H11034

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic / Side Scan Sonar / Multibeam

Field No. "B"

Registry No. H11034

LOCALITY

State Commonwealth of Puerto Rico

General Locality South Coast of Puerto Rico

Locality Approaches to Las Mareas

2001

CHIEF OF PARTY
LCDR G. F. Glang

LIBRARY & ARCHIVES

DATE September 19, 2002

NOAA FORM 77-28
U.S. DEPARTMENT OF COMMERCE
(11-72)
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

REGISTRY NUMBER:

H11034

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.

State:	*Commonwealth of* **Puerto Rico**		
General Locality:	**South Coast of Puerto Rico**		
Sub-Locality:	**Approaches to Las Mareas**		
Scale:	**1:5,000**	Date of Survey:	**05/16/01 to 06/04/01**
Instructions Dated:	**03/19/01**	Project Number:	**OPR-I305-WH**
Vessel:	**NOAA Ship WHITING, S-329**		
Chief of Party:	**Lieutenant Commander Gerd F. Glang, NOAA**		
Surveyed by:	**WHITING Personnel**		
Soundings by:	**Odom Echotrac DF3200 MK II Echosounder** **Reson SeaBat 8101 multibeam sonar**		
Graphic record scaled by:	**WHITING Personnel**		
Graphic record checked by:	**WHITING Personnel**		
Protracted by:	**N/A**	Automated Plot:	**HP-750C** *(Field)*
Verification by:	**Atlantic Hydrographic Branch** *Personnel*		
Soundings in:	~~**Meters**~~ *Fathoms* **at MLLW**		

Remarks: *Red notes in the Descriptive Report were made during office processing.*

1) All Times are UTC.

2) This is a basic Hydrographic Survey.

3) Projection is UTM Zone 19.

AWOIS/SURF 8/26/02 SJV

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DESCRIPTIVE REPORT

to accompany
HYDROGRAPHIC SURVEY H11034

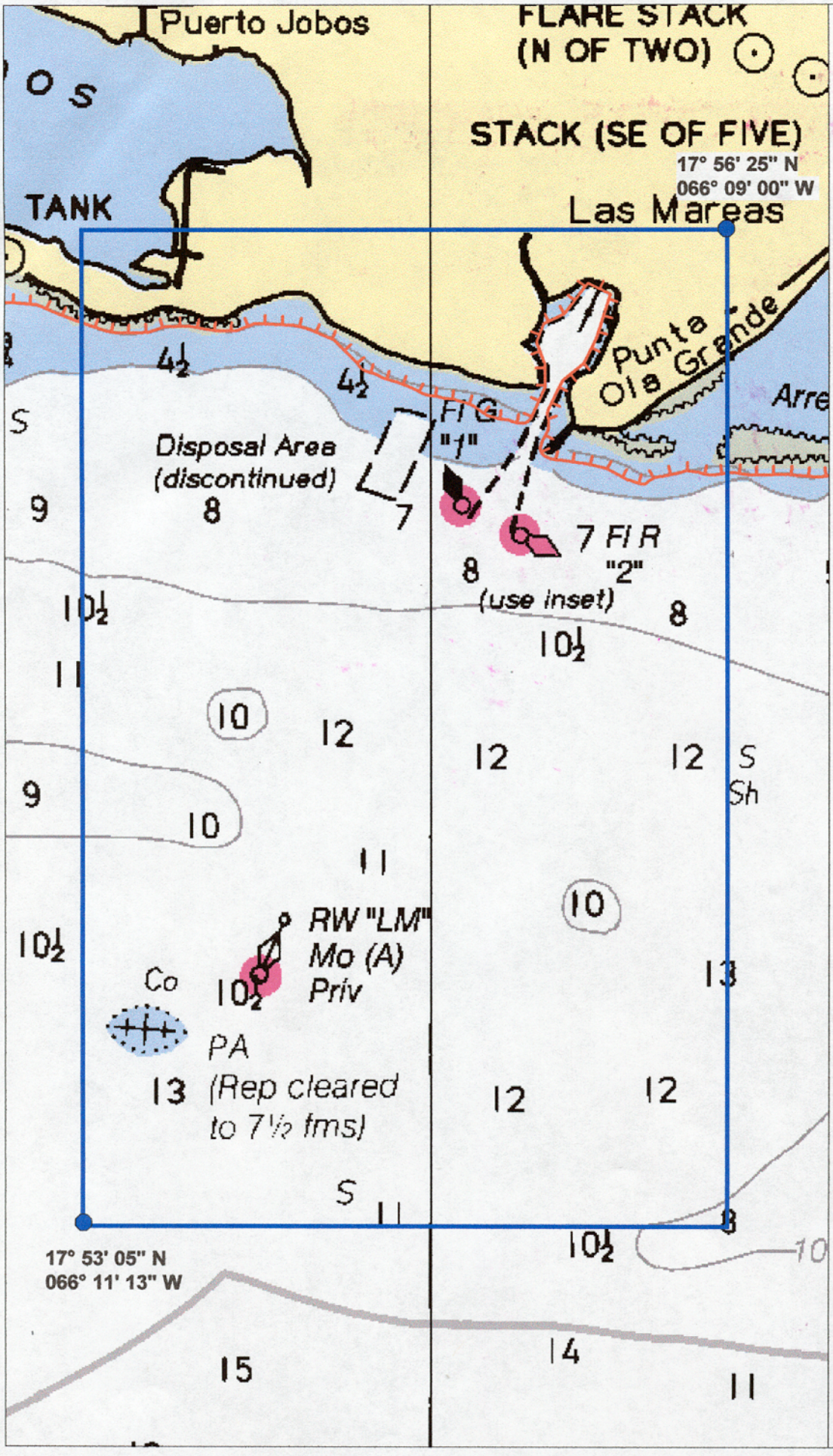
Scale of Survey: 1:5,000
Year of Survey: 2001
NOAA Ship WHITING
LCDR Gerd F. Glang, Commanding

A. AREA SURVEYED

This hydrographic survey was conducted in accordance with Hydrographic Survey Letter Instructions for project OPR-I305-WH, Approaches to Las Mareas. The instructions are dated March 19, 2001. No changes were made to the letter instructions.

This Descriptive Report pertains to sheet "B" of project OPR-I305-WH, which includes the approaches into Las Mareas. The assigned registry number for this sheet, as prescribed in the Letter Instructions, is H11034.

For complete survey limits, see the chart on the following page.



H11034 Survey and Sheet Limits

Chart 25677, 19th Edition, March 18, 1995. Guanica Light to Punta Tuna Light

NOT FOR NAVIGATION

NOAA Ship WHITING
LCDR Gerd F. Glang
Commanding
May 16, to
June 4, 2001

Soundings Acquired in: *Meters*
Soundings Displayed in: *Fathoms*
Sounding Datum: *MLLW*
Horizontal Datum: *NAD 83*
Projection: *UTM 19*
Central Meridian: *069° 00 00*
Scale Factor: *0.9996*

Project: *OPR-I305-WH*
Survey: *H11034*
State: *Puerto Rico*
Locality: *South Coast of Puerto Rico*
Sub-locality: *Approaches to Las Mareas*
Survey Scale: *1:5,000*

NATIONAL OCEANIC AND
ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

B. DATA ACQUISITION AND PROCESSING *See also the Evaluation Report*

EQUIPMENT

Data were acquired by NOAA Ship WHITING and Launch 1005. Launch 1005 is NOAA's standard 8.5-meter aluminum Jensen vessel with a typical 0.5-meter transducer draft.

Launch 1005 acquired vertical beam echosounder (VBES)[1], shallow-water multibeam (SWMB), side scan sonar (SSS), and sound velocity data. An Odom Echotrac DF3200 MK II echosounder was used for VBES hydrography. A Reson SeaBat 8101 multibeam system was used for SWMB hydrography. All positioning and attitude were determined with a TSS POS/MV 320 (version 2) GPS-aided inertial motion sensor. Side scan sonar data were acquired with an Edgetech 272-T towed side scan sonar. Velocity casts were conducted with SeaBird SeaCat CTD instruments. Launch 1005 also acquired detached positions (DP).

WHITING acquired VBES and SSS data. The Klein 5500 sonar was towed during data acquisition, and an Odom Echotrac DF3200 MK II echosounder was used for VBES hydrography. Positioning was determined with a Trimble DSM212L integrated differential GPS receiver. Attitude data was determined using a TSS DMS-05 attitude sensor. WHITING also acquired bottom samples.

No unusual vessel configurations or problems were encountered. Refer to the Data Acquisition and Processing Report (DAPR) for detailed equipment and vessel configuration information.

QUALITY CONTROL

Side Scan Sonar Quality Control

Daily confidence checks were made by observing the outer ranges of the side scan sonar images. A good check consisted of distinguishing contacts or sand waves across the entire range of the side scan trace. No unusual problems were encountered.

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[1] Launch 1005 VBES data were <u>not</u> processed when SWMB data were acquired.

Shallow Water Multibeam Quality Control

There were no faults with the SWMB system which affected data integrity. Refer to this project's DAPR for detailed discussion of SWMB system calibrations, data acquisition, and data processing.

Crosslines

14.8 nautical miles of VBES crosslines comprising 9.1% of the mainscheme data (100% and 200% SSS VBES) were acquired. Crossline and mainscheme comparisons were made in MAPINFO 5.0, and no differences greater than five percent were observed.

An area of developments east of the Fl R "2" buoy and south of Punta Ola Grande was selected for use as SWMB check line data. The SWMB data were acquired on DN 142, and consisted of eight mainscheme lines and five crosslines. Mainscheme and crossline data were analyzed in a **CARIS/HIPS** workfile (see project DAPR). Crossline data agreed with 95% to 100% of the mainscheme data, based on the International Hydrographic Organization (IHO) statistical standards used in the **CARIS** Quality Control Report (see Separate V).*

Junctions *See also the Evaluation Report*

No contemporary surveys were available for junction comparisons.

CORRECTIONS TO ECHO SOUNDING

All methods or instruments were used as described in the project DAPR. A table detailing all sound velocity casts is located in Separate III.*

** Filed with the original field records*

C. VERTICAL AND HORIZONTAL CONTROL *See also the Evaluation Report*

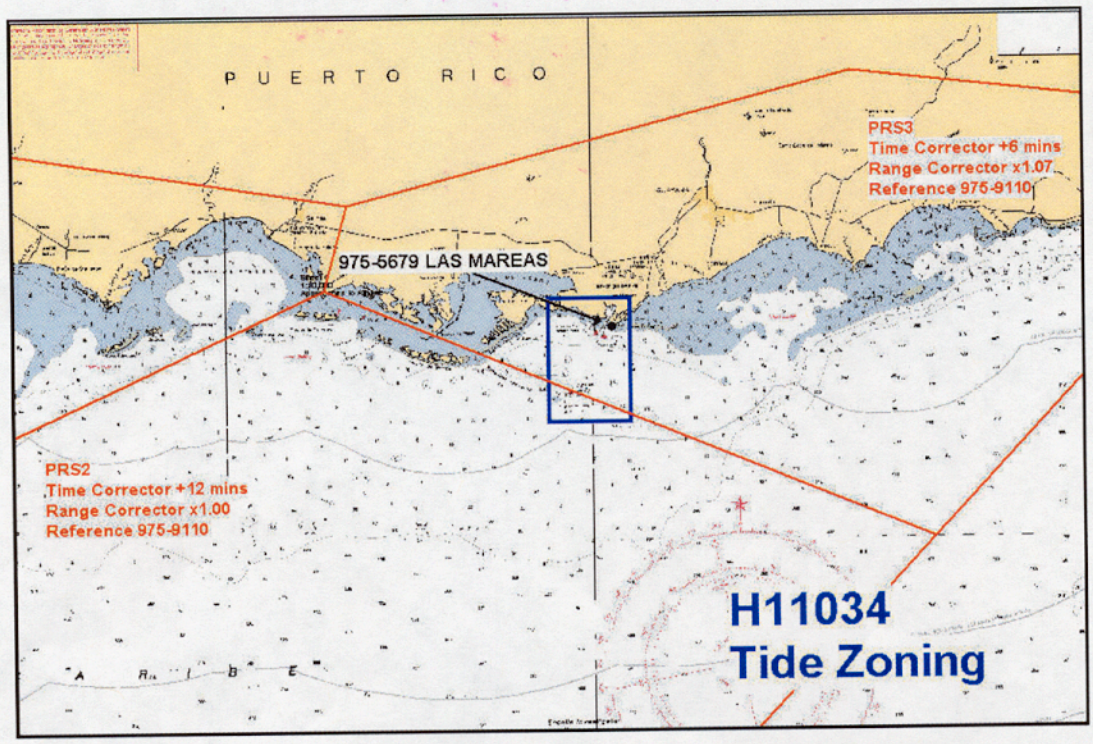
VERTICAL CONTROL

The tidal datum for this project is Mean Lower Low Water (MLLW). The operating tide station at Magueyes, PR (975-9110) served as control for datum determination. Tertiary, 30-day gauges at Las Mareas (975-5679) provided ancillary tide data.

Tidal zoning for this survey is consistent with the Letter Instructions. The zone used for this survey is as follows:

STATION	CORRECTOR (min)	RATIO	REFERENCE
PRS2	+12	x1.00	975-9110
PRS3	+6	x1.07	975-9110

A Request for Approved Tides letter was sent to N/OPS1 on July 23, 2001 (Appendix IV)*.



Verified tides from the N/OPS1 CO-OPS website were downloaded on July 6, 2001, and applied to all sounding data. *Approved tides and zones were applied in CARIS during office processing.*

** Filed with the original field data.*

HORIZONTAL CONTROL

The horizontal datum used for this survey is the North American Datum of 1983 (NAD 83), projected using UTM zone 19.

Sounding positional control was determined using the Global Positioning System (GPS) corrected by U.S. Coast Guard differential GPS (DGPS) beacon stations. The primary and only DGPS beacon used for this survey was Isabella, Puerto Rico. Horizontal control stations were not used for this survey.

In addition to performance checks, horizontal dilution of precision (HDOP) and the positional dilution of precision (PDOP) were monitored daily on both launches. Neither value exceeded 4.00, and adequate satellite coverage was maintained throughout the survey period.

D. RESULTS AND RECOMMENDATIONS *See also the Evaluation Report*

CHART COMPARISON

There are two charts affected by this survey:

25677, 19th edition, March 18, 1995, 1:100,000
25687, 11th edition, January 19, 1991, 1:20,000

General Agreement with Charted soundings

Sounding data agreed well with charted depths. Discrete differences are addressed in the "Dangers to Navigation" and "Charted Features" sections.

Soundings within the Las Mareas channel are consistent with the chart. The "bottleneck" area west of the Punta Ole Grande jetty continues to shoal the entrance. However the area inside the marked channel did not have any Dangers to Navigation. Soundings within Las Mareas basin are consistent with the chart. *Concur*

Soundings in areas approaching Las Mareas generally agree with charted depths, with three notable exceptions. First, the 9 fathom depth (Lat. 17° 54' 32.34" N, Long. 066° 11' 09.30" W) has migrated east on the charted 9 and 10 fathom shoal on the west side of the sheet. Second, 10 fathom soundings were found just north and south of the charted RW "LM", Mo (A) buoy; an area of charted 10 ½ fathoms depths. Finally, a band of gorgonian coral reef stretches across the lower third of the sheet. The shoalest soundings are 10 fathom soundings (Lat. 17° 53' 19.66" N, Long. 066° 09' 13.17" W) near the southeast corner, and 11 fathoms soundings (Lat. 17° 53' 06.85" N, Long. 066° 11' 11.34" W) towards the southwest corner.

Concur

AWOIS Item Investigations

There was one AWOIS items within the survey limits. The following discussion addresses that item.

AWOIS:11,013

Item Description: Unknown wreck with a reported clearance of 47ft (charted as 7.5 fathom)

Source: LNM19/88 (5/10/88)

Item Position: Lat. 17° 53' 46.2" N, Long. 66° 11' 00.2" W

Required Investigation: SD, S2, SWMB, DI **Radius:** 1,000 meter

Charts Affected: 25677, 25687

INVESTIGATION

Contact No: 141_141_1352_2, 137_219_1327_1, 137_220_1245_1

Date(s): DN 137, 141, 142

Least Depth Position Number: DN 142, Line 561_2020, Ping 196, Beam 17

Investigation Used: 200% SSS, SWMB

Surveyed Position: Lat. 17° 53' 49.45" N, Long. 66° 10' 52.03" W

Position Determined By: Differential GPS

Investigation Summary: 200% side scan sonar coverage was acquired within the 1000 meter search radius of AWOIS 11,013. Three contacts (141_141_1352_2, 137_219_1327_1, 137_220_1245_1) were selected and developed using SWMB. A wreck was found with a least depth of 59 ft (18.06 m, 10 fath), corrected with preliminary tides, in position Lat. 17° 53' 49.45" N, Long. 66° 10' 52.03" W.

CHARTING RECOMMENDATION

Recommendations: The hydrographer recommends that the charted wreck in position Latitude 17° 53' 46.2" N, Longitude 66° 11' 00.2" W be removed, and that a wreck with a least depth of 59 ft (18.06 m, 10 fathom) be charted in position Latitude 17° 53' 49.45" N, Longitude 66° 10' 52.03" W. ***Concur. Chart 25677: Delete the dangerous ~~sunken~~ wreck and the notation "PA (Rep cleared to 7½ fms)". Chart a dangerous 9½ fm Wk. Chart 25687: Delete the dangerous ~~sunken~~ wreck and notation "(Rep cleared to 47ft) PA". Chart a dangerous 59 ft Wk.***

Dangers to Navigation

A total of three Dangers to Navigation (DtoN) were reported by the Hydrographer to N/CS33 (AHB). For the complete DtoN report (sent August 14, 2001) see Appendix I*. The following table is a list of these DtoN's with reference to their source data. SWMB data is referenced by its **CARIS** file (project/vessel/DN/line/ping/beam). ***Not considered Dangers to Navigation during office processing.***

DTON #	LD (FATHS)	LEAST DEPTH LATITUDE	LEAST DEPTH LONGITUDE	CARIS SOURCE DATA (P/V/D/L/P/B)	DESCRIPTION
1	11	17° 53' 06.43 N	066° 11' 11.00 W	H11034/1005/144/ 767-1642/465/9	Shoal; several 11 fm soundings
2	11	17° 53' 32.80 N	066° 10' 28.23 W	H11034/1005/142/ 563-2035/369/63	Shoal; several 11 fm soundings
3	11	17° 53' 37.73 N	066° 09' 01.74 W	H11034/1005/144/ 599-1412/205/75	Shoal; several 11 fm soundings

Charted Features

A new stack was recently built at the American Energy Systems (AES), Puerto Rico, facility at Las Mareas. It is located at Lat. 17° 56' 41.58" N, Long. 066° 08' 57.09" W, and stands 461 feet high. This information was provided by David Stone from AES, on September 4, 2001, as described by his company's Federal Aviation Administration (FAA) landmark application.

Charting Recommendations

The hydrographer recommends changing the Las Mareas insert on chart 25677 to display all the charted soundings in feet. Currently the insert is in fathoms, but the labeled channel clearance is in feet. ***Concur***

A new pier is being built on the west side of the Las Mareas basin. AES Puerto Rico plans to dredge the area near the new pier to a least depth of 38 feet. This information was provided by David Stone from AES, on September 4, 2001 via telephone. WHITING requested a digital copy of these plans to include with this DR. However, at the time of submission, the plans have yet to be received. ***Retain as charted unless other information indicates otherwise.***

****Filed with the original field data.***

ADDITIONAL RESULTS

Aids to Navigation and Other Detached Positions

All of the aids to navigation positioned during this survey are on location. There were no aids to navigation surveyed that did not appear on the chart or in the *Light List*.

Detached positions were also acquired on several structures including docks and piers within the Las Mareas basin. The main structure is a 300 meter pier bisecting the basin. DP's were taken at several locations along both sides of the pier, including the tip where a lighted beacon is placed. West of the pier, a small floating dock and boat ramp were positioned, flanked by dolphins. Located to the east of the pier is a pump station surrounded by cement pilings. Finally, on the eastern side of the basin, a bulkhead was positioned.

Submarine Cables and Pipelines *See also section D.4. of the Evaluation Report*

A sewer outfall termination is located east of the Fl R "2" buoy and south of Punta Ola Grande. The exposed pipe stretches from Lat. 17° 55' 24.69" N, Long. 066° 09' 30.67" W to Lat. 17° 55' 15.99" N, Long. 066° 09' 27.73" W, and has an overall least depth of 6 fathoms. The point of land where the pipeline enters the water is undetermined.

E. APPROVAL SHEET

OPR-I305-WH
South Coast of Puerto Rico
Puerto Rico

Approaches to Las Mareas
Survey Registry No. H-11034

Field operations for this basic hydrographic survey were conducted under my daily supervision with frequent checks of progress and adequacy. All field sheets, this Descriptive Report, and all accompanying records and data are approved.

This survey is adequate to supersede all prior surveys in common areas, and for application to the relevant NOS nautical charts.

Respectfully,

Submitted:

LT Richard T. Brennan, NOAA
Field Operations Officer

Approved and Forwarded:

OCT 1, 2001

LCDR Gerd F. Glang, NOAA
Commanding Officer

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: November 19, 2001

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: OPR-I305-WH-2001
HYDROGRAPHIC SHEET: H11034

LOCALITY: Approaches to Las Mareas, Puerto Rico
TIME PERIOD: May 16 - June 4, 2001

TIDE STATION USED: 975-5679 Las Mareas, PR
Lat. 17° 55.7'N Lon. 66° 9.5'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 0.208 meters

TIDE STATION USED: 975-8053 Punta Guayanilla, PR
Lat. 17° 58.6'N Lon. 66° 45.7'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 0.212 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: PRS2.

Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time.

Note 2: Use tide data from the appropriate station with applicable zoning correctors for each zone according to the order in which they are listed in the Tidezone corrector files. For example, tide station one (TS1) would be the first choice for an applicable zone followed by TS2, etc. when data are not available.

11/19/01

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H11034 (2001)

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

B. AUTOMATED DATA ACQUISITION AND PROCESSING

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

MicroStation J, v. 7.1
MicroStation 95, v. 5.05
I/RAS B, version 5.01
NADCON, version 2.10
MapInfo, version 6.5
CARIS HIPS/SIPS 2000
PYDRO, version 1.11

The smooth sheet was plotted using a Hewlett Packard DesignJet 2500CP plotter.

JUNCTIONS

There are no junctional surveys to the south, east, and west. Present survey depths are in harmony with the charted hydrography to the south, east, and west.

C. HORIZONTAL CONTROL

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

To place this survey on the NAD 27, move the projection lines 7.111 seconds (218.622 meters or 43.72 mm at the scale of the survey) south in latitude, and 1.402 seconds (41.253 meters or 8.25 mm at the scale of the survey) east in longitude.

D. RESULTS AND RECOMMENDATIONS

COMPARISON WITH CHARTS 25677 (19th Ed., Mar. 18/95)
25687 (11th Ed., Jan. 19/91)

The charted hydrography originates with the prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in section D. of the Descriptive Report. Attention is directed to the following:

1. The charted note, *38 FEET 1977*, in the vicinity of Latitude 17°55'36"N, Longitude 66°09'42"W, is no longer correct. Present survey depths range from 32 to 42 feet. It is recommended that the note be revised to *32 FEET 2001*.

2. The charted note, *33 FEET 1980*, in the vicinity of Latitude 17°56'00"N, Longitude 66°09'33"W, is no longer correct. The present survey depths range from 35 to 38 feet. It is recommended that the note be revised to *35 FEET 2001*.

3. The charted Discontinued Disposal Area in the vicinity of Latitude 17°55'42"N, Longitude 66°10'07"W, has been covered by the present survey. It is recommended that the Discontinued Disposal Area be deleted from the charts.

4. A portion of the charted Outfall in the vicinity of Latitude 17°55'22"N, Longitude 66°09'26"W, was located by the hydrographer approximately 90 meters southwest of the charted position. It is recommended that the charted outfall be researched by Source Data Section and then revised as needed.

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

COMPARISON WITH PRIOR SURVEYS

A comparison with prior surveys was not done during office processing in accordance with section 4. of the memorandum titled *Changes to Hydrographic Survey Processing* dated May 24, 1995.

SHORELINE

The shoreline in the vicinity of Latitude 17°56'14"N, Longitude 66°09'21"W, was revised during office processing and is shown as red dashed lines on the present survey. It is recommended that the charted shoreline be revised as shown on the present survey.

ADEQUACY OF SURVEY

This is an adequate hydrographic/side scan sonar/multibeam survey. No additional field work is recommended

MISCELLANEOUS

Chart compilation was done by Atlantic Hydrographic Branch personnel, in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division, Silver Spring, Maryland. The following NOS Charts were compiled using present survey data: 25687 (11th Edition, Jan 19/91)
25677 (19th Edition, Mar 18/95)

Robert Snow

Robert Snow
Cartographic Technician
Verification of Field Data
Evaluation and Analysis

APPROVAL SHEET
H11034 (2001)

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disproval of charted data. The digital data have been completed and all revisions and additions made to the smooth sheet during survey processing have been entered in the digital data for this survey. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

R. H. Whitfield Date: 7/17/02

Richard H. Whitfield
Cartographer
Atlantic Hydrographic Branch

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Emily B. Christman Date: 7/17/02

Emily B. Christman, CDR, NOAA
Chief, Atlantic Hydrographic Branch

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Final Approval:

Approved: Samuel P. De Bow, Jr. Date: 9/19/02

Samuel P. De Bow, Jr.
Captain, NOAA
Chief, Hydrographic Surveys Division