctioned with the following contemporary surveys:

Reg No:	Scale:	Date:
H9463	1:125,000	1975
U.S. Navy 755001	1:25000 to 1:150000	1975
U.S. Navy 745025	1:10,000	1975

Agreement with the 1975 Whiting Survey (H9463), which junctioned on the southern limits of the survey, was generally good with disagreements occuring only in areas of steep slope and irregular bottom configuration.

Agreement with the Navy surveys ranged from good at shallow depths along the western limits of the survey to fair and poor along the northern limits where the bottom was characterized by steep slopes at depth over 2600 fathoms. The Navy survey did not include velocity of sound in water corrections which would account for many of the disrepancies. Also, transfer from the Navy surveys was difficult due to the differences in scale and the number of soundings present on the Navy survey.

K. Comparison with Prior Surveys

The following prior surveys were compared with this survey:

Prior Survey Registry No:	Scale:	Date:
H 2676	1:60,000	1904
H 3004	1:20,000	1909
H 3005	1:100,000	1909

Randomly selected soundings from these prior surveys plotted in agreement with this survey.

The following numbered pre-survey review items were investigated during this survey:

1. The 55 and 45 fathom soundings at approximately 18°36.0'N Latitude 67°10.5'W Longtitude and 18°35.5'N Latitude 67°8.5'W

Longitude were not found. There is no indication of shoaling in that area as shown by positions 2026 through 2052 although a shoal does exist south of the locations. These soundings should not be charted. Concur RDS

2. The 5, 15, 69, 44, and 16 fathom soundings at approximately 18°14.45N lat 67°32'W Long are located around a shoal where the most shoal soundings were 58 fathoms at 18°14.45N Lat 67°34.3W Long and 44 fathoms at 18°13.8N Lat 67°32.4W Long. These soundings represent the 5th sounding after position 469 and the 4th sounding after position 814 respectively. The 5, 16, and 15 fathom soundings were not found. ~~Only the shoal soundings made by this survey should be charted.~~ ✓ See Verifier's Report.

3. The 46, 60, 62, and 66 fathom soundings at approximately 18°23.5N Lat 67°25'W Long are located in the area of a shoal where the most shoal sounding was found to be 62~~3~~ fathoms located at 18°23.4'N Lat 67°24.5'W Long which was the first sounding after position 1969. The 62~~3~~ fathom sounding reported by this survey should be charted. ✓ ~~Concur~~ RDS [See Verif. Rpt section 7a (PSI 3A)]

4. The 38 fathom sounding at approximately 18°34.5'N Lat 67°13' Long was not found and no indication of shoaling was found in this area. This sounding should not be charted (See Verifier's Report - section 7) Concur RDS.

5. The 10 fathom sounding reported in 1975 at approximately 18°25.'N Lat 67°40'W Long was not found as evidenced by positions 1570 through 1594 and should not be charted. ✓ See Verifier's Report.

6. The three soundings of 226, 191, and 282 reported in 1968 along a line between approximately 18°30'N Lat 67°47'W Long and 18°21.9N Lat 67°57'W Long were found to be part of the general shoaling to the nortwest of this line. The 191 fathom sounding is most significant in that it is part of a ridge running NW to SE accross this area. The~~se~~ soundings should be charted to delineate the bottom in this area. ^present survey RDS.

7. and 8. The 131 fathoms reported at approximately 18°24'N Lat 67°~~57~~45.4'W Long and the 123 fathoms reported at 18°23'N Lat 67°~~46.5~~43.8'W Long are located in the area of a shoal where the most shoal sounding was 127 fathoms at 18°22.5'N Lat 67°45.35'W Long which occured at position 1547. This shoal area should be charted as shown by this survey. Concur RDS

9. As shown by soundings from positions 1400 to 1402 and position 1518 to 1523, the 15 fathom shoal soundings at approximately 18°20'N Lat 67°48.5'W Long does not exist and should not be charted. ✓ See Verifier's Report.

10. The 171 fathom sounding reported in 1973 at approximately 18°18'N Lat 67°43.5'W Long is part of a shoal ~~whose most shoal sounding was 180 fathoms. This occured at 18°15.7'N Lat and 67°39.6'W Long which is position 840.~~ shown on the present survey. The 171 fathoms sounding is part of the general ~~trend and represents not drastic~~ bottom configuration. Soundings in this area should be charted according to this survey to delineate the bottom. Concur RDS.

11. The 125 fathoms reported in 1973 at approximately 18°15'N Lat 67°41'W Long is located in the same area as the shoal described in Item 10 and should be charted as needed to delineate the bottom. Concur RDS
Reported 125 fathoms is approximately 1500 meters from Southwest from shallow foreline on present survey. Present survey depths should be charted.

12. The line of soundings of 250, 192, 200, 190 and 150 fathoms reported in 1973 at approximately 18°08'N Lat 67°41'W Long are in the area of a shoal whose most shoal depth was found to be 144 fathoms. This sounding was the first after position 536. The row of soundings comprised of 222, 224, and 222 reported in 1962 at approximate 18°02'N Lat 67°40'W Long were not found as evidenced by positions 1532 through 1544. The 144 fathom sounding from this survey should be charted. Present survey is adequate to delineate the bottom configuration. The 222, 224, and 222 fathom reported depths in 1962 should be considered disproved.
(Accuracy questionable - disregard in favor of present

13. The 11 fathom sounding at approximately 18°13'N Lat 67°26'W Long was found at position 814 and is located at 18°13.7'N Lat 67°25.8'W Long and should be charted. Concur RDS, HIT

14. The 90 fathom sounding at 18°54.5'N Lat 67°28'W Long does not exist as shown by soundings from position 275 through 401. This sounding should not be charted. Concur RDS, HIT.

L. Comparison With Chart

Random soundings were taken from the following chart of the area:

Chart No:	Edition:	Date:	Scale:
25671	13th	3 May 1975	1:100,000

Generally these soundings plotted in agreement with the survey except as indicated in the presurvey review items and the following: The 30 fathom sounding at approximately 18°33.5N Lat 67°12,5W Long was not found. The most shoal sounding in the area was 34 fathoms at 18°34.0'N Lat 67°13.2W Long which was the 2nd and 3rd sounding from position 1884.

The 640 fathom sounding at 18°34.4'N Lat and 67°22.2'W Long was not found and no indication of shoaling occured in this area.

M. Adequacy of Survey

This survey is considered complete and adequate to supersede prior surveys for charting.

N. Aids to Navigation

There were no Floating aids to Navigation within the survey limits.

O. Statistics

Total Number of Positions	- 2194
Total Nautical Miles of Sounding Excluding Crosslines Development and Rejected Soundings	- 2247
Total Nautical Miles of Crosslines	- 395

Statistics (Cont)

Total Nautical Miles of Development	- 623
Total Square Miles of Hydrography	- 3400
Number of Temperature and Salinity Stations	- 3
Total Number of Bottom Samples	- 30

P. Miscellaneous

On sheet 3 of this survey, the survey party could not obtain soundings in an area approximately 9 miles long between 18°41'00"N and 18°50'00"N Latitude at 67°23'00" Longtitude. This was due probably to a very steep slope as shown by the soundings on either side.

Q. Recommendations

None

R. Automated Data Processing

The following Hydroplot programs were used for processing the data for this survey:

Program:	Name:	Version Date:
RK111	Range-Range Real Time System	8-7-74
RK201	Grid Signal Latice Plot	4-18-75
RK211	Range-Range Non-Real Time System	8-16-74
AM300	Utility Computations	5-22-75
RK530	Velocity Corrections	6-25-74
RK561	Geodetic Calibration	2-19-75
AM602	Elinore	5-21-75

Respectfully Submitted:

Donald R. Rice

DONALD R. RICE
ENSIGN, NOAA

Geographic Names List

The investigation of geographic names was not required for this survey.

SIGNAL NAMES LIST

008 MAYAGUEZ HARBOR LIGHT ------ Raydist station ----Q180672 1041 Δ
009 ROJO DELNORTE ----} SAME G.P. ----FIELD RECORDS ○
010 ROJO RAYDIST 1974 } ----FIELD RECORDS ○
020 MONA ----Q180673 1006 Δ
021 MONA DELNORTE ----Q180673 1006 Δ
030 10-75 ARECIBO RAYDIST --- off sheet ----FIELD RECORDS ○
031 ~~10-75 ARECIBO DELNORTE ----FIELD RECORDS~~
037 HIGUERO ~~LT~~ DELNORTE ----Q180672 1021 Δ
039 HIGUEROS DELNORTE ----} SAME G.P. ----FIELD RECORDS ○
040 9A-75 HIGUEROS RAYDIST 1976 ----FIELD RECORDS ○
079 CABO ROJO TV STATION WIPM TOWER ---- NP ----Q180672 1063
081 MAYAGUEZ RADIO STATION WAEL WEST MAST- NP ----Q180672 1052
083 MAYAGUEZ PUBLIC HOSPITAL WATER TANK ---- NP ----Q180672 1053
085 MAYAGUEZ RADIO STATION WKJB MAST ---- NP ----Q180672 1047
089 AIRPORT BEACON MAYAGUEZ AIRPORT ---- NP ----Q180672 1037
091 CENTRAL IGUALDAD 2 USGS ---- NP ----Q180672 1038A
093 RINCON TV STATION WOLE MAST ---- NP ----Q180672 1028
101 POINT HIGUERO LIGHTHOUSE ----Q180672 1022 Δ
103 TALL NAVY TOWER S. OF AGUADILLA ---- NP ----FIELD RECORDS
105 OBSTRUCTION LT ON NW CORNER OF AGUADILLA HOSP NP FIELD RECORDS
106 RAMEY AFB WATER TANK ---- NP ----Q180672 1004
107 POINT BORINQUEN LIGHTHOUSE ---- NP ----Q180672 1002
108 RAMEY AFB WATER TANK ---- NP ----Q180672 1004
109 MONA ISLAND LIGHTHOUSE ----Q180673 1002 Δ
110 NEW LIGHT ON MONA ISLAND - Plotted on NAV. AID ----FIELD RECORDS ○ *
111 CABO ROJO LIGHTHOUSE ----Q170671 1006 Δ

* See form 76-182 this report

APPROVAL SHEET

MI 125-1-76

H9587

The field work on this hydrographic survey was under my daily supervision. The boatsheet and records have been reviewed and approved by me.

Wesley V. Hull
Commander, NOAA
Commanding

8/10/76

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Atlantic Marine Center:

Hourly heights are approved for

Tide Station Used (NOAA Form 77-12): Mayaguez
Aguadilla

Period: February 10 - March 3, 1976

HYDROGRAPHIC SHEET: H-9587

OPR: 423

Locality: Mona Passage, Puerto Rico

Plane of reference (mean ~~low~~ low water): 3.22 ft. - Mayaguez
3.39 ft. - Aguadilla

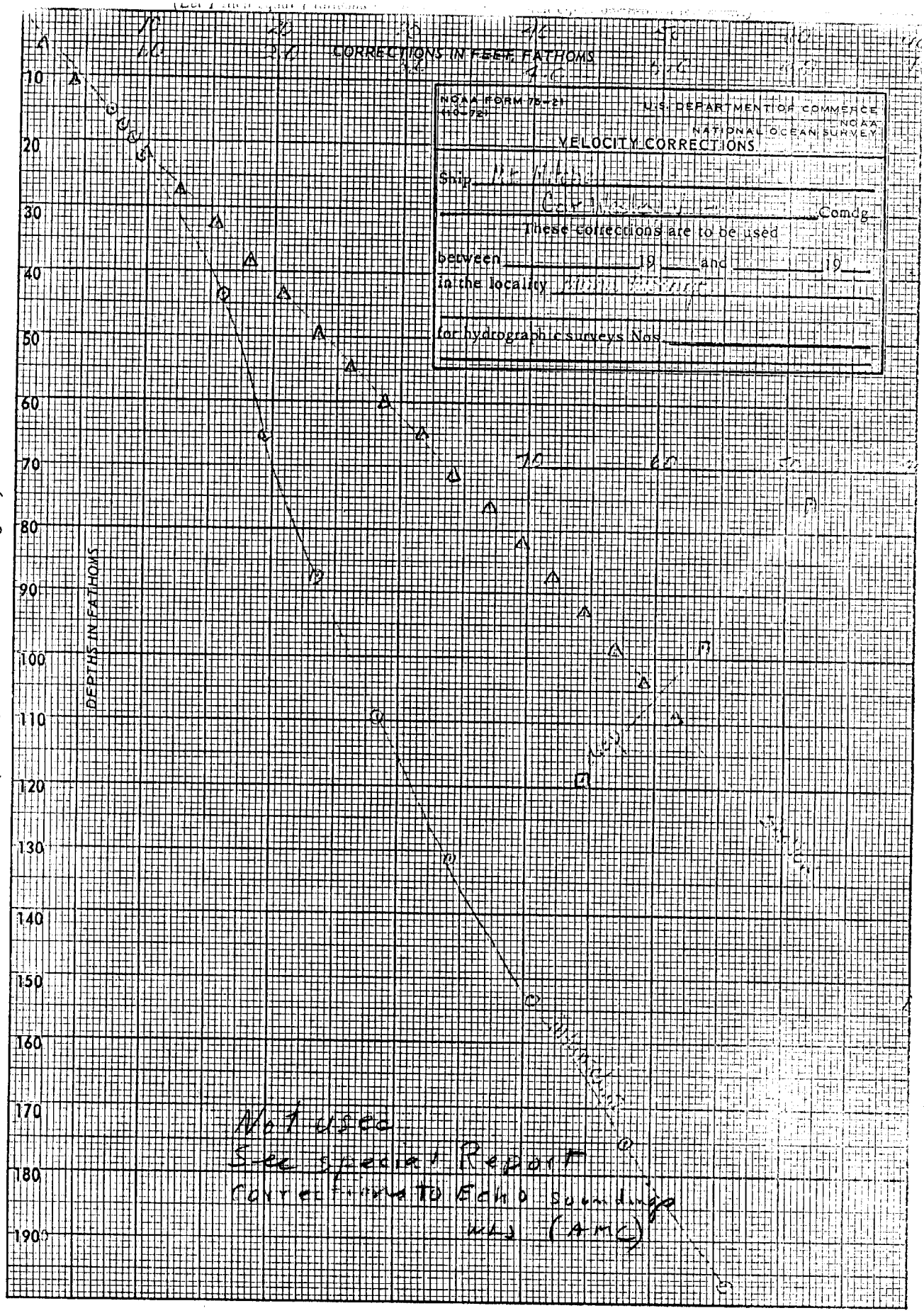
Height of Mean High Water above Plane of Reference:
1.1 ft.

Remarks: Recommended zoning (where tide reducers are required):

(1) North of 18°22' zone direct on Aguadilla

(2) South of 18°22' zone direct on Mayaguez

James R Hubbard
for Chief, Tides Branch



True Depth
(For deep water add a 0 to these figures)

K+E 20 X 20 TO THE INCH 46 1240
7 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

NOAA FORM 76-155
(11-72)

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

SURVEY NUMBER

H-9587

GEOGRAPHIC NAMES

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	
CABO ROJO										1
CANAL DE LA MONA										2
ISLA DE MONA										3
ISLA DESECHEO										4
ISLA MONITA										5
PUERTO RICO										6
PUNTA ARENAS										7
PUNTA BORINQUEN										8
PUNTA HIGUERO										9
PUNTA SARDINA										10
										11
										12
										13
										14
										15
										16
										17
					APPROVED					18
					Chas. E. Harrington					19
					STAFF GEOGRAPHER J-C5142					20
					5 Oct. 1977					21
										22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

U.S. G.P.O. 1972-769-565/516 REG.#6

VELOCITY CORRECTOR TAPE PRINTOUT

Comp by WLJ
by W.Hill

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000025 0 0001 0001 001 220000 125176
000050 0 0002
000076 0 0003
000100 0 0004
000121 0 0005
000142 0 0006
000163 0 0007
000182 0 0008
000201 0 0009
000222 0 0010
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007000 0 0200
008070 0 0220
009000 0 0240
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010700 0 0280
011600 0 0300
012470 0 0320
013200 0 0340
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015240 0 0400
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SIGNAL TAPE PRINTOUT

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010	7	17	56	06256	067	11	36454	250	0005	329240	✓	
020	7	18	07	23511	067	51	41118	250	0020	329240	✓	
021	7	18	07	23511	067	51	41118	250	0000	000000	–	
030	7	18	29	02024	066	42	02527	250	0000	329240	✓	
031	7	18	29	02024	066	42	02527	250	0000	000000		
–037	0	18	21	50244 ✓	067	16	16268 ✓	250	0027	000000	✓ HIGUERO 1021 Δ	on Pt Hig Lt Ho catwalk
–039	0	18	21	49829	067	16	17369	250	0000	000000	✓	
–040	4	18	21	49829	067	16	17369	250	0000	329240	–	
079	7	18	04	11913	067	08	03099	139	0000	000000	–	
081	6	18	10	37857	067	10	17502	139	0000	000000	–	
083	4	18	11	03828	067	09	08182	139	0000	000000	–	
085	6	18	11	21332	067	09	43063	139	0000	000000	✓	
089	7	18	15	21231	067	09	01533	139	0000	000000	–	
091	4	18	16	27978	067	09	27819	139	0000	000000	–	
093	1	18	18	51229	067	11	29947	139	0000	000000	–	
–101	7	18	21	50300 ✓	067	16	16249 ✓	139	0000	000000	✓ Lt Ho 1022 Δ	50' high
103	7	18	24	02658	067	10	40080	139	0000	000000	–	1.79 meters
105	7	18	26	40124	067	09	05556	139	0000	000000	–	NNE of sta
106	7	18	29	53620	067	08	40298	139	0000	000000	–	HIGUERO
107	7	18	29	57045	067	08	56914	139	0000	000000	–	
108	7	18	29	53620	067	08	40298	139	0020	000000	–	
109	7	18	05	17728	067	50	48728	139	0000	000000	Δ ✓	
110	7	18	06	41110	067	54	30480	~~139~~ 250	0000	000000	–	
111	7	17	56	08035	067	11	33367	139	0000	000000	✓	

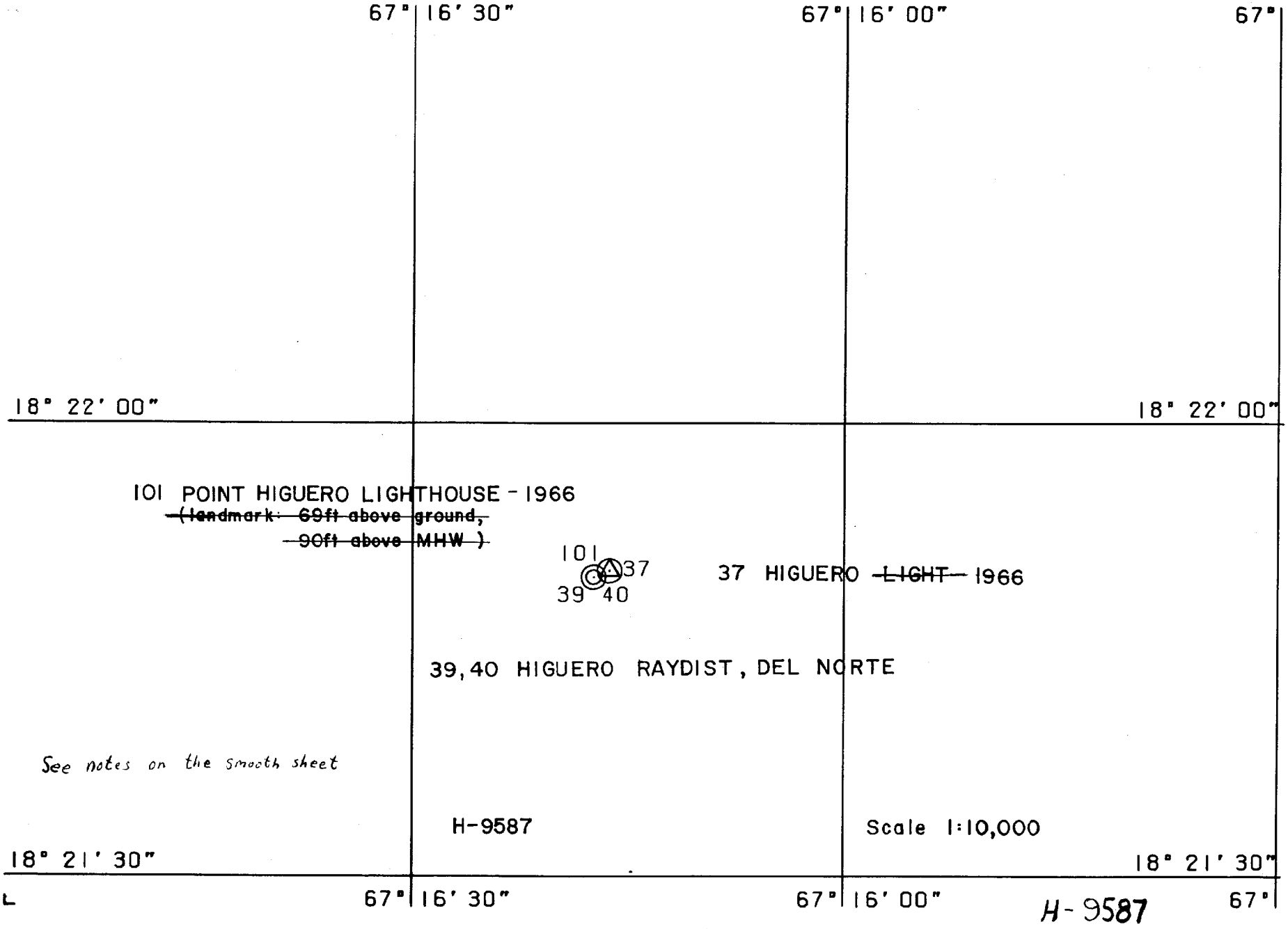
175000 680500

192000 665500

101
37
39
40 } 1

008 ✓

111
009
010
020
109


67° 16' 30"
67° 16' 00"
67°
18° 22' 00"
18° 22' 00"
101 POINT HIGUERO LIGHTHOUSE - 1966
~~(landmark: 69ft above ground, 90ft above MHW)~~
101
37
39
40
37 HIGUERO ~~LIGHT~~ 1966
39,40 HIGUERO RAYDIST, DEL NORTE
See notes on the smooth sheet
H-9587
Scale 1:10,000
18° 21' 30"
18° 21' 30"
67° 16' 30"
67° 16' 00"
67°

H-9587

APPROVAL SHEET
FOR
SURVEY H-9587

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

B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Provisional Hydrographic Manual. Exceptions are listed in the Verifier's Report.

Date: August 5, 1977

Signed: William L Jones

Title: Chief, Verification Branch

NOAA FORM 77-27 (5-77) | U. S. DEPARTMENT OF COMMERCE NOAA | HYDROGRAPHIC SURVEY NUMBER

HYDROGRAPHIC SURVEY STATISTICS

H-9587

RECORDS ACCOMPANYING SURVEY: To be completed when survey is registered.

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	BOAT SHEETS & PRELIMINARY OVERLAYS	8 7 2
DESCRIPTIVE REPORT	1	SMOOTH OVERLAYS: POS. ARC, EXCESS	3

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
~~Accor.~~ ENVELOPES	19-PDR		smooth 1			1
CAHIERS	1		with depth 1			
VOLUMES	2					
BOXES			2			1- Sawtooth records

T-SHEET PRINTS (List)

SPECIAL REPORTS (List)

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS: PRE-VERIFICATION	AMOUNTS: VERIFICATION	AMOUNTS: TOTALS
POSITIONS ON SHEET			2194
POSITIONS CHECKED		110	
POSITIONS REVISED		50	
SOUNDINGS REVISED		40	
SOUNDINGS ERRONEOUSLY SPACED		0	
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED		0	
	TIME – HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)	6	2	
VERIFICATION OF CONTROL		8	
VERIFICATION OF POSITIONS		24	
VERIFICATION OF SOUNDINGS		24	
COMPILATION OF SMOOTH SHEET		16	
APPLICATION OF TOPOGRAPHY		2	
APPLICATION OF PHOTOBATHYMETRY			
JUNCTIONS		24	
COMPARISON WITH PRIOR SURVEYS & CHARTS		24	
VERIFIER'S REPORT		8	
OTHER		118	
TOTALS		250	

Pre-Verification by D. V. Mason	*Beginning Date* 05/24/76	*Ending Date* 05/24/76
Verification by D. V. Mason, R. R. Hill	*Beginning Date* 12/06/76	*Ending Date* 06/15/77
Verification Check by W. L. Jonns	*Time (Hours)* 07/1 12 7	*Date* 08/02/77
Marine Center Inspection by Hydrographic Inspection Team, AMC	*Time (Hours)* 25	*Date* 08/05/77
Quality Control Inspection by R. W. Wellman	*Time (Hours)* 61	*Date* 10-4-77
Requirements Evaluation by D. J. Hill	*Time (Hours)* 5	*Date* 2-15-78

D.R. Engle 13hrs 1-12-78

Reg. No. H-9587

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

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

CARDS CORRECTED

DATE _____ TIME REQ'D _____ INITIALS _____

REMARKS:

Reg. No. H-9587

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

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

MAGNETIC TAPE CORRECTED

DATE 5/6/82 TIME REQ'D. _____ INITIALS JHC

REMARKS:

H-9587

Items for Future Presurvey Reviews

Reference Section 7a of the Verifier's Report:

PSR item 3A, a reported 46-fathom depth falling on a feature of relatively small extent on the present survey, is not adequately disproved by the present survey and should be investigated further during future work in the area.

Position Index		Bottom Change	Use	Resurvey
Lat.	Long.	Index	Index	Cycle

Inasmuch as more than 99% of all depths on the present survey are greater than 20 fathoms, the survey cycle is considered to be 50 years.

ATLANTIC MARINE CENTER
VERIFIER'S REPORT

REGISTRY NO. H-9587 FIELD NO. MI-125-1-76

West Coast of Puerto Rico, Mona Passage

SURVEYED: February 10 through March 3, 1976

SCALE: 1:125,000 PROJECT NO.: OPR-423

SOUNDINGS: Ross Model 5,000 Fineline
Ross Model 4,000
Raytheon UGR-196

CONTROL: Raydist (Range-Range), Del-Norte (Range-Range)

Chief of Party ..... CDR W. Hull
Surveyed by ..... LCDR W. Daniels
..... LT A. Potok
..... LTJG R. Marriner
..... LTJG S. Iwamoto
..... ENS R. Mann
..... ENS D. Terry
..... ENS N. Konchuba
..... ENS W. Dewhurst
..... ENS D. Rice
..... ENS J. Bailey
Automated Plot by ..... Calcomp Plotter-618 (AMC)
Verified and Inked by ..... R. R. Hill
August 10, 1977

1. Introduction

No unusual problems were encountered during verification; however, electronic correctors of over 200 lanes were applied briefly on two days (055 and 059). This exceeds the normal amount of lane correctors carried while conducting hydrographic operations.

The projection parameters have been revised during verification. See the Descriptive Report for these revisions.

2. Control and Shoreline

a. The source of the control is adequately described in Sections F and G of the Descriptive Report.

b. The source of all shoreline on this Smooth Sheet was transferred in brown ink from Chart 25671, 13th Edition, for orientation purposes only.

3. Hydrography

a. Depths at crossings are in good agreement.

b. The standard depth curves ~~were~~ are adequately delineated.

c. The development of the bottom configuration and investigations for least depths are adequate; however, several areas where depths reported were significantly shoaler than the present survey would have been more conclusively investigated if the Raytheon UGR-196 was utilized instead of the Ross graphic recorder. For example: the 16 fathoms reported, in latitude 18°13.83' and longitude 67°31.83', was developed by the Ross with sounding lines of 100 to 300 meters. This is a relatively high frequency and narrow beam width echo sounder, as opposed to the wide beam and low frequency of the UGR. With the line spacing used, the UGR would have more adequately covered the bottom and provided any indication of lesser depths.

4. Condition of Survey

The Smooth Sheet and accompanying overlays, hydrographic records, and reports are adequate to conform to the requirements of the Provisional Hydrographic Manual, with the following exception:

Some Raydist corrections were incorrectly applied on the raw data tapes to Del-Norte control.

5. Junctions

This survey joins with surveys of the U.S. Navy on the west, north, and southeast. Junctions were not effected with those surveys; however, survey depths and bottom configuration are in harmony.

U.S. Navy 755001 (1975) to the west and north
U.S. Navy 745025 (1975) to the southeast

The Smooth Sheet for H-9463 (1975), which joins the present survey on the south, has been verified and forwarded to Rockville. A junction, utilizing a copy of this survey, has been made with the present survey; however, depth curves are not in complete harmony. This junction should be completed in Rockville, where both Smooth Sheets can be compared and adjustments made. (See Q.C. Report - item 3)

6. Comparison With Prior Surveys

H-2632 (1903) 1:80,000
H-2640 (1903) 1:40,000
H-2676 (1904) 1:60,000
H-2937 (1908) 1:20,000
H-2938 (1905) 1:20,000 < H-2938a (1908-09) 1:80,000
H-3004 (1909) 1:20,000
H-3005 (1909) 1:100,000

These surveys, taken together, cover the common area of the present survey south of latitude 18°35'. A comparison between the present survey and prior surveys reveals few changes in the general bottom configuration. However, the present survey shows more detail in the bottom topography, which was not disclosed by the sparse sounding lines on the prior surveys. (See Q.C. Report - item 7)

7. Comparison With Charts 25671, 13th Edition, May 3, 1975 and 25640, 23rd Edition, December 13, 1975

a. Hydrography

The majority of the charted hydrography below latitude 18°35' originates with the previously discussed prior surveys; however, the source could not be readily ascertained for the remaining depths. Also, the source of hydrography above latitude 18°35' is unknown. (See Q.C. Report - item 8)

The Presurvey Review Items listed for the present survey were investigated by the field and are adequately discussed in Sections K and L of the Descriptive Report, with the following exceptions:

PSI #1 - the 45 and 55 fathom reported depths, charted in latitude 18°35.5', longitude 67°08.5' and latitude 18°36.0', longitude 67°10.5' respectively, originating with Chart Letter 244 of 1950, were investigated by this survey. A development of the area reveals depths from 100 to 200 fathoms along a uniform slope. Therefore, the depths in the charted positions are considered disproved by the present survey.

PSI #2A - the five-fathom reported (PA) 1964, charted in latitude 18°15.8' and longitude 67°34.5', originating with Chart Letter 711 of 1964, was investigated by this survey. A development of 100 to 200 meter spacing reveals depths from 58.5 fathoms to over 100 fathoms. It is extremely doubtful that significantly lesser depths exist in the vicinity of this reported depth.

Therefore, it is recommended that present survey depths be charted in this area and the five-fathom reported depth be disregarded. ~~(The reported 5 fathoms depth is not supported by the present survey. Data is as charted.)~~ concur

PSI #2B - the 15-fathoms reported (PA), charted in latitude 18°15.4' and longitude 67°34.2', originating with Chart Letter 329 of 1964, was investigated by this survey. A development revealed depths of over ~~70~~ 100 fathoms at this location. It is extremely doubtful that significant lesser depths exist in the vicinity of this reported depth. Present survey depths should be charted and it is recommended that the 15-fathom reported depth be disregarded. ~~returned (Reported depths not considered supported)~~ concur

PSI #2C - the 69-fathoms reported (PA), 1965, charted in latitude 18°14.43' and longitude 67°34.6', originating with Chart Letter 1305 of 1965, was investigated by this survey. A development revealed the 69-fathoms to be consistent with present survey depths and a lesser depth of 58.5-fathoms was obtained. It is recommended that the reported 69-fathoms be disregarded and present survey depths be charted.

PSI #2D - the 44-fathoms reported, charted in latitude 18°13.2' and longitude 67°32.1', originating with Chart Letter 37 of 1938, was investigated by the present survey. Comparable depths were found approximately 1500 meters north of the charted depth. * It is recommended that the reported 44-fathoms be disregarded and present survey depths be charted.

PSI #2E - the 16-fathoms reported, charted in latitude 18°13.83' and longitude 67°31.83', originating with Notice to Mariners No. 44 of 1947, was investigated by the present survey. This area was developed by approximately 100 to 300 meter sounding lines using the Ross depth recorder. A least depth of 44.5-fathoms was obtained on a shoal area approximately 1000 meters northwest of the reported depth. It is conceivable that a much lesser depth may exist in that area. ~~It is recommended that the 16-fathom reported depth be retained as charted.~~ Do not concur. *

PSI's #3A, #3B, #3C, and #3D - the reported depths of 46-, 60-, 62-, and 66-fathoms, charted in the vicinity of latitude 18°23.5' and longitude 67°24.5', originating with Chart Letters 446 of 1972, 410 of 1964, 828 of 1952, and 1305 of 1965 respectively, were investigated by the present survey. The development and depths obtained by the present survey ~~is~~ are not considered adequate to supersede all the reported depths. Present depths are in reasonable agreement with prior reported depths except in the vicinity of the reported 46. Recommend retaining the reported 46-fm. depth in lat. 18°23.5, long. 67°24.75'.

* The development in the vicinity of 2D and 2E above delineates a very flat-topped feature of depths of 44 to 46 fathoms. It is considered very unlikely that an additional rise of 28 to 30 fathoms could exist without some indication of its base on the 1/40,000 scale development of the feature. It is recommended that the charted 16-fathom reported depth in this area be disregarded.

PSI #4 - the 38-fathoms reported, charted in latitude 18°34.6' and longitude 67°13.15', originates with Chart Letter 452 of 1944. An investigation in the vicinity of this depth revealed shoaling to 34 fathoms three-fourths of a mile south of the reported position. It is believed that the positioning of this depth is questionable and it is recommended that this depth not be retained for charting. Chart lesser depths from present survey.

PSI #5 - the ten-fathoms reported, 1975, in latitude 18°24.7' and longitude 67°40.1', originating with HYDROLANT 855/75 (25) from Notice to Mariners No. 20 of 1975, was investigated by the present survey. A development of the area and the system of sounding lines in the adjacent area does not indicate the possibility of such a shoal depth or feature in the area. Therefore, it is recommended that the ten-fathoms reported be disregarded and present survey depths be charted.

PSI #9 - the 15-fathoms reported, 1971, charted in latitude 18° 20' and longitude 67°48', originating with Chart Letter 1034 of 1973, was investigated by the present survey. A development revealed depths of over 240 fathoms in the area of the reported depth. There is no indication of significantly lesser depths on this survey. It is recommended that the 15-fathoms reported be considered disproved and present survey depths be charted.

With the noted exceptions, the present survey is adequate to supersede the charted hydrography in the common area.

b. Aids to Navigation

There are no floating aids to navigation located within the limits of the present survey.

8. Compliance With Instructions

This survey does comply with the Project Instructions. (See HIT Report)

9. Additional Field Work

This is an adequate basic survey. Additional field work is not recommended.

Additional Notes

It is recommended that Isla Deamona Light be charted as a fixed aid. A geographic position was obtained from the U.S. Navy and was checked by AMC Operations Division personnel.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Atlantic Marine Center
439 West York Street
Norfolk, Virginia 23510

File No: D6-5
Ser. No: 77-98

August 8, 1977

CAM3/RAT

TO: RADM Robert C. Munson
Director, Atlantic Marine Center

FROM: CDR Robert A. Trauschke
Chief, Processing Division

SUBJECT: Hydrographic Inspection Team Report, H-9587 (1976)

This survey was accomplished by the NOAA Ship MT. MITCHELL in general compliance with Project Instructions OPR-423-MI-76, dated September 30, 1976. The purpose of this survey is to provide data to fulfill Defense Mapping Agency requirements, maintenance of existing charts, and future bathymetric mapping.

FIELD WORK

Paragraph 4.8 of the Project Instructions required a 1:100,000 scale survey; however, the ship conducted the survey at a 1:125,000 scale. This is in conflict with Sections 1.1.2 and 1.2.3 of the Provisional Hydrographic Manual. There is no indication that this change was ever submitted for approval.

Conducting hydrographic operations while carrying a corrector of more than 200 lanes is not in the spirit of what would be considered good hydrographic technique. Then, after suspending hydrography but before calibration, the lane corrector increased another 400 lanes. The visual calibration (one observation, no check angle) indicated a seven-lane closure (641 versus 634 lanes) which exceeds maximum allowable. The assumption was made that the seven lane discrepancy occurred after suspension of hydrographic operations. This also is not a good practice.

The TC/TI tape was developed improperly.

No positions were established at major course changes.

The nine-mile long holiday mentioned in the Descriptive Report, from 18° 41'N to 18° 50'N along longitude 67° 23', should have been addressed in the field.

VERIFICATION

A number of changes to depth curves were suggested by the Hydrographic Inspection Team.

A NOAA Form 76-40 was not submitted with the Descriptive Report, as per Section 5.3.4 of the Provisional Hydrographic Manual, for station 110, New Light on Mona Island.

In a number of instances the verifier should have been much more specific concerning disposition of Pre-survey Review Items.

The HIT Team devoted approximately 25 hours to this sheet.

Survey H-9587

Examined and Approved:
Hydrographic Inspection Team
Date: August 3,1977

CDR Robert A. Trauschke, NOAA
Chief, Processing Division

CDR Jeffrey G. Carlen, NOAA *
Chief, Coastal Mapping Division

T. Douglas Mason, LT, NOAA
Chief, EDP Branch

R. D. Sanocki
R. D. Sanocki
Technical Assistant, Processing

Guy F. Trefethen
Verification Branch

* Absent

Approved/Forwarded

Robert C. Munson
RADM, NOAA
Director, Atlantic Marine Center

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

C352

October 4, 1977

TO: A. J. Patrick
Chief, Marine Surveys Division

THRU: Chief, Quality Control Branch

FROM: K. W. Wellman
Quality Evaluator

SUBJECT: Quality Control Report For H-9587 (1976)
Puerto Rico, West Coast of Puerto Rico,
Canal De La Mona

A quality control inspection of H-9587 (1976) has been accomplished to evaluate the accuracy and adequacy of the survey with respect to data acquisition, delineation of the bottom, determination of least depths and navigational hazards, junctions, decisions and actions by the verifier and cartographic presentation of data.

In general, the present survey was found to conform to National Ocean Survey standards and requirements except as follows:

1. Two navigational aids (lighthouses) were described on the smooth sheet as landmarks. Only objects charted or recommended for charting as landmarks should be so described. Lights, while they may be excellent landmarks, are charted as navigational aids.

2. Multiple control stations were shown by a single symbol without explanatory notes on the smooth sheet. Station 37, HIGUERO 1966, was incorrectly labeled as a light.

3. An adequate junction was effected with H-9463 (1975) on the south during quality control evaluation. Several standard depth curves (600, 700, 800, and 900 fathoms) are not shown on H-9463 and were, therefore, left in pencil on H-9463 within the common area. Some irreconcilable depth differences of

20 to 25 fathoms were noted in the junctional area thus necessitating a partial butt junction to reconcile the associated depth curves. The depth differences are attributed to the significant effect of relatively slight displacement of soundings due to the small scale of the surveys and to the steep bottom gradients in the junctional area.

4. A crossline discrepancy of approximately 20 fathoms in the vicinity of lat. 18°41.90', long. 67°17.95' was not reconciled during verification. Examination of the fathograms during quality control evaluation revealed a previously undetected deep which reconciled the crossing discrepancy and improved the delineation of the 800 fathom depth curve in the area.

5. An inconsistent 116 fathoms sounding adversely affecting crossline agreement was noted in lat. 18°40.15', long. 67°57.99' in surrounding depths in excess of 150 fathoms. Examination of the records revealed that the referenced sounding as well as one additional sounding were 26 fathoms shoal due to the continued application of an excessive TRA corrector beyond the time when it should have been discontinued. In addition, the error resulting in the plotted 116 fathoms sounding was compounded by the application of an incorrect velocity corrector for the observed sounding. Appropriate revisions were effected during quality control evaluation.

6. No comparison was made with H-2938a during verification thus necessitating its comparison with the present survey during quality control evaluation.

7. Section 6 of the Verifier's Report (Comparison with Prior Surveys) does not include any mention of the magnitude of noted depth differences and does not include the required supersession of prior surveys statement (see provisional manual-section 6.6(11) and the memo dated 3-21-77 from the Office of Marine Surveys and Maps entitled "Verifier's Report Format").

Section 6 of the Verifier's Report is supplemented by the following:

There is good general agreement of depths over most of the common area with scattered indications of depth differences generally $\pm$ 7 fathoms and a few areas where differences of $\pm$ 70 fathoms were noted. In addition, depths on the present survey were as much as 100 fathoms shoaler in general depths in excess of 500 fathoms in an area of steep bottom gradient. The noted depth differences are attributed to the less accurate methods employed on the prior surveys.

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

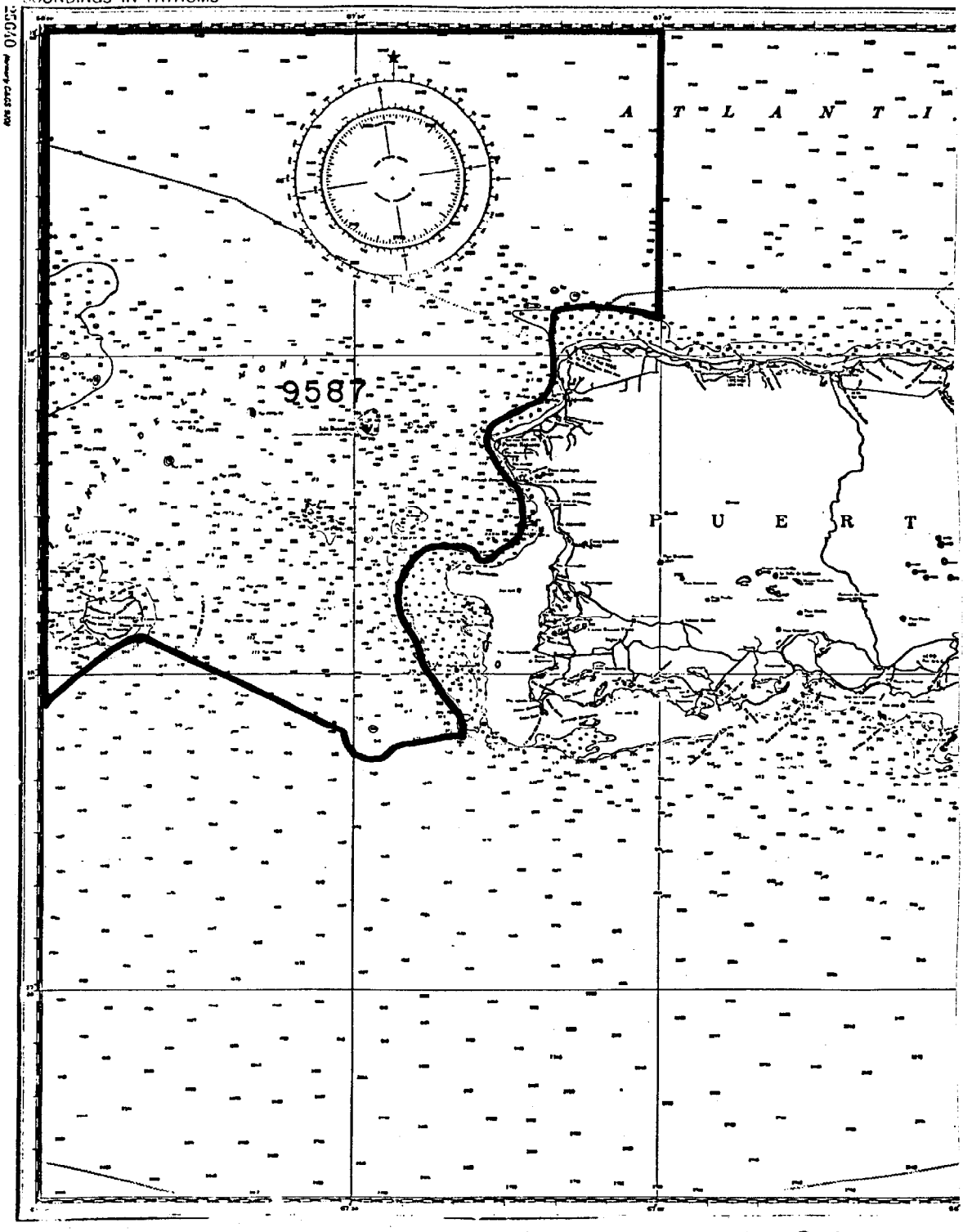
8. Section 7a of the Verifier's Report is supplemented by the following:

Numerous charted soundings are extremely inconsistent with general depths shown on the present survey; e.g., 1650 fathoms (charted in the vicinity of lat. 18°39.60', long. 67°19.00') and 1220 fathoms (charted in the vicinity of lat. 18°57.60; long. 67°37.00') in present survey depths of 500 to 600 fathoms and 1600 to 1700 fathoms, respectively. The charted depths originate with miscellaneous outside sources and prior surveys and are considered of questionable value in light of the development on the present survey.

Soundings generally less than 100 fathoms charted in the vicinity of lat. 18°35.00', long. 67°55.00' originate with 1971 and 1972 NOS trackline surveys (CL 762/71, CL441/72 and Bp82595 (1972)). The charted soundings are at variance with present survey depths and originate with sources considered to be less definitive than the present survey. The referenced area of the charts should be revised to agree with the present survey.

SOUNDINGS IN FATHOMS

CHART 220



FORM C&GS-8352
(3-25-63)

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. 9587

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
25673	1/30/80	Fannie Brown	Full ~~Part~~ ~~Before~~ After Verification Review Inspection Signed Via
			Drawing No. QC. Sheet Added two sdgs.
25671	1/30/80	Fannie Brown	Full ~~Part Before After~~ after Verification Review Inspection Signed Via
			Drawing No. QC. Sheet
25640	7/19/82	Rick Richter	Full ~~Part Before After~~ after Verification Review Inspection Signed Via
			Drawing No. QC. Sheet.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
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			Drawing No.