

NOVEMBER 2011

Environmental Assessment

**GULF INTRACOASTAL WATERWAY (GIWW) CUTS M-5, M-12,
AND M-14, & LONGBOAT PASS CUTS LP-2 AND LP-3**

**MAINTENANCE DREDGING WITH NEARSHORE MATERIAL
PLACEMENT**

MANATEE AND HILLSBOROUGH COUNTIES, FLORIDA



**U.S. Army Corps
of Engineers**
JACKSONVILLE, DISTRICT



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

**OPERATIONS AND MAINTENANCE DREDGING,
GULF INTRACOASTAL WATERWAY AND LONGBOAT PASS WITH
NEARSHORE PLACEMENT**

MANATEE AND HILLSBOROUGH COUNTY, FLORIDA

FINDING OF NO SIGNIFICANT IMPACT

I have reviewed the Environmental Assessment (EA) of the Preferred Alternative and the No Action Alternative. The Preferred Alternative involves the continued operations and maintenance dredging of the Gulf Intracoastal Waterway Cuts M-5, M-12 and M-14, and Longboat Pass Cuts 2 and 3, with disposal in the nearshore located east of Egmont Key in Hillsborough County, or along the shoreline of Longboat Key in Manatee County, FL. This Finding incorporates by reference all discussions and conclusions contained in the EA enclosed hereto. Based on information analyzed in the EA, reflecting pertinent information obtained from other agencies and special interest groups having jurisdiction by law and/or special expertise, I conclude that the proposed action will have no significant impact on the quality of the human environment. Reasons for this conclusion are in summary:

- a. The U.S. Army Corps of Engineers, Jacksonville District, will take measures to minimize the effects to the endangered West Indian Manatee and endangered and threatened sea turtles. There will be no unauthorized impacts to other threatened and endangered species. The project will not jeopardize the continued existence of any federally listed species or adversely modify designated critical habitat.
- b. I have determined that ongoing maintenance dredging will have no adverse affect on significant historic properties. Coordination with the Florida State Historic Preservation Officer and appropriate federally recognized tribes has been initiated. We are anticipating concurrence with this determination.
- c. State water quality standards will be met. A Maintenance Dredging Joint Coastal Permit (JCP) was issued on November 14, 2011.
- d. The Corps has determined that the proposed project is consistent with the Coastal Zone Management Act (CZMA). The final concurrence from the State was issued on November 14, 2011 along with the JCP.

e. Measures to eliminate, reduce below the level of significance, or avoid potential impacts to fish and wildlife resources will be implemented during project construction.

f. The proposed project has been evaluated pursuant to the Migratory Bird Treaty Act. The Jacksonville District's Migratory Bird Protection procedures will be implemented for this project and for future projects. These procedures have been coordinated with the U.S. Fish and Wildlife Service and the State of Florida.

g. Benefits to the public will include maintenance of the navigation channel and continued local economic stimulus..

In consideration of the information summarized, I find that the proposed action will not significantly affect the human environment and does not require an Environmental Impact Statement. This document will be available to the public on the U.S. Army Corps of Engineers Jacksonville District website at:

http://www.saj.usace.army.mil/Divisions/Planning/Branches/Environmental/DocsNotices_OnLine_ManateeCo.htm



ALFRED A. PANTANO, JR.
Colonel, Corps of Engineers
Commanding

11/23/11

11/23/11

Date

ENVIRONMENTAL ASSESSMENT

GULF INTRACOASTAL WATERWAY & LONGBOAT PASS MAINTENANCE DREDGING WITH NEARSHORE PLACEMENT MANATEE - HILLSBOROUGH COUNTY, FLORIDA

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**ENVIRONMENTAL ASSESSMENT
MAINTENANCE DREDGING WITH NEARSHORE PLACEMENT
GIWW LONGBOAT PASS
MANATEE/HILLSBOROUGH COUNTY, FLORIDA**

1 PROJECT PURPOSE AND NEED

1.1 INTRODUCTION

The Jacksonville District Army Corps of Engineers (Corps) proposes long-term, ongoing maintenance dredging within the Gulf Intracoastal Waterway (GIWW) and Longboat Pass located in Manatee County, Florida. When a Federal navigation project is authorized, it is generally the responsibility of the Corps to maintain the channel. As part of that responsibility, the channels are monitored for build-up of shoals, and if the situation warrants, disposal areas are acquired by the local sponsor. The disposal option with the least cost is the designated baseline for management of the project. If the local sponsor should desire another option, that acquisition option is cost shared.

1.2 PROJECT AUTHORITY

The GIWW from the Caloosahatchee River to the Anclote River, Florida was authorized at 100 feet wide by 9 feet deep by H. Doc. 371/76/1 on 2 March 1945, and Longboat Pass (Florida) was authorized on 14 July 1960 (approved by the Chief of Engineers 20 April 1976, under Section 107 of 1960 Rivers and Harbors Act) at 12-feet-deep by 150 feet wide from the Gulf of Mexico to Longboat Pass Bridge; thence, 10-feet deep by 100 feet wide to and along the GIWW to the Cortez Bridge (which divides Anna Maria Sound from Sarasota Bay).

1.3 PROJECT LOCATION

The project consists of two components: the Federal navigation channel included in the dredging activity, and the placement of the dredged material. A fold-out map is located at the end of this document as an aid to follow during review of the Environmental Assessment (EA).

1.3.1 MAINTENANCE DREDGE AREA

The Federal navigation project is located along the GIWW within Sarasota Bay adjacent to Longboat Key, Jewfish Key, and Anna Maria Island, Gulf of Mexico, Manatee County, Section 9, 10, 15, 16, Township 35 South, Range 16 East, Manatee County, Florida (**Figure 1**).



Figure 1. Project Location Map

1.3.2 NEARSHORE/BEACH PLACEMENT

The dredged material placement will occur in the nearshore environment approximately 1,500 – 5,000 linear feet from the western shoreline of Egmont Key, which is located about 12.5 miles north of the dredge site at the mouth of Tampa Bay in Hillsborough County, Florida, (**Figure 2**). In the event that a cutterhead dredge with a discharge

pipeline will be used for dredged material placement, the material may be placed along the shoreline of Longboat Key, approximately 7,600 feet south of Longboat Pass, between Florida Environmental Protection (FDEP) Monuments R-44 and R-51, (**Figure 3**).

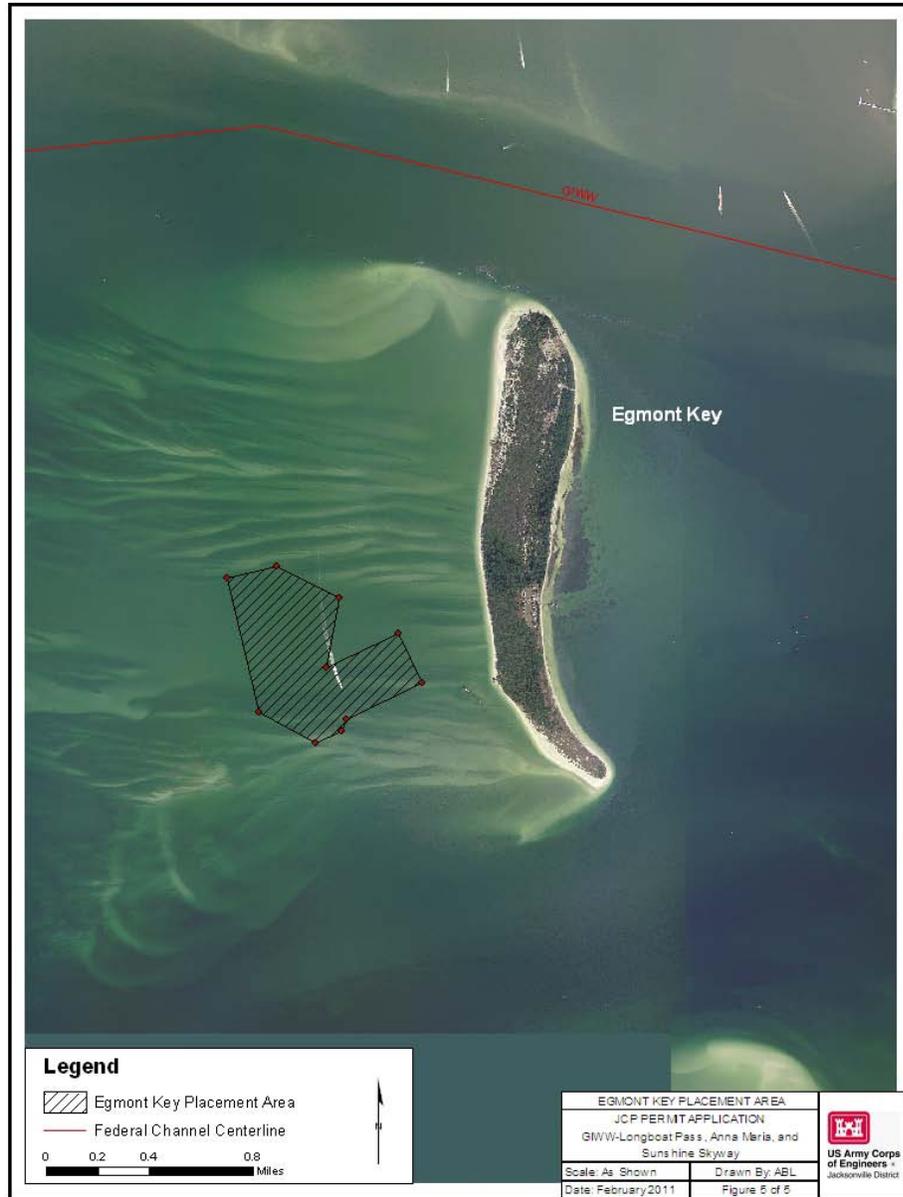


Figure 2. Egmont Key Placement Location Map. Cross-hatched area is the proposed location for placement of dredged materials, approximately 1,500 feet from west shoreline of Egmont Key.

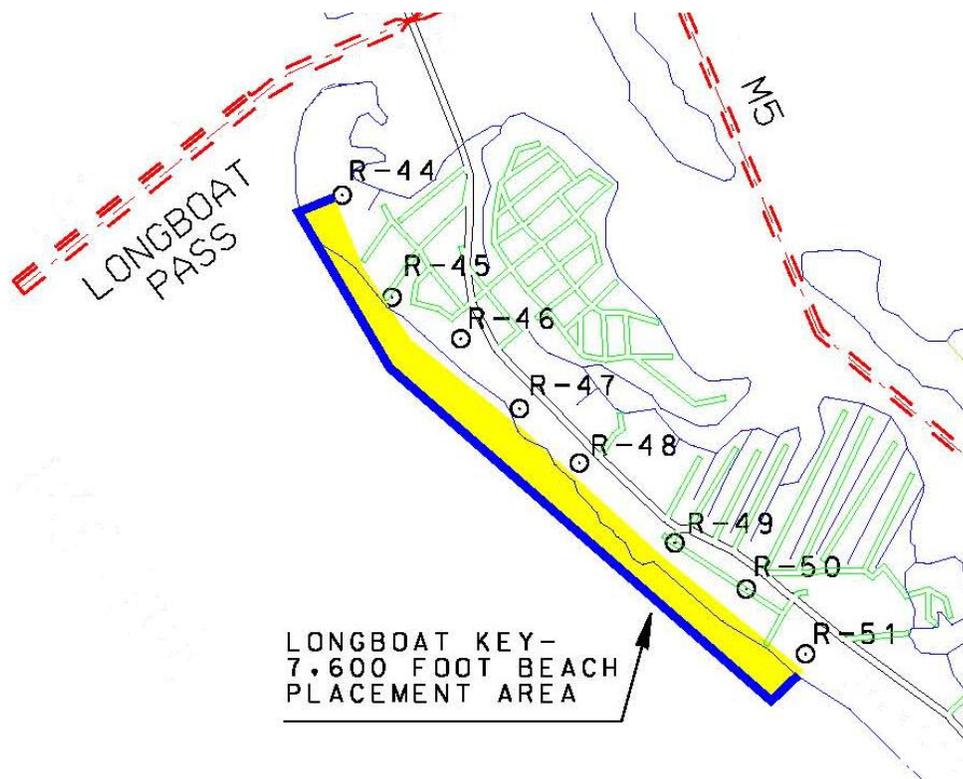


Figure 3: Longboat Key Beach is the alternate site for placement of dredged materials in the event that a cutter-suction type dredge is used.

1.4 PROJECT NEED OR OPPORTUNITY

The Corps proposes the performance of maintenance dredging within specific sections of the GIWW and at the Federal maintained Longboat Pass inlet. This project will ensure unobstructed and safe passage of vessels from the Gulf of Mexico into and along the GIWW.

1.4.1 PROJECT HISTORY

Federal authorization of the GIWW was allocated as far back as 1890, when a shipping channel was funded and constructed within Sarasota Bay reaching to Tampa Bay (Alperin, 1983). The 1945 authorization by Congress provided the initial funding for a feasibility study of the GIWW from the Caloosahatchee River to the Anclote River north of Tampa Bay. The original dimensions of the GIWW within this area were authorized at 100 feet in width and 9 feet in depth. The 148-mile segment of the GIWW (from the Caloosahatchee River to the Anclote River) was constructed between 1960 and 1967 (Alperin, 1983). The channel of the GIWW between these two rivers was routed east of the barrier islands or “keys” to protect the channel and vessels from storm effect. Subsequent maintenance dredging for the GIWW within the project area is believed to have occurred since the 1960’s, but this is unverified.

Longboat Pass is an inlet to the north end of Sarasota Bay in Manatee County, between Anna Maria Island and Longboat Key, both of which are highly developed Gulf Coast barrier islands. The Longboat Pass consists of three cuts. The first, Cut 1, starts 0.5 mile west of the barrier islands and connects to Cut 2 several hundred feet west of the Longboat Pass Bridge. The second, Cut 2, intersects the Longboat Pass Bridge and connects to Cut 3 at the point of intercept just clearing the northern end of Longboat Key. The third, Cut 3, transects in a northeasterly direction and terminates at the intersection with the Gulf Intracoastal Waterway at channels M-5 and M-6.

1.5 DECISION TO BE MADE

The decision to be made is how to best maintain these Federal channels and the best location to place the dredged material, consistent with the Federal standards.

1.6 AGENCY GOAL OR OBJECTIVE

1.6.1 GENERAL DESCRIPTION

Routine maintenance dredging is proposed within the GIWW, and Longboat Pass Federal channels. Approximately 94,500 cubic yard of shoal material has accumulated in several channel cuts and the existing settling basins, creating conditions potentially hazardous to safe navigation.

1.6.2 MAINTENANCE DREDGE SITES

Several segments within the GIWW from the Caloosahatchee River to the Anclote River, and existing channel segments within the vicinity of Longboat Pass, are proposed to be dredged as needed to restore authorized channel depth. Maintenance dredging proposed with this action includes the segments of the existing federally authorized Longboat Pass (Cuts 2 and 3) and Cuts M-5, M-12 and M-14 within in the GIWW. All proposed dredge sites are adjacent to the south end of Anna Maria Island and the north end of Longboat Key. Placement of dredge material will occur either in the nearshore environment of Egmont Key or along Whitney Beach on Longboat Key between FDEP markers R 44 and R 51.

1.7 RELATED ENVIRONMENTAL DOCUMENTS

1.7.1 1995 FONSI/FINAL ENVIRONMENTAL ASSESSMENT (ISSUED NOV 1995)

Maintenance Dredging and Placement Environmental Assessment for Longboat Pass, Manatee County, Florida and attached Finding of No Significant Impact (FONSI) pertains to the dredging project for Cuts 1, 2, and 3 of Longboat Pass. The project scope included the Longboat Pass Federal navigational channel for the three reaches, and a settling basin and three channel wideners, for a total of 250,000 cubic yards of material placement on Longboat Key and Anna Maria Island beaches. The project area

did not include channels within the GIWW. The maximum depth of the dredging in Cuts 1 and 2 was -12 feet plus 2-foot advanced overdepth maintenance dredging. The project also included Cuts 2 and 3 of channel widening in the reach and a total depth of -10 feet at mean low water (MLW) plus a 2-foot advance overdepth maintenance dredging. The designed width of the basin was 100 feet. Dredged material was to be used for beach renourishment on Longboat Key Beach between FDEP markers R 34 and R 39, and on Anna Maria Island Beach at FDEP markers R 44 and R 55. To review this document, please see:

<http://www.saj.Corps.army.mil/Divisions/Planning/Branches/Environmental/DOCS/Online/Manatee/LongboatPass/part-1.pdf>

1.7.2 FLORIDA DEPT OF ENVIRONMENTAL PROTECTION (FDEP) PERMITS

FDEP Permit no. 410289759, issued on 11 September 1981, was modified by Permit no. 4117289759 on 11 August 1986, and expired on 4 September 1991. The permit authorized dredging in all reaches of Longboat Pass and placement of dredged material on Longboat Key for beach renourishment. This dredging did not extend into the channels within the GIWW.

FDEP Permit no. 412376569 was issued with an extension on 13 May 1997 for authorization and water quality certification (WQC) of the project as described in the FONSI/Final EA dated November, 1995; see section 1.7.1 above.

1.8 PERMITS REQUIRED

In accordance with the Interagency Coordination Agreement for Civil Works Projects between the Corps and the FDEP dated 28 February 2006, the Corps obtained a permit from the FDEP that includes water quality certification and the final finding of coastal zone consistency (FDEP Permit no. 0157891-009-EI, issued April 7, 2006). This permit includes a finding of "reasonable assurance" that the project is in compliance with all water quality standards, as well as all the other enforceable regulations included in the Florida Coastal Zone Management Program. Please also refer to Section 5.0: Compliance with Environmental Requirements. A copy of this is included in Appendix C.

1.9 SCOPING AND ISSUES

1.9.1 ISSUES EVALUATED IN DETAIL

The following issues were identified to be relevant to the proposed action and appropriate for detailed evaluation:

- a. Water quality
- b. Endangered Species and Critical Habitat

- c. Historic properties
- d. Noise
- e. Safety
- f. Fish and wildlife resources
- g. Essential Fish Habitat (EFH)
- h. Recreation
- i. Navigation
- j. Economics

1.9.2 IMPACT MEASUREMENT METHODOLOGY

An interdisciplinary team used a systematic approach to analyze the affected area, evaluate the environmental effects, and write this EA. The analysis included literature research, field investigations, and coordination with resource agencies and private groups having expertise with the relevant issues.

The proposed action requires review under the evaluation process of the Florida State Clearinghouse and the FDEP.

Coordination and agencies evaluation are also required by the U.S. Fish and Wildlife Service (FWS), NOAA's National Marine Fisheries Service (NMFS), the U.S. Environmental Protection Agency (EPA), Florida Fish and Wildlife Conservation Commission (FWC), and the Florida State Historic Preservation Officer (SHPO).

2 ALTERNATIVES

2.1 INTRODUCTION

The project options/alternatives under consideration include the following:

- o No action
- o Maintenance dredging of GIWW Cuts M-5, M-12, and M-14 (as depicted in **Figure 1**), and Longboat Pass Cuts 2 and 3 by use of a hopper dredge, with disposal in the nearshore area of Egmont Key (as depicted in **Figure 2**); herein is described as the "Preferred Alternative – Hopper Dredge", and
- o Maintenance dredging of GIWW Cuts M-5, M-12, and M-14, and Longboat Pass Cuts 2 and 3 by use of a suction-cutterhead dredge with disposal placement along the shoreline of Longboat Key between FDEP markers R 44 and R51 (as depicted in **Figure 3**); herein is described as the "Preferred Alternative – Cutterhead Dredge", dependent upon the type of equipment provided by Corps or contractor at time of award.

2.2 HISTORY OF ALTERNATIVES FORMULATION

From the 1880 to the present, dredging activity has maintained the various navigation channels in Sarasota Bay. Historically, the dredged material was utilized as beach re-nourishment material or fill for wetlands. Low-lying areas were converted to uplands to promote residential and commercial development and to aid in the construction of roadways through these areas.

During the development of this project, the entire GIWW and adjoining Longboat Pass was evaluated to identify the channel cuts most in need of maintenance dredging. The scoping process originally identified Cuts M-5, a section of M-12, and a section of M-14 as the most critical cuts requiring maintenance for safe navigation. Longboat Pass Cuts 2 and 3 exhibited extensive accumulation of shoal material.

Regarding dredged material placement opportunities, Egmont Key was identified as having the most critical need for sand placement and can accommodate deposition from a split-hull hopper dredge. The western portion of the island is experiencing significant erosion. The FWS has expressed interest in obtaining suitable dredged materials for use in replenishing the eroding sand. Based on these factors, Egmont Key has been considered the best option for the disposal of dredged materials for this project. The nearshore of Egmont Key will be used rather than beach placement to accommodate the discharge operation from a split-hull hopper dredge. In the unlikely event that a hopper dredge will not be used for removal of material within the afore-referenced channels, discharge by pipeline from a cutterhead dredge will occur along the shoreline of Longboat Key below mean lower low water (MLLW) line to also avoid impacts to nesting sea turtles.

2.3 DESCRIPTION OF ALTERNATIVES

This section describes the three alternatives evaluated in this EA.

2.3.1 NO-ACTION ALTERNATIVE (STATUS QUO)

The No Action Alternative would not result in any changes to improve the navigability for this portion of the Federal channel. GIWW Cuts M-5, M-12, and M-14, along with Longboat Pass Cuts 2 and 3, would continue to experience increased general navigational hazards from shoal accumulation, and create unsafe conditions for vessels traversing in these Federal waterways.

2.3.2 CONDUCT MAINTENANCE DREDGING OF GIWW AND LONGBOAT PASS CUTS WITH A HOPPER DREDGE

A second alternative is the removal of approximately 64,500 cubic yards of material from GIWW Cuts M-5, M-12, and M-14 collectively and the removal of 30,000 cu yd of material from Longboat Pass Cuts 2 and 3; see Table 1 below. The quantity of material represents dredging the channel to the appropriate required depth plus an allowable 2 feet of overdepth. The dredged material is proposed to be placed in the nearshore of Egmont Key if a split-hull hopper type dredge is used (**Figure 2**, Section 1).

2.3.3 CONDUCT MAINTENANCE DREDGING OF GIWW AND LONGBOAT PASS CUTS WITH A CUTTERHEAD DREDGE

A third alternative is the removal of material from the same locations shown in Table 1 by use of a cutterhead dredge. The material may be disposed adjacent to the shoreline area of Longboat Key between FDEP marker R 44 and R 51 if a cutterhead dredge is used (**Figure 3**, Section 1).

Table 1 Description of Maintenance Dredge Areas

Cut Name	Station/Length (Linear Feet)	Cubic Yards Removed	Authorized Depth + AO ¹
GIWW M-5	2+00 – 19+00; 21+00 – 57+00 / 5300	45000.0	-9.0 + 2
GIWW M-12	23+00 – 37+00 / 1400.00	7000.0	-9.0 + 2
GIWW M-14	0+00 – 7+00 / 700.00	12500.0	-9.0 + 2
LB Cut 2	17+00 – 20+50 / 350.00	3000.0	-10.0 + 2
LB Cut 3	0+00 – 19+00 / 1900.00	27000.0	-10.0 + 2

AO¹ = Allowable Overdepth

2.4 PREFERRED ALTERNATIVE

Two Preferred Alternatives are presented in this document. The final selection will be dependent upon such factors as mobilization availability or cost constraints at the time of construction. Preferred Alternative – Hopper Dredge proposes to conduct maintenance dredging of GIWW Cuts M-5, M-12, M-14, and Longboat Pass Cuts 2 and 3 with placement of dredged materials in the nearshore area of Egmont Key (**Figures 1 and 2**, Section 1). Preferred Alternative – Cutterhead Dredge proposes to conduct maintenance dredging of the same channel areas, with shoreline placement of Longboat Key between FDEP markers R 44 to R 51 (**Figure 3**, Section 1).

2.4.1 ISSUES AND BASIS OF CHOICE

The Preferred Alternative – Hopper Dredge was chosen due to its ability to cost-effectively accomplish the goals and objectives of the project. It will maintain safe navigability of this portion of the GIWW and Longboat Pass. In the event that this alternative is not available for future, long-term maintenance, Preferred Alternative – Cutterhead Dredge will be used.

2.4.2 TYPE OF DREDGING EQUIPMENT

The Corps does not normally specify the type of dredging equipment to be used. Generally, this is left to the dredging industry to offer the most appropriate and economical equipment available at the time. However, certain types of dredging equipment may be considered more appropriate than others based on the type of material, the depth of the channel, the depth of access to the disposal or placement site, the amount of material, the distance to the disposal or placement site, the wave-energy environment, etc. A more detailed description of types of dredging equipment and their characteristics can be found in Engineer Manual, EM 1110-2-5025, *Engineering and Design - Dredging and Dredged Material Disposal*. This Engineer Manual is available on the internet at

<http://www.Corps.army.mil/publications/eng-manuals/em1110-2-5025/toc.htm>

2.4.3 REQUIRED, ALLOWABLE, AND OVERCUT BEYOND THE PROJECT DEPTH OR WIDTH

The project-specific plans and specifications normally require dredging beyond the authorized project depth or width. The purpose of the “required” additional dredging is to account for shoal accumulation between dredging cycles, to reduce the frequency of dredging required to maintain the project depth for navigation. In addition, the dredging contractor is allowed to go beyond the required depth. This “allowable” overage in dredging accounts for the inherent variability and inaccuracy of the dredging equipment (normally ± 2 feet).

The dredge operator may also practice over-cutting. An “overcut” along the sides of the channel may be employed in anticipation of movement of material down the sides of the channel. An overcut throughout the channel bottom may be the result of furrowing or pitting by the dredging equipment (the suction dredge’s cutterhead, the hopper dredge’s drag arms). Some mixing and churning of material below the channel bottom may also occur, especially with a large cutterhead.

Generally, as the equipment size increases, so does the potential for overcut and mixing of material below the “allowable” channel bottom. Some of this material may become mixed-in with the dredged material. If the characteristics of the material in the overcut and mixing profile differ from that above it, the character of the dredged material may be altered. The quantity and/or quality of material for disposal or placement may be

substantially changed depending on the extent of over-depth and over-cut (see **Figure 4**).

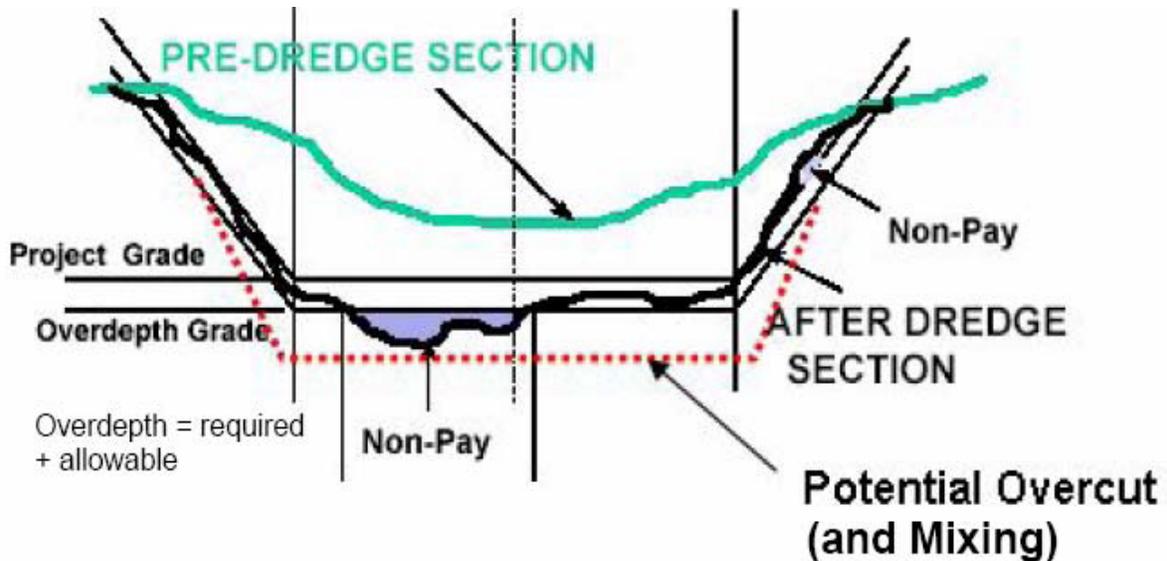


Figure 4. Diagram of typical dredge area cross-section

2.4.4 USE OF A DRAG BAR

Since dredging equipment does not typically result in a perfectly smooth and even channel bottom (see discussion above), a drag bar, chain, or other item may be dragged along the channel bottom to smooth down high spots and fill in low spots. This finishing technique also reduces the need for additional dredging to remove any high spots that may have been missed by the dredging equipment. It may be more cost effective and possibly less hazardous to sea turtles to use a drag bar or other leveling device rather than to conduct additional hopper dredging. Please see Section 5.3 for a discussion of the National Marine Fisheries Service (NMFS) Gulf Region Biological Opinion and effects on federally protected listed species.

2.5 ALTERNATIVES ELIMINATED FROM DETAILED EVALUATION

The project site is within a federally authorized and maintained channel; therefore, maintenance dredging is necessary for compliance with a national mandate to maintain free and unobstructed navigation. Dredging alternatives are limited to only the shoal material obstructing, or having the potential to obstruct, navigation within the channel's existing footprint.

Ocean disposal was not considered a practicable alternative, given the distance to the nearest Offshore Dredge Material Disposal Site (ODMDS), which is located more than

12 miles west of the project site in the Gulf of Mexico. Nearshore disposal is proposed to accommodate the probable use of a hopper dredge, and is the desired method of disposal that also is considered to have beneficial use. Additionally, shoreline placement of dredged material via pipeline discharge from a cutterhead dredge would be another desired and beneficial use of the proposed material.

2.6 COMPARISON OF ALTERNATIVES

The alternatives considered for this project are compared and summarized in Table 2. This comparison lists the major features and consequences of the proposed action and alternatives. See Section 4.0, starting on page 33, for a more detailed discussion of the potential impacts of each alternative.

Table 2 Effects for Alternative Comparison Chart

ALTERNATIVE ENVIRONMENTAL FACTOR	PREFERRED ALTERNATIVE – HOPPER DREDGE WITH NEARSHORE PLACEMENT AT EGMONT KEY; PREFERRED ALTERNATIVE – CUTTERHEAD DREDGE WITH PLACEMENT ON SHORELINE OF LONGBOAT KEY	NO ACTION ALTERNATIVE – STATUS QUO
Water Quality	Temporary moderate short-term increases in turbidity from the dredging operation.	Frequent short-term increases in turbidity from vessel contact with substrate due to diminished bottom clearance.
Historical Properties	No adverse effect.	Continued erosion conditions will affect Egmont Key and Longboat Key.
Noise	Temporary increase in noise levels at the dredging and discharge sites, potentially affecting recreational boaters.	No impact.
Safety	Moderate long-term benefit to navigation.	Major adverse impact on vessels entering harbor area from reduced channel depths.
ESSENTIAL FISH HABITAT	Temporary displacement of fish and infaunal communities in the dredged areas. Impact to fish and Infaunal communities from material disposal at placement site.	Frequent short-term reductions in water quality due to turbidity from boats disturbing bottom sediments at decreased depths.

ALTERNATIVE ENVIRONMENTAL FACTOR	PREFERRED ALTERNATIVE – HOPPER DREDGE WITH NEARSHORE PLACEMENT AT EGMONT KEY; PREFERRED ALTERNATIVE – CUTTERHEAD DREDGE WITH PLACEMENT ON SHORELINE OF LONGBOAT KEY	NO ACTION ALTERNATIVE – STATUS QUO
MIGRATORY BIRDS	No adverse effects are anticipated. A migratory bird protection plan would be implemented. Moderate long-term benefit to colonial bird nesting habitat by increasing nesting opportunities at the dredged materials placement areas.	No effect.
WEST INDIAN MANATEE	Potential adverse impact on the West Indian manatee. These impacts would be adequately minimized through implementation of the manatee conditions outlined in this Environmental Assessment.	Potential continued collision with recreational watercraft within existing channels.
SEA TURTLES	Minor short-term adverse impact on sea turtles in the channel should a hopper dredge be used. This impact would be minimized by the implementation of special conditions such as the use of the deflector draghead inflow screens, and monitoring during operation. Long-term benefit to sea turtle nesting habitat through the placement of material in the nearshore region of Egmont Key.	Long-term decline in sea turtle nesting habitat at Egmont Key due to continued erosion.
PIPING PLOVER	No adverse effects are anticipated. A piping plover protection plan will be implemented.	Long-term decline in piping plover critical habitat at Egmont Key and Longboat Key due to continued erosion.
VEGETATION	No effect.	No adverse effects are anticipated.
HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE	No effect.	No effect anticipated.

ALTERNATIVE ENVIRONMENTAL FACTOR	PREFERRED ALTERNATIVE – HOPPER DREDGE WITH NEARSHORE PLACEMENT AT EGMONT KEY; PREFERRED ALTERNATIVE – CUTTERHEAD DREDGE WITH PLACEMENT ON SHORELINE OF LONGBOAT KEY	NO ACTION ALTERNATIVE – STATUS QUO
NAVIGATION	Dredge barge could temporarily alter navigation patterns during construction. At completion of the project, navigation would be restored without any lasting adverse impacts.	Significant long-term beneficial impact on the navigable capacity of the channel.
ECONOMICS	Significant long-term economic benefit to the northern Sarasota Bay area due to the increased usage by tourists and recreational-use vessels. Minor short-term stimulus to the local economy from the sale of goods and services in support of the dredging.	Moderate long-term adverse impact on the local economy from loss of tourism due to the reduced navigable capacity of the channels.
RECREATION	Moderate long-term beneficial effect from the increased recreational opportunities from access to the immediate commercial area.	Temporary disturbance due to project dredge and construction activities. .
AESTHETICS	No effect.	No effect.

2.7 MITIGATION ANALYSIS

A mitigation proposal has been developed in coordination with NMFS and FDEP to address 0.34 acres of direct and indirect impact on seagrass within and adjacent to the Federal channel that would occur as a result of the proposed maintenance action in November 2011. While specific information is forthcoming, a general description of the plan is as follows:

Through a partnership with the Hillsborough County Conservation Service, candidate site selection will include injury prop scar or blow-out sites from vessel contact with seagrass colonies on the substrate. The Uniform Mitigation Assessment Method (UMAM) was performed for determination of the compensation required to fully address the impact to seagrass resources within the project area. The finding of the assessment

determined that 0.65 acres of restoration is required. The mitigation plan included in Appendix H is being submitted to the Florida Department of Environmental Protection (FDEP). The mitigation measures to compensate for the loss of seagrass will include restoration of seagrass colonies within the injury site(s) with the aid of sediment placement and stabilization to encourage natural recruitment of seagrass reestablishment. Monitoring of the mitigation area will occur for at least three years on a pre-authorized schedule that is acceptable to all stakeholders. In the event that monitoring determines success criteria are not being met or are delinquent in reaching the mitigation plan's goal, a contingency plan, including physical planting, will be implemented.

3 AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This section describes the existing environmental resources of the areas that would be affected if any of the alternatives are implemented. It describes only those environmental resources that are relevant to the decision to be made. It does not describe the entire existing environment, but only those resources that could be affected by the alternatives if they were implemented. This section, in conjunction with the description of the "No Action" alternative, forms the baseline conditions for determining the environmental impacts of Preferred Alternative – Hopper Dredge, Preferred Alternative – Cutterhead Dredge, and the No Action Alternative.

3.2 GENERAL ENVIRONMENTAL SETTING

Sarasota Bay, a coastal lagoon located in southwest Florida, stretches from Anna Maria Sound at the northern end to Venice Inlet at the bay's south end. Its unique ecological character includes small tributaries, coves and inlets. Sarasota Bay is approximately 56 miles long, and was identified as an Estuary of National Significance in 1987 by the US Congress (2006, SBEP). It was formally designated as a National Estuary Program estuary in 1989. More than 1,400 different native species of plants and animals, as well as 500,000 people reside in the Sarasota Bay area. Within the past 50 years, human activities have resulted in a slow but steady decline in the general ecological health of Sarasota Bay (SBEP, 2006).

The shoreline along Sarasota Bay has been partially developed by residential and public land uses including a substantial amount of shoreline that is publicly owned and dedicated open space for recreation and wildlife usage. The climate is subtropical and greatly influenced by the proximity of the Gulf of Mexico. Annual precipitation averages approximately 60 inches per year on Longboat Key and Anna Maria Island, with a

recorded extreme temperature approximately 96° Fahrenheit (F), an extreme minimum temperature of 38° F, and an average temperature of 81 degrees F (SBEP, 2006).

Sarasota Bay supports a wide variety of aquatic life, including species of fin fish, invertebrates, and shrimp for food and bait. Species typically found in Sarasota Bay include: red and black drum, mullet, bluefish, Florida pompano, striped bass, greater amberjack, sheepshead, and various snapper, flounder, grouper and mackerel. Also, dolphin, skates, rays and sharks are frequently sighted in the bay (Sarasota County Water Atlas, USF 2011).

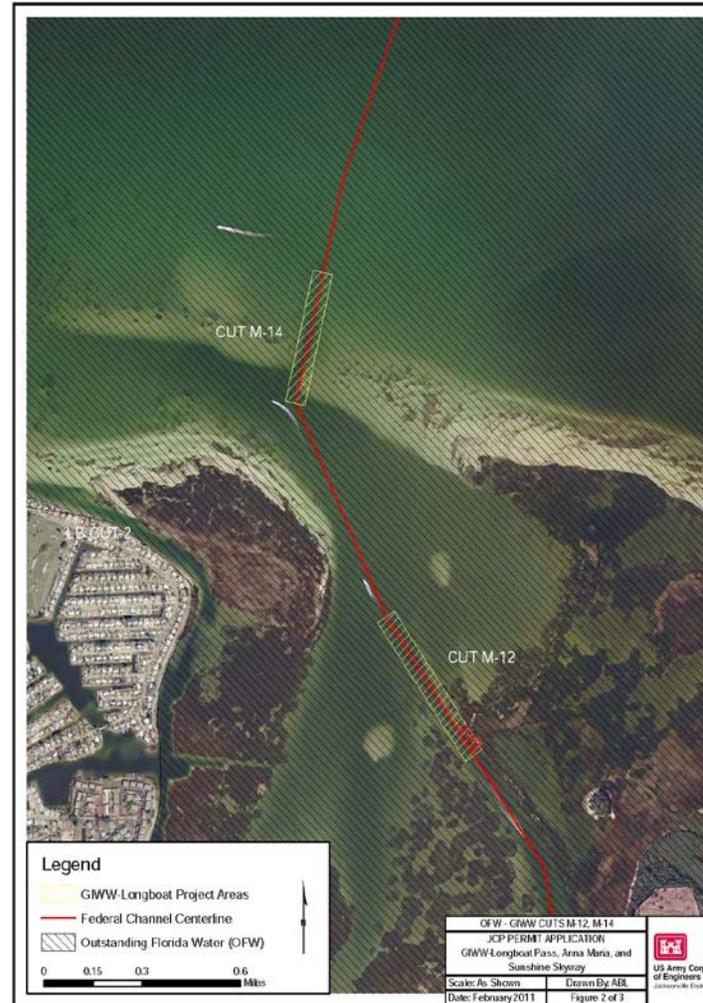
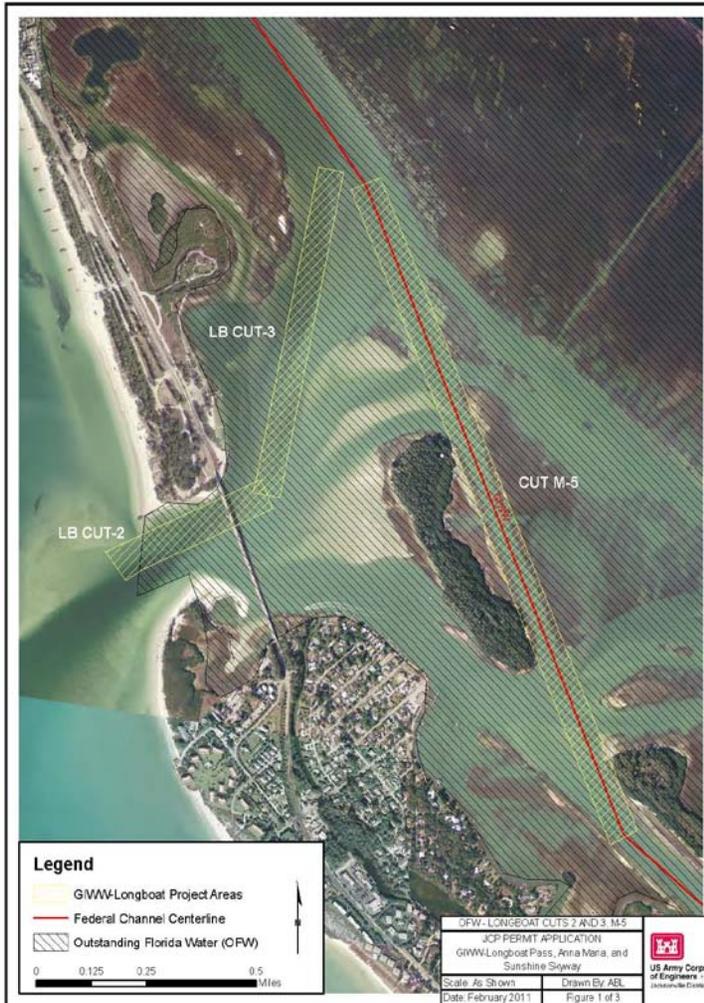
Egmont Key is located at the mouth of Tampa Bay in Hillsborough County, and is a unique and valuable historical, environmental, educational, and recreational resource. The area has experienced moderate to severe beach erosion that has severely damaged the sand dune system. Shoreline erosion has also resulted in damage to historic structures and gravesites on the island.

The FWS owns the southern two-thirds of Egmont Key, and established the Egmont Key National Wildlife Refuge (NWR) as a sanctuary for nesting birds in 1974. There is limited public access to the NWR (USFWS website, 2011). A portion of these lands is managed by the State of Florida as a state park. The northern tip of the island belongs to the U.S. Coast Guard and contains the lighthouse and associated buildings. The Tampa Bay Pilot's Association owns a five-acre parcel on the Tampa Bay side of Egmont Key. Egmont Key supports the largest concentration of gopher tortoises and box turtles in Florida. The south end of the island is a nesting bird sanctuary where access is currently limited. A program is currently being implemented to eradicate nuisance exotic plants, including Brazilian pepper and Australian pine.

FDEP classifies the waters of Sarasota Bay and Tampa Bay surrounding Manatee and Hillsborough Counties as Outstanding Florida Waters (OFW), and portions of GIWW that include Cuts M-5, M-12 and M-14, as well as Longboat Pass Cut 3 are located with the Sarasota Bay Aquatic Preserve (see **Figure 6**). In general, certain waters have an OFW designation because managing agencies requested special protection. In addition, any waterbody demonstrated to be of exceptional recreational or ecological significance may be designated as a "special water" OFW. (FDEP website, 2011).

FDEP defines "Aquatic Preserve" as an exceptional area of submerged lands and its associated waters which are set aside for being maintained essentially in its natural or existing condition" (Ch. 258.35 through 258.46 (1) Florida Administrative Code (FAC)). The project area lies outside of a state designated Aquatic Preserve. Furthermore, Ch. 258.40 (2) (Scope of Preserves) of FAC states "Any publicly owned and maintained navigational channel or other public works project authorized by the United States Congress that is designed to improve or maintain commerce and navigation, shall be deemed excluded from the aquatic preserves established under this act" (FDEP website, 2011)

Figure 5. Outstanding Florida Waters (OFW) in Manatee County are represented by cross-hatch pattern.



3.3 ENVIRONMENTAL FACTORS THAT WOULD BE AFFECTED

3.3.1 WATER QUALITY

Sarasota Bay, at the location of Anna Maria Island and Longboat Key, has a Surface Water Quality Classification of Class II pursuant to rule 62-304(12)(b) (FAC). This classification also applies to Egmont Key. A Class II waterbody is defined as having sufficient water quality for shellfish propagation or harvesting. However, waters within Sarasota Bay, including the project area, are also identified as impaired. Water bodies that do not meet water quality standards are identified as "impaired" for the particular pollutants of concern (nutrients, bacteria, mercury, etc.) and Total Maximum Daily Loads (TMDLs) must be developed, adopted and implemented to reduce pollutants and clean up the water body. A TMDL is the maximum loading of a particular pollutant that can be discharged in a surface water and still meet its designated uses and applicable water quality standards (Manatee County Water Atlas, website, 2011). For Sarasota Bay, the impairment causing the degradation in water quality is identified as nutrients, which are among the leading source of degradation of Florida water resources (SBEP, State of the Bay, 2006).

The trophic, or changing, state of a waterbody has a direct relation to nutrients. The trophic state index takes into account chlorophyll, nitrogen and phosphorus, the nutrients required by plant life. As of December 12, 2010, the overall trophic index was 27, which is rated in the "good" category (0 to 49), according to the Manatee County Water Atlas. This rating has a qualitative trophic state classification of Oligotrophic (defined as a waterbody with low ecological productivity), through Mid-Eutrophic (waterbody having moderate productivity). With respect to individual components of the trophic index, total nitrogen found in surface water samples collected on December 12, 2010 from nearby Palm Sola Bay were found to contain 310 ug/L (micrograms per liter, or parts per billion, ppb), which is considered of moderate quality. The highest level occurred in 2001, and was >2000 ug/L, indicating degraded quality, whereas the lowest level occurred in 2007 and was 200 ug/L, of highest quality. Total phosphorus was determined to have a normal range between 200 ug/L to 500 ug/L from 2008 to 2010, although a one-time event showed a spike of >1000 ug/L. As of December 8, 2010, total phosphorus was considered optimal at its lowest level of 0.1 ug/L. Finally, water clarity is a measure of the degree at which light is blocked due to cloudiness from suspended solids. On December 8, 2010, the surface water had clear visibility to 8.2 feet. Historically, the range has been from less than one foot to greater than 17 feet. Turbidity was measured on this same date at 1.9 NTU (Manatee County Water Atlas, website, 2011).

3.3.2 SEDIMENT ANALYSIS

A total of fifteen borings have been performed with each approximately 1,000 feet apart in the proposed dredging areas in the GIWW channel. The locations of the vibracore borings are depicted on the drawings included in the Geo-tech analysis report of

Appendix G. The sediment encountered within the proposed dredging depth consists of poorly graded sands, and sands containing silt that include trace to some shell fragments. Material consisting of fine- grained silty sands was only encountered in the overdepth of GIWW Cuts M-5 and M-12 at an elevation of -9.9 feet mean lower low water (MLLW).

3.3.3 BIOLOGICAL RESOURCES

The presence of wildlife in the area is limited and dependent on human interaction and vegetative cover. Residential and/or commercial development has altered the original vegetation composition of the shoreline of Longboat Key, Anna Maria Island, and Jewfish Key in the immediate vicinity of the Federal Channel, which in turn has limited the habitat capacity of the shoreline.

3.3.3.1 Vegetation

Coastal vegetation typically inhabits the adjacent dunes and beach along Longboat Key, Jewfish Key and Anna Maria Island. This vegetation includes such species as sea oats (*Uniola paniculata*), sand spur (*Cenchrus spiniflex*), beach sunflower (*Helianthus debilis*), sea grape (*Coccoloba uvifera*), and sea oxeye daisy (*Borrchia frutescens*). Vegetation along the shoreline of the Federal channel along Sarasota Bay of the GIWW is limited in abundance of coverage and quality. Species consists predominantly of trees and shrubs immediately adjacent to the water's edge which include the invasive species Australian pine (*Causarina equisetifolia*), and native species of saltbush (*Bachcharis halmifolia*), and saw palmetto (*Serenoa repens*). Scattered red mangrove (*Rhizophorus mangle*) is present along the shoreline edge of Jewfish Key.

3.3.4 WILDLIFE RESOURCES

3.3.4.1 Marine Mammals

Sarasota Bay and Tampa Bay are within the range of the Florida sub-species of the West Indian manatee (*Trichechus manatus latirostris*) and up to 28 cetacean species, with bottlenose dolphin being most common. The project is not located in an Important Manatee Area (IMA) as designated by FWS, nor in an area designated as critical habitat for manatee. However, a designated Manatee Protection Area encompasses portions of the project area within Sarasota Bay (see **Figure 6**, and accompanying description of manatee in section 3.3.5.1 for Threatened and Endangered Species).

As previously stated, the most common cetaceans is the bottlenose dolphin, (*Tursiops truncatus*). Bottlenose dolphins have robust bodies that typically reach 6 to 12 feet as adults. They feed on fish such as mullet and sheephead, along with marine invertebrates. They live up to 50+ years, and have weights between 140 kilograms and 650 kilograms. Bottlenose dolphins frequent both inshore and offshore marine waters along temperate and tropical coasts. Inshore dolphins live in small social groups of up

to 10 individuals, and are frequently sighted in Sarasota Bay at the Longboat Pass inlet. They are highly intelligent and have complex socialization and communication skills. Dolphins along the coast of Florida are protected by Federal law against harassment under the Marine Mammal Protection Act (MMPA) of 1972. (FWC, NMFS, websites Factsheet).

3.3.4.2 Migratory Birds

The northern end of Sarasota Bay, which includes the immediate project area, contains a known colonial shorebird nesting site within a mangrove community along the shoreline. This is due to the adjacent natural areas providing an abundance of habitat for nesting, foraging, breeding, and roosting. Additionally, Egmont Key is also a designated critical habitat area for piping plover, a federally protected species under the Endangered Species Act (ESA) (see **Figure 7**, Section 3.3.5.3). Rookery habitat for wading birds and the federally threatened wood stork are present adjacent to Egmont Key.

A total of 126 species of birds are associated with marine habitats in Tampa Bay and Sarasota Bay region (Audubon Society of Florida, Manatee County Chapter, 2010). According to the Florida Audubon Society and the Florida Fish and Wildlife Conservation Commission (FWC), both natural or created islands in Sarasota Bay and Tampa Bay serve as important breeding areas for migratory birds due to the suitable substrate and vegetative conditions, and to the absence of humans. With appropriate management, these areas will continue to serve as breeding grounds for a myriad of species.

The following avian species are known or suspected to utilize or occur in the project area:

American Oystercatcher (*Haematopus palliatus*)
Black Skimmer (*Rynchops niger*)
Black-crowned Night Heron (*Nycticorax nycticorax*)
Black-Necked Stilt (*Himantopus mexicanus*)
Brown Pelican (*Pelecanus occidentalis*)
Caspian Tern (*Sterna caspia*)
Cormorant (*Phalacrocorax auritus*)
Glossy Ibis (*Plegadis falcinellus*)
Great Blue Heron (*Ardea herodias*)
Great Egret (*Casmerodius albus*)
Laughing Gull (*Larus atricilla*)
Little Blue Heron (*Egretta caerulea*)
Osprey (*Pandion haliaetus*)
*Piping Plover (*Charadrius melodus*)
Reddish Egret (*Egretta rufescens*)
Ring-Billed Gull (*Larus delawarensis*)

Roseate Spoonbill (*Ajaia ajaja*)
Royal Tern (*Thalasseus maxima*)
Ruddy Turnstone (*Ironware interpret*)
Sandwich Tern (*Sterna sandricensis*)
Snowy Egret (*Egretta thula*)
Tricolored Egret (*Egretta tricolor*)
White Ibis (*Eudocimus albus*)
Willet (*Catoptrophorus semipalmatus*)
*Wood Stork (*Mycteria Americana*)
Yellow-Crowned Night Heron (*Nycticorax violaceus*)

* Denotes federally protected species under the ESA

3.3.5 THREATENED AND ENDANGERED SPECIES

Seven threatened and endangered species listed under the ESA are known or are believed to occur in the project area. These include the West Indian manatee, the wood stork, and the piping plover. Furthermore, four species of sea turtle and the hawksbill (*Eretmochelys imbricata*) utilize the aquatic habitat within the project area.

3.3.5.1 Manatee

The Florida manatee is federally listed as an endangered species under the ESA (32 FR 4001) and the species is further protected as a depleted stock under the MMPA. Florida manatee, a subspecies of the West Indian manatee (Domning and Hayek, 1986), live in freshwater, brackish, and marine habitats in coastal and inland waterways of the southeastern United States. The majority of the population can be found in Florida waters throughout the year, and nearly all manatees use the waters of peninsular Florida during the winter months. The manatee is a cold-intolerant species and requires warm water temperatures generally above 20/ Celsius (68/ Fahrenheit) to survive during periods of cold weather. During the winter months, manatees rely on warm water from industrial discharges and natural springs for warmth. In warmer months, they expand their range and occasionally are seen as far north as Rhode Island on the Atlantic Coast and as far west as Texas on the Gulf Coast FWS.

Manatees inhabit both fresh and saltwater and may be encountered in canals, rivers, estuaries, bays, and on rare occasion have been observed as far as 6 km off the Florida Gulf coast 2007. Surveys show that over 900 manatees inhabit the west coast of Florida. The highest concentrations of manatees along Florida's Gulf coast exist in Citrus, Levy, Lee, and Collier Counties. They are especially known to congregate around areas of high seagrass population and warm water outfalls associated with manufacturing and power generation (USFWS, 2007). Data suggest that of the manatees living in the Sarasota Bay area, most occur within the Bay where seagrass colonies are prevalent and stable.

From January, 2001 to February, 2010, seventy-six (76) manatee mortalities were documented in Manatee County (FWRI, 2010). The leading cause of mortality is due to watercraft (29%), followed by cold stress (18%). Natural or undetermined cause of death totaled 17% for the same time period. Human or other causes resulted in the least number of deaths (<3%), and no deaths related to gate or lock systems occurred in Manatee County over this 9 year period (FWRI, 2010). Between January, 2010 and 17 December, 2010, fourteen (14) manatee deaths occurred in Manatee County. Six of these mortalities occurred due to cold stress; four are directly related to collision with watercraft, and four others are of undetermined origin. (FWC, 2010).

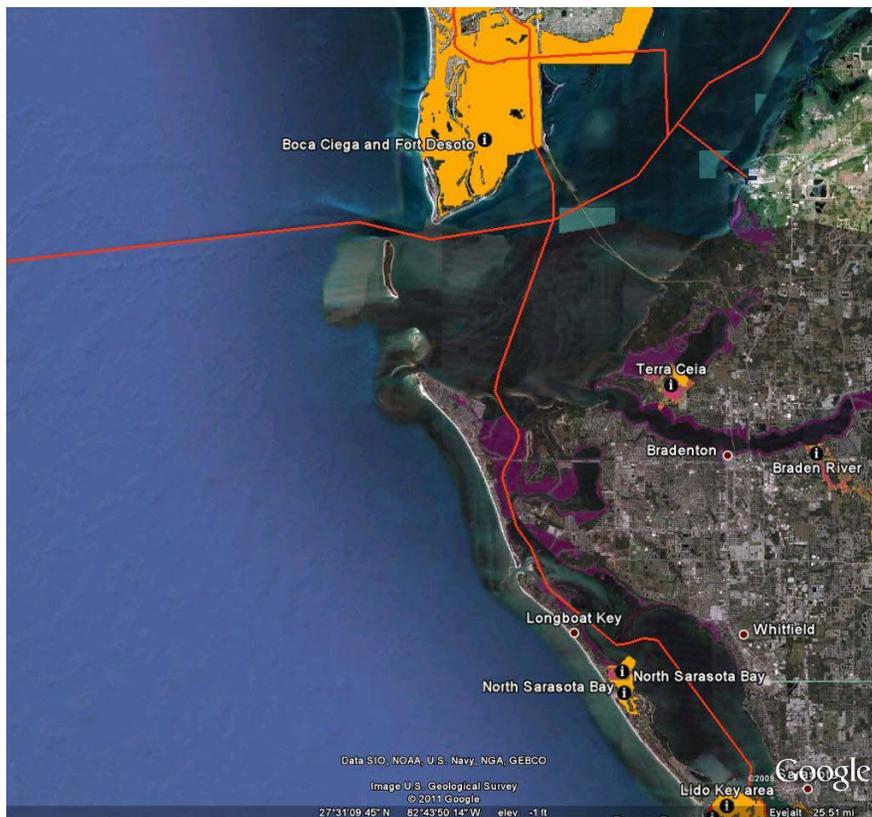


Figure 6: Locations of IMAs (yellow) and Manatee Protection Area (purple) in relation to the Federal Channel (red). No IMAs are within the project area. Manatee protection areas have designated no-wake zones for boat usage at idle speed, slow speed, or limit of 25 mph all year.

3.3.5.2 Sea Turtles

Four species of sea turtles are known to occur within the area around Manatee and Hillsborough Counties. These are the loggerhead (*Caretta caretta*), green (*Chelonia mydas*), Kemp's ridley (*Lepidochelys kempii*), and the hawksbill (*Eretmochelys imbricata*) (Meylan, et al., 1999; EPA, 1981). The loggerhead is listed as threatened and the other three species are listed as endangered under the ESA. Loggerhead turtles are

the most abundant sea turtles present in Sarasota Bay. They are the most common species nesting at Anna Maria Island, Longboat Key, and Egmont Key.

From 2005 to 2009, between 73 to 161 loggerhead sea turtle nests were observed on the Gulf coast shoreline of Anna Maria Island and northern Longboat Key (FWC/FWRI Statewide Nesting Beach Survey Program, 2010). In comparison, between 35 to 125 loggerhead sea turtle nests have been recorded on Egmont Key. No other species of sea turtle have been reported nesting on Egmont Key.

3.3.5.3 Piping Plover

The southern tip of Egmont Key is a known colonial shorebird nesting site. In addition to migratory birds that nest on Egmont Key, the island is designated as critical habitat for the piping plover (Unit FL-21; Figure 10). This type of island is typically used by piping plover as wintering habitat. They stay at these sites and forage for food before traveling back to their nesting and breeding grounds in the north for the summer.

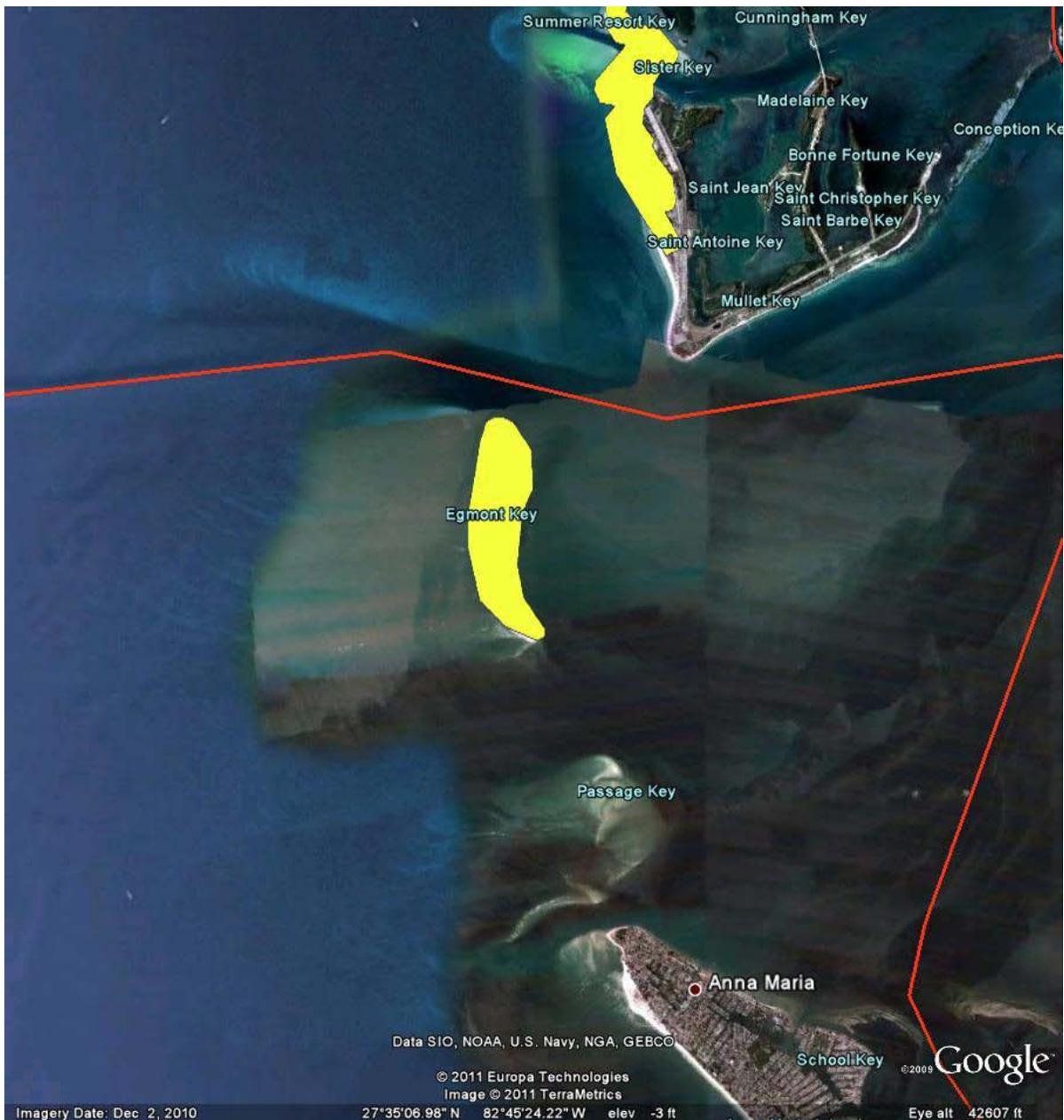


Figure 7: Location of piping plover critical habitat designated by the U.S. Fish and Wildlife Service. Critical habitat is shown in yellow, and includes all of Egmont Key.

3.3.5.4 Wood Stork

Wood storks utilize the areas adjacent to the Federal channels for loafing and foraging. According to the Audubon Society of Florida, this endangered species nests in only one coastal colony in Tampa/Sarasota Bay region, the Dot-Dash colony at the mouth of the Braden River. This nesting location is a FDEP identified active colony (ID No. 615113), and is approximately 11 miles from the project area in the Manatee River watershed north of downtown Bradenton. About 100 pairs nest annually, with 140 in 2000. In 1994 the colony was abandoned, reportedly due to disturbance by personal watercraft.

3.3.6 SEAGRASS

Seagrass beds are important resources as they offer habitat to several fish species (red drum, spotted sea trout, spot, silver perch, sheepshead, and snook), invertebrates, algae, dolphin, and the manatee. Sarasota Bay contains an abundance of seagrass habitat, especially in the region of the project site. Light penetration from the surface to the substrate may extend up to 9.5 feet due to optimal water clarity from the lack of turbidity in this region. Also, the barrier of Longboat Key and Anna Maria Island protect Sarasota Bay by providing low wave action which also encourages the growth of seagrass.

Three species of seagrass, turtle grass (*Thalassia testudinum*), shoal grass (*Halophila wrightii*), and manatee grass (*Syngodium filiforme*), are found throughout the project area, including the GIWW and Longboat Pass cuts. The 300 foot study corridor consists of the 100 foot Federal Channel, and two 100 foot buffers on either side of the channel. Although a minor amount of seagrass (0.33 ac) occurs within the existing Federal channel, most concentrations of seagrass were found in the shallow areas immediately buffering the channel edges outside of the proposed dredge areas. Seagrass beds are present within and adjacent to the navigation channel of Cut M-5 immediately near Jewfish Key (**Figure 8**), as well as one minimal-sized colony within Cut M-14, (**Figure 9**). Cut M-12 does not contain any seagrass within the proposed dredge area; however, seagrass colonies are located immediately adjacent to the channel. A total of 0.33 acre of seagrass occurs within the proposed dredge area of GIWW Cuts M-5 and M-14. No seagrass occurs in proposed dredge area of Longboat Pass LB-2 or LB-3, although a very small colony is located immediately adjacent to the proposed dredge channel of LB-3.

Table 3, below, summarizes the findings of the seagrass survey completed in September, 2010, by Dial Cordy and Associates in conjunction with this project. The detailed seagrass survey report, including graphic representation of occurrence, is included as Appendix F. Please note the seagrass survey also included two Federal Channels, Sunshine Skyway Pass Cuts 2 and 3, which are the subject of a separate Environmental Assessment.

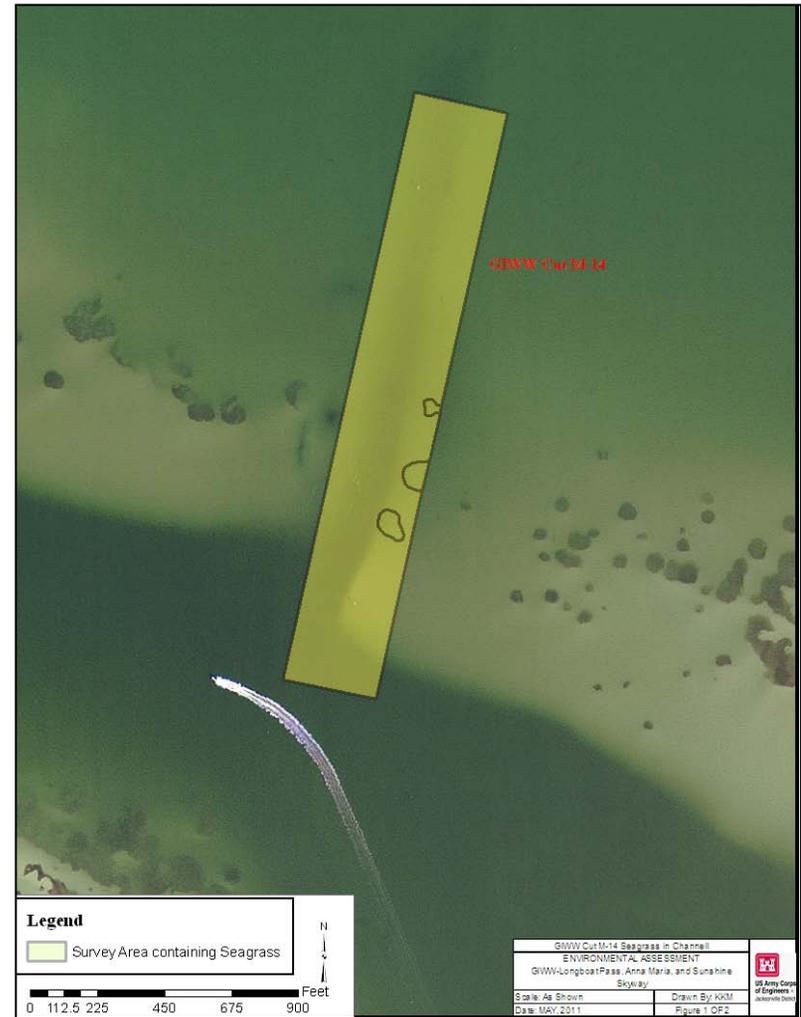
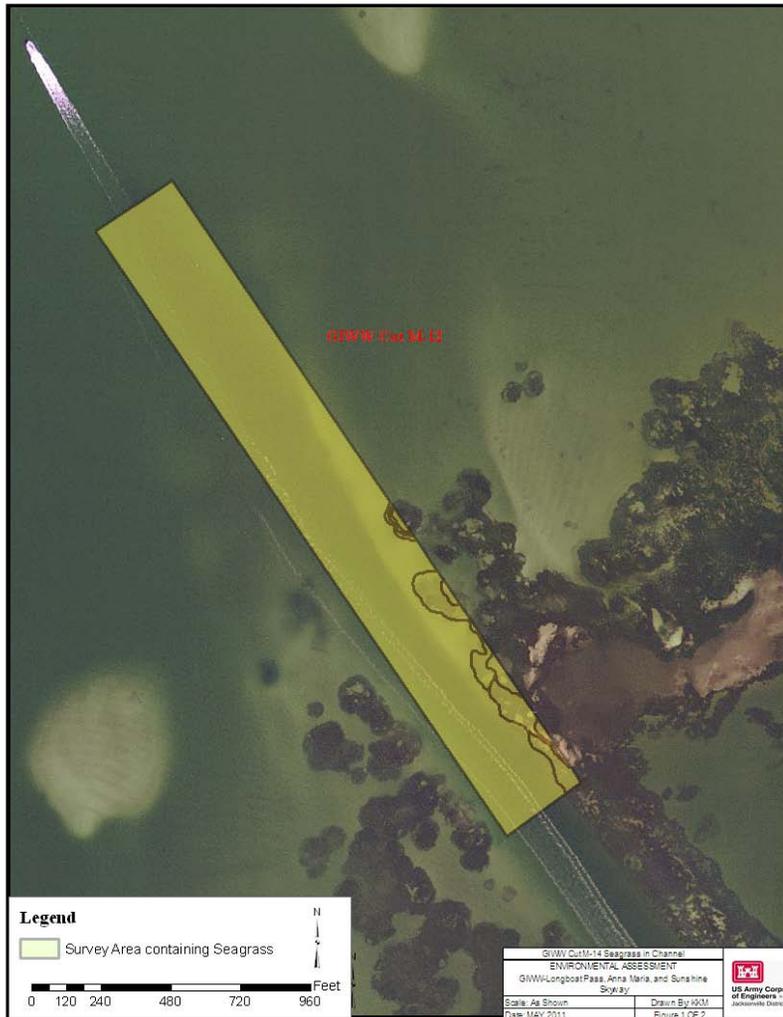
Table 3 Seagrass species and area coverage within the GIWW study area.

Location	Community	Acres
GIWW M-5	<i>H. wrightii</i>	3.442
	<i>H. wrightii, S filiforme</i>	0.374
	<i>S. filiforme</i>	4.432
	<i>H. wrightii, S. filiforme, T. testudinum</i>	0.034
	<i>H. wrightii, T. testudinum</i>	1.480
	<i>S. filiforme , T. testudinum</i>	4.825
	<i>T. testudinum</i>	0.421
	Exposed Rock Ledge	0.153
	GIWW M-12	<i>H. wrightii</i>
<i>H. wrightii, S. filiforme</i>		0.354
<i>S. filiforme</i>		0.641
<i>S. filiforme, T. testudium</i>		0.216
<i>T. testudium</i>		0.245
GIWW M-14	<i>H. wrightii</i>	0.052
	<i>H. wrightii, S. filiforme</i>	0.145
	<i>T. testudium</i>	0.140
GIWW SC-2	Unvegetated Sandy substrate	
GIWW SC-3	<i>H. wrightii, S. filiforme</i>	0.145
	<i>T. testudium</i>	0.140
	<i>H. wrightii</i>	0.052
LB- Cut-2	Unvegetated Sandy substrate	
LB- Cut-3	<i>H wrightii, S filiforme</i>	0.089
	<i>S. filiforme. T. testudinum</i>	0.055

Figure 8: Locations where seagrass occurs within GIWW Cut M-5 and immediate buffer



Figure 9: Locations where seagrass occurs within immediate buffer to GIWW Cuts M-12 and M-14



3.4 ESSENTIAL FISH HABITAT DESCRIPTION (EFH)

Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) (16 U.S.C. 1801-1882) requires identification of habitats needed to support sustainable fisheries and comprehensive fishery management plans with habitat inclusions. The Act also requires preparation of an Essential Fish Habitat (EFH) assessment and coordination with NMFS when adverse impacts to EFH are likely to occur.

EFH is defined in the MSFCMA as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." For interpreting the definition of EFH, "waters" include aquatic areas and their associated physical, chemical, and biological properties used by fish, and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

The Gulf of Mexico Fisheries Management Council (GMFMC, 1998) has designated non-vegetated bottom and water column zones within the project area as EFH in compliance with the MSFCMA. A summary of that assessment is included here. Managed species that commonly inhabit the project area are shown in **Table 4**.

Table 4. Managed species commonly occurring in the project area

Common Name	Scientific Name
Stone Crab	<i>Menippe mercinaria</i>
Spanish Mackerel	<i>Scomberomorus maculatus</i>
Red Drum	<i>Sciaenops ocellatus</i>
Pink Shrimp	<i>Penaeus duorarum</i>

Source: Gulf of Mexico Fisheries Management Council 1999

The Gulf of Mexico in this region also provides essential forage, cover, and nursery habitats for other species that are important commercially and recreationally. These species include the blue crab (*Callinectes sapidus*), flounder (*Syacium spp.*), and mullet (*Mugil spp.*). A summary of managed species and their seasonal occurrence within the area is shown in **Table 5**.

Table 5 Species managed by the Gulf of Mexico Fishery Management Council.

Species	Seasonal Occurrence In Tampa Bay	Habitat Affinity
Pink Shrimp (<i>Penaeus duorarum</i>)	Adults- Rare from November-June Juvenile- Highly Abundant Year Round	Soft Bottom
Stone Crab (<i>Menippe mercinaria</i>)	Common Year Round	Soft Bottom
Gag (<i>Mycteroperca microlepis</i>)	Juvenile- Year Round	Hard Bottom
Scamp (<i>Mycteroperca phenax</i>)	Year Round	Hard Bottom
Red Drum (<i>Sciaenops ocellatus</i>)	Adults-Common Year Round Juvenile-Common to Abundant Year Round	Soft Bottom
Spanish Mackerel (<i>Scomberomorus maculatus</i>)	Adults-Common Year Round Juveniles-Rare Year Round	Water Column
Spiny Lobster (<i>Panulirus argus</i>)	Rare Year Round	Hard Bottom
Lane Snapper (<i>Lutianus synagris</i>)	Juvenile-Year Round	Hard Bottom
Yellowtail Snapper (<i>Ocyurus chrysurus</i>)	Juvenile-Year Round	Hard Bottom
Goliath Grouper (<i>Epinephelus itaiara</i>)	Juvenile-November to January	Hard Bottom

Source: Gulf of Mexico Fisheries Management Council 1999

3.5 CULTURAL RESOURCES

Florida has been inhabited for at least the last 10,000 years, first by Native Americans and then Europeans beginning in the 16th century. The potential exists for both prehistoric and historic cultural resources to occur within the project area. Prehistoric Native American sites are recorded along the shore of the GIWW project area that date from 10,000 YBP (years before present) to 1,500 AD. Submerged prehistoric sites have also been identified within Tampa Bay, resulting from gradual sea level rise that occurred from about 10,000 years ago to 6,000 years ago. At that time, the continental shelves were exposed, and an area almost twice the width of the current size of the state was available for habitation by Native Americans.

The Gulf coast of Florida has been explored by warships, trading vessels, submarines and pleasure craft since the Age of Exploration until the present. Many shipwrecks are

recorded in the vicinity of the project area. *The Regina*, a 20th century shipwreck, lies just offshore of the project area in the Gulf of Mexico. The waters of Tampa Bay and Egmont Key contain 19th and 20th century recorded shipwrecks, including the *USS Narcissus*, a Civil War vessel.

GIWW Federal channel project area

No historic properties are recorded within the GIWW Federal channel project area by the Florida Master Site File (FMSF). No previous submerged remote sensing cultural resource surveys have been conducted in the GIWW channel project area. However, there are known historic properties that exist within the vicinity of the Federal channel project area and near the sand placement area adjacent to Egmont Key.

Egmont Key nearshore sand placement area

Historic properties are located along the western side of historic Egmont Key, which is listed on the National Register of Historic Places (8HI117) and is potentially eligible as a National Land Mark (James et al. 2006). Egmont Key was listed on the National Register on December 11, 1979. The island has long been used by the U.S. Government for both national defense and as an aid to navigation. In 2004, the State Historic Preservation Officer (SHPO) noted that the “cultural resources of Egmont Key are being adversely affected by erosive storm surges and high tides (DHR No: 2004-7106).” Features associated with various forts on the island, such as batteries, target ranges, and a small section of railway, have eroded into the water. While these features are outside of the boundaries of the National Register property, they are directly associated with historic Egmont Key. As such, the materials should be considered as part of the property listed on the National Register (James et al 2006; Laura Kammerer, Deputy SHPO, personal communication).

3.6 NOISE

Noise in this area of Sarasota Bay is typically limited to that of vessels utilizing the navigational channel in transit from the Gulf of Mexico to Sarasota Bay, the Manatee River and Tampa Bay. Recreational boaters and personal watercraft contribute minimally to the amount of noise in the area.

3.7 SAFETY

The channel was designed and authorized for a specific depth and width. Over time, shoaling occurs and reduces the navigable capacity of the channel. If the channel is not adequately maintained, the use of the channel becomes a safety hazard for vessels. The US Coast Guard is authorized to prohibit the use of channels that pose a safety hazard for vessels.

3.8 RECREATION

Both Manatee and Hillsborough Counties are heavily populated areas along Florida's Gulf Coast. This region also experiences a large volume of tourists, particularly during the winter months. Sarasota Bay provides area citizens and visiting tourists with recreational opportunities that include boating, canoeing, kayaking, fishing, swimming, and educating citizens on the environment. The majority of Egmont Key is owned by the Department of Interior, but it is leased to the State of Florida and has been designated as the Egmont Key State Recreation Area. The facility has numerous historic military batteries, and the beach is a popular recreation site when erosion does not prevent its use by beachgoers.

3.9 NAVIGATION

The navigation channel allows for the transportation of recreational and commercial sport fishing to and from Sarasota Bay and Tampa Bay. This channel provides long-term economic stimulus to the economy of the Bradenton, Sarasota, and Tampa metropolitan areas and the generation of revenues from the sale of goods and services to the public.

3.10 ECONOMICS

In the 1890's, initial dredging of a channel for the use of commercial shipping was authorized by Congress for a 5 by 100-foot channel from Tampa Bay to Sarasota. The purpose for the channel was for shipping of goods and merchandise. The channel was deepened and widened to its current configuration under authorization of Congress in 1935 as a component of the GIWW (Alperin, 1983). Although Sarasota was not destined to become a commercial shipping port, the GIWW has become an important navigable channel for recreational boating, commercial sport-fishing, excursion boats, and general tourism (SBEP, 2006).

Major land uses in the project area include residential, commercial, and public parks. Numerous marinas occupy the landscape of the waterway along the shoreline of the Federal project area. Continued channel maintenance benefits the local economy by accommodating increased traffic along the waterway which contributes additional commerce to local communities.

4 ENVIRONMENTAL EFFECTS

4.1 INTRODUCTION

This section describes the potential consequences of implementing the Preferred Alternatives (Hopper Dredge and Cutterhead Dredge), or the No Action Alternative on selected environmental resources. These resources are directly linked to the issues identified in Section 3 that have driven and focused the environmental analysis. This section summarizes the changes that may occur to the existing environment including the direct, indirect, and cumulative impacts. Cumulative impact is the “impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions” (40 CFR § 1508.7).

Any irreversible or irretrievable commitments of resources are also discussed in this section. An irreversible commitment of resources is one in which the ability to use and/or enjoy the resource is lost forever, such as the mining of a mineral resource. An irretrievable commitment of resources is when opportunities to use or enjoy the resource as they presently exist are lost for a period of time due to decisions to manage the resource for another purpose. An example of an irretrievable loss might be where a type of vegetation is lost due to road construction.

This section compares the effects and commitments of resources for both the No Action Alternative and the Preferred Alternative(s).

4.2 WATER QUALITY

4.2.1 PREFERRED ALTERNATIVE – HOPPER DREDGE

Dredging operations would produce temporary minor changes in water quality. Turbidity levels in the areas of dredging would be elevated above normal during dredging within the mixing zone. Visible plumes at the water surface are expected in the immediate vicinity of the dredging operation. Elevated turbidity levels are expected to dissipate rapidly, returning to background levels in a short period of time. Temporary minor elevations in turbidity levels will be experienced from the return water from the disposal site.

Local conservation interests have raised concern recently about high levels of nitrogen in the Sarasota Bay sediments. Also, there is some tentative scientific agreement with this concern. This alternative may cause these nutrients to temporarily re-suspend in the water column. Studies suggest that excessive nutrients in the water column could stimulate plankton growth, shading out seagrass.

The increase in turbidity levels and the potential stimulation of plankton growth in the water column may result in temporary declines in water quality. Turbidity levels may increase in the nearshore area along Egmont Key during dredge material placement. No long-term adverse impact on water quality is expected to occur as a result of Preferred Alternative – Hopper Dredge.

4.2.2 PREFERRED ALTERNATIVE – CUTTERHEAD DREDGE

Temporary impact to water quality would be similar to that described in Preferred Alternative – Hopper Dredge. In addition, a pipeline discharge of dredged materials would have temporary impact of increased turbidity from suspension of solids along the shoreline of Longboat Key in the area of material placement. Upon completion of the project, water quality is expected to return to background conditions within a short time period.

4.2.3 NO ACTION ALTERNATIVE

Boats moored in or traveling through the project area could disturb the sediments that have accumulated in the shoals with anchors or propellers, potentially causing a perpetual increase in local turbidity levels.

4.3 HISTORIC PROPERTIES

4.3.1 PREFERRED ALTERNATIVE – HOPPER DREDGE

GIWW Federal channel project area

A submerged remote sensing cultural resources survey, *Cultural Remote Sensing Survey of the Gulf Intracoastal Waterway, Manatee, Pinellas, and Hillsborough Counties, Florida*, located fourteen potentially significant targets (historic properties) within and immediately adjacent to the GIWW channel project area (SEARCH, 2011).

Subsequent diver identification of these targets by the Corps resulted in the report, *Diver Identification of Fourteen Targets in the Gulf Intracoastal Waterway, Manatee, Pinellas, and Hillsborough Counties, Florida* (PCI, 2011). None of these targets were found to represent historic properties. The Corps has determined that there will be no historic properties affected by dredging impacts, including drag arm, spudding (anchoring) and sand placement operations.

Egmont Key nearshore material placement area

Because unrecorded historic properties located within the sand placement area could be damaged by placement of anchors and sand placement operations associated with nearshore sand placement, a sidescan sonar survey of the nearshore sand placement area west of Egmont Key was conducted by USACE in coordination with the Florida SHPO (personal communication January 24, 2011). This survey did not locate any additional historic properties within the project area. The Corps has determined that there will be no historic properties affected by nearshore sand placement in this area.

Consultation with the Florida SHPO, appropriate federally recognized tribes, and other interested parties is ongoing.

4.3.2 PREFERRED ALTERNATIVE – CUTTERHEAD DREDGE

GIWW Federal channel project area

A submerged remote sensing cultural resources survey, *Cultural Remote Sensing Survey of the Gulf Intracoastal Waterway, Manatee, Pinellas, and Hillsborough Counties, Florida*, located fourteen potentially significant targets (historic properties) within and immediately adjacent to the GIWW channel project area (SEARCH, 2011).

Subsequent diver identification of these targets by the Corps resulted in the report, *Diver Identification of Fourteen Targets in the Gulf Intracoastal Waterway, Manatee, Pinellas, and Hillsborough Counties, Florida* (PCI, 2011). None of these targets were found to represent historic properties. The Corps has determined that there will be no historic properties affected by dredging impacts, including drag arm, spud anchoring and sand placement operations.

Egmont Key nearshore material placement area

Because unrecorded historic properties located within the disposal area could be damaged by placement of anchors and material discharge operations, a sidescan sonar survey of the designated nearshore placement site west of Egmont Key was conducted by Corps in coordination with the Florida SHPO (personal communication January 24, 2011). This survey did not locate any additional historic properties within the project area. Nearshore sand placement in this area will not be an adverse effect to historic properties.

Consultation with the Florida (SHPO) and other interested parties was initiated September 30, 2010. Appropriate Federally recognized tribes were consulted concerning this project in September, 2010 and January, 2011. Consultation with the Florida SHPO, appropriate federally recognized tribes, and other interested parties is ongoing and will continue until completion of the project.

4.3.3 NO ACTION ALTERNATIVE

GIWW Federal channel project area

No effects to known historic properties.

Egmont Key nearshore sand placement area

For Egmont Key, if no nearshore sand placement is conducted, the natural processes currently eroding the island will continue. This will ultimately have an “adverse affect” on the historic properties, as portions of the island’s resources succumb to the erosive forces (DHR no 2004-7026). If sufficient damage occurs to the island and its historic resources, the historic properties could be delisted from the National Register of Historic Places. Archaeological and architectural resources typically do not fare well when exposed to such effects, and ultimately will become damaged. Materials similar to the

concrete batteries that have already eroded into the water will suffer extensive damage. Therefore, the no action alternative also will result in continued adverse affects on the island's historical properties.

4.4 NOISE

4.4.1 PREFERRED ALTERNATIVE – HOPPER DREDGE

There would be relatively no increase in noise levels from dredging in this location as background noise levels from vessel traffic and general public within the area are already moderate. There may be temporary increases in noise levels at the disposal site during the operation of the discharge equipment. Noise levels are expected to return to background levels upon completion of the project.

4.4.2 PREFERRED ALTERNATIVE – CUTTERHEAD DREDGE

Temporary impact on the surrounding community from noise would be similar to that described in Preferred Alternative – Hopper Dredge discussion above.

4.4.3 NO ACTION ALTERNATIVE

No additional noise pollution would result from the No Action Alternative.

4.5 SAFETY

4.5.1 PREFERRED ALTERNATIVE – HOPPER DREDGE

Preferred Alternative – Hopper Dredge will deepen the channel and prevent vessels from grounding on shoals. This alternative will increase overall boater safety by facilitating improved access to Sarasota Bay for all vessels using the Federal navigation channels.

4.5.2 PREFERRED ALTERNATIVE – CUTTERHEAD DREDGE

Preferred Alternative – Cutterhead Dredge will deepen the channel and prevent vessels from grounding on shoals. This alternative will increase overall boater safety by facilitating improved access to Sarasota Bay for all vessels using the Federal navigation channels.

4.5.3 NO ACTION ALTERNATIVE

There would continue to be a long-term adverse effect on safety by vessel groundings from a reduction in the navigable capacity of the channel.

4.6 WILDLIFE RESOURCES

4.6.1 PREFERRED ALTERNATIVE – HOPPER DREDGE

4.6.1.1 Marine Mammals

There would be no expected impact on marine mammals, particularly bottlenose dolphin, as the presence of the continuously moving dredge within the channel should alert any dolphins to the presence of the vessel.

4.6.1.2 Migratory Birds

There would be no impact on migratory bird nesting as the construction is proposed to occur outside of the migratory bird nesting season. However, if work occurs outside of this timeframe, the Jacksonville District's Migratory Bird Protection policy will be implemented. Therefore, it is anticipated this project will have no significant adverse affect to migratory birds.

4.6.1.3 Threatened and Endangered species

4.6.1.3.1 Manatee

Because manatees are documented to occur in Sarasota Bay, they may be temporarily affected by the presence of Preferred Alternative – Hopper Dredge within foraging/migration routes. To insure the protection of manatees present, the standard state and Federal manatee protection conditions would be implemented during construction. Informal consultation under Section 7 of the 1973 Endangered Species Act was initiated by the Corps on March 23, 2011(Appendix E). The US Fish and Wildlife Service (USFWS) Final Statewide Programmatic Biological Opinion (SPBO), (signed April 25, 2011, and revised August 22, 2011), concurred with the Corps determination that the preferred alternative as proposed in this Environmental Assessment may affect, but is not likely to adversely affect the West Indian manatee with the inclusion of the Standard Manatee Construction Conditions (2011). A copy of the August 2, 2011 correspondence from Mr. David Hankla, Field Supervisor, USFWS, is included in Appendix E. The SPBO can be accessed online at the following link under the “beach mouse and sea turtle” heading:

<http://www.fws.gov/northflorida/Tools2Use/consult-landowner-refs.htm>

Therefore, the preferred alternative is not likely to adversely affect the manatee.

4.6.1.3.2 Sea Turtle

Sea turtle activities, including for foraging and migration to nesting sites, could be affected during dredging by a hopper dredge. The hopper dredge will be equipped with draghead deflectors for the intended purpose of sea turtle protection. In addition, all

requirements of the National Marine Fisheries Service (NMFS) Gulf Regional Biological Opinion (GRBO) will be met.

Although sea turtle nesting regularly occurs on Egmont Key, the extensive erosion occurring on the western shoreline of the island is limiting available nesting habitat. The proposed placement of dredged material some 1,500 feet from the western shoreline below mean low water line of Egmont Key will have minimal effect on sea turtle migration utilizing the beach area.

4.6.1.3.3 Piping Plover

The piping plover critical habitat found at Egmont Key is defined as the areas that provide primary constituent elements, including inter-tidal beaches and flats, and associated dune systems and flats at annual high tide. Since the sand placement at Egmont Key will occur in the nearshore below mean lower low water line, the project will not modify piping plover critical habitat.

4.6.1.3.4 Wood Stork

There will be no impact to wood stork as the construction will occur at least 8 miles away from a known active rookery and will not impede their ability to forage, nest, or roost in the adjacent mangrove-dominated habitat area of Sarasota Bay.

4.6.1.4 Seagrass

As a result of the dredging operation, there will be impact on approximately 0.34 acres of seagrass that are present in the navigational channel of GIWW M-5 and Cut M-14. Although the GIWW is a federally operated and maintained navigational channel, the rapid build-up of shoal material in the channel from a prolonged period without maintenance dredging has resulted in colonization by shoal grass (*Halodule wrightii*), manatee grass (*Syringodium filiforme*), and turtle grass (*Thalassia testudinum*). Seagrass that exist in the buffer zone adjacent to the Federal navigational channel may temporarily be impacted by this operation due to potential slumping of side slopes during dredging. However, natural recruitment is expected to reestablish seagrass on the side-slopes post-dredging.

These impacts require mitigation for the permanent and temporal loss of seagrass from both the state and Federal resource agencies. A mitigation plan has been devised that addresses the compensation for permanent and temporal loss of seagrass as a result of this action. The mitigation plan is included in Appendix H of this report.

4.6.2 PREFERRED ALTERNATIVE – CUTTERHEAD DREDGE

4.6.2.1 Marine mammals

Similar to Preferred Alternative – Hopper Dredge, there should be no impact on marine mammals, particularly bottlenose dolphin, as the presence of the cutterhead dredge within the channel should alert them to the presence of the vessel.

4.6.2.2 Migratory Birds

There would be no impact on migratory bird nesting as the construction is proposed to occur outside of the migratory bird nesting season. However, if work occurs outside of this timeframe, the Jacksonville District's Migratory Bird Protection Policy will be implemented. Therefore, it is anticipated this project will have no adverse affect to migratory birds. No piping plover critical habitat found in the proposed placement location of Longboat Key.

4.6.2.3 Threatened and Endangered species

4.6.2.3.1 Manatee

Similar to Preferred Alternative – Hopper Dredge, manatees in Sarasota Bay may be temporarily affected by Preferred Alternative – Cutterhead Dredge by the presence of the cutterhead dredge within foraging migration routes. To insure the protection of those present within the project area, the standard state and Federal manatee protection conditions would be implemented during construction. Informal consultation under Section 7 of the 1973 Endangered Species Act was initiated by the Corps on March 23, 2011 (Appendix E). The US Fish and Wildlife Service (USFWS) Final Statewide Programmatic Biological Opinion (SPBO), signed April 25, 2011 and revised August 22, 2011, concurred with the Corps determination that the preferred alternative as proposed in this Environmental Assessment may affect, but is not likely to adversely affect the West Indian manatee with the inclusion of the Standard Manatee Construction Conditions (2011). A copy of the August 2, 2011 correspondence from Mr. David Hankla, Field Supervisor, USFWS, is included in Appendix E. The SPBO can be accessed at:

<http://www.fws.gov/northflorida/Tools2Use/consult-landowner-refs.htm>

Therefore, the preferred alternative is not likely to adversely affect the manatee.

4.6.2.3.2 Sea Turtles

Sea turtles are not likely to be affected during dredging by a cutterhead dredge, as proposed in Preferred Alternative – Cutterhead Dredge as the presence of the dredge within the channel should alert any sea turtles to the presence of the vessel. In accordance with the NOAA Gulf Regional Biological Opinion, all requirements will be met.

Although sea turtle nesting regularly occurs on the beaches of Longboat Key, erosion occurring on the western shoreline is limiting the habitat available for sea turtle nesting. The proposed deposition of dredged material placement via pipeline discharge along the western shoreline below mean lower low water line of Longboat Key should have no effect on sea turtle migration utilizing the beach area.

4.6.2.3.3 Piping Plover

There will be no impact on piping plover by Preferred Alternative – Cutterhead. The area for proposed placement of dredged material via pipeline discharge along the shoreline of Longboat Key is not identified as being critical habitat for this species.

4.6.2.3.4 Wood Stork

There will be no impact on wood stork as the construction will occur at least 8 miles away from a known active rookery and will not impede their ability to forage, nest, or roost in the adjacent mangrove-dominated habitat area of Sarasota Bay. Wood storks are not known to utilize the shoreline of Longboat Key in the proposed location for dredge material placement.

4.6.2.4 Seagrass

The Preferred Alternative – Cutterhead Dredge would remove material from the same area as Preferred Alternative – Hopper Dredge, and therefore, would have a similar effect on seagrass within the proposed project area as described above in section 4.6.1.4. However, a sub-aquatic resource survey conducted for discharge of dredged materials by cutterhead dredging did not identify the presence of either seagrass or hardbottom resources within the proposed location of the pipeline route or the placement area along the shoreline of Longboat Key. See Appendix F for details regarding the sub-aquatic resource survey.

4.6.3 NO ACTION ALTERNATIVE

4.6.3.1 Marine Mammals

Manatees could become trapped by large vessels passing overhead if the clearance between the channel bottom and vessel hull is not adequately maintained.

4.6.3.2 Migratory Birds

There would be no effect on migratory birds by pursuing the no action alternative.

4.6.3.3 Threatened and Endangered Species

4.6.3.3.1 Manatee

There would be no effect to manatee by pursuing the no action alternative.

4.6.3.3.2 Sea Turtle

There would be no affect on sea turtle by pursuing the no action alternative.

4.6.3.3.3 Piping Plover

There would be no effect on piping plover by pursuing the no action alternative.

4.6.3.3.4 Wood Stork

There would be no effect on wood stork by pursuing the no action alternative.

4.6.3.4 Seagrass

There would be no effect on seagrass colonies present within the Federal navigation channel (presently within GIWW Cut M-5 and M-14) by pursuing the no action alternative.

4.7 ESSENTIAL FISH HABITAT

The project description is found in Section 2.2.1. Section 3.7 describes the “existing conditions” of the Essential Fish Habitat (EFH). This is defined as “federally managed fisheries, and associated species such as major prey species, including affected life history stages”. The following subsections describe the individual and cumulative impacts of the proposed action and alternatives on EFH, Federally managed fisheries, and associated species such as major prey species, including the affected life history stages.

4.7.1 PREFERRED ALTERNATIVE - HOPPER DREDGE

Preferred Alternative – Hopper Dredge would result in short-term impacts on benthic organisms and any larval-staged organisms present in the sediment removed from the channel, or in the dredge material placed in the nearshore of Egmont Key. The benthic organism population will recover in the substrate upon completion of the activity. Also, the water column could be temporarily impacted by increased turbidity of suspended solids from the dredging and placement of material.

4.7.2 PREFERRED ALTERNATIVE – CUTTERHEAD DREDGE

Preferred Alternative – Cutterhead Dredge would result in similar short-term impacts to benthic organisms and water quality as described above for Preferred Alternative – Hopper Dredge.

4.7.3 NO ACTION ALTERNATIVE

Increased shoal build-up in the Federal channel could lead to vessel bottom strikes, which would cause temporary increases in turbidity, further degrading habitat for fish.

4.8 AESTHETICS

4.8.1 PREFERRED ALTERNATIVE – HOPPER DREDGE

Temporary air pollution, water turbidity, and noise pollution increases can be expected during project construction. The dredge equipment will have a temporary effect on the visual shed until completion of the project. The placement of the dredge material into the nearshore area of Egmont Key may provide additional beach habitat along the western shoreline.

4.8.2 PREFERRED ALTERNATIVE – CUTTERHEAD DREDGE

Similar temporary impacts, as described above, will occur with Preferred Alternative – Cutterhead Dredge during construction activities. The placement of dredge material along the shoreline of Longboat Key may provide increased beach habitat by encouraging wildlife usage, as well as vegetative recruitment for a pleasing view.

4.8.3 NO ACTION ALTERNATIVE

There would be no affect on landscape aesthetics by pursuing the no action alternative.

4.9 RECREATION

4.9.1 PREFERRED ALTERNATIVE – HOPPER DREDGE

Preferred Alternative – Hopper Dredge would increase the recreational value of leisure boating in the project area by providing increased access to Sarasota Bay and Tampa Bay.

4.9.2 PREFERRED ALTERNATIVE – CUTTERHEAD DREDGE

Preferred Alternative – Cutterhead Dredge would increase the recreational value of leisure boating in the project area by providing increased access to Sarasota Bay and Tampa Bay.

4.9.3 NO ACTION ALTERNATIVE

The No Action Alternative would result in the decrease in recreational value by continued shoal build-up that impairs usage and access to the area recreational facilities. Continued erosion to the shoreline of either Egmont Key or Longboat Key would occur as a result of the no action alternative.

4.10 NAVIGATION

4.10.1 PREFERRED ALTERNATIVE – HOPPER DREDGE

The Preferred Alternative – Hopper Dredge will result in some temporary disruption of normal vessel traffic in the channel due to the presence and operation of the dredge along with material transport.

4.10.2 PREFERRED ALTERNATIVE – CUTTERHEAD DREDGE

The Preferred Alternative – Cutterhead Dredge will result in some temporary disruption of normal vessel traffic in the channel due to the presence and operation of the dredge along with the routing of an attached pipeline and associated equipment used to transport material for disposal along the shoreline of Longboat Key.

4.10.3 NO ACTION ALTERNATIVE

The No Action Alternative would result in a decrease in the navigability of the channel over time as sediments accumulate in the channel causing obstructions by shoal build-up.

4.11 ECONOMICS

4.11.1 PREFERRED ALTERNATIVE – HOPPER DREDGE

There would be a minor short-term economic stimulus to the local economy from the sale of goods and services in support of the dredging operation. In the past, deepening of Federal navigational channels leading to commercial and recreational centers such as Anna Maria Island, Longboat Key, and Cortez marinas and restaurants have had a positive effect on the local economy.

4.11.2 PREFERRED ALTERNATIVE – CUTTERHEAD DREDGE

Minor short-term economic gains to the community are similar to those described above for Preferred Alternative – Cutterhead Dredge.

4.11.3 NO ACTION ALTERNATIVE

A potential decline in the revenue-generating capabilities of the commercial and recreational centers of Anna Maria Island, Longboat Key, and Cortez would be probable if build-up of shoal material prevents access by recreational and commercial boaters.

4.12 CUMULATIVE IMPACTS

4.12.1 PREFERRED ALTERNATIVE – HOPPER DREDGE

The Preferred Alternative – Hopper Dredge would result in a beneficial cumulative effect to the coastal habitat associated with Egmont Key. The placement of dredged material in the nearshore area of Egmont Key helps to mitigate the intense erosion occurring on the island and could reverse loss of sea turtle nesting habitat. The loss of seagrass within the channel would be a minimal impact as this area supports very small colonies.

4.12.2 PREFERRED ALTERNATIVE – CUTTERHEAD DREDGE

The Preferred Alternative – Cutterhead Dredge would result in a beneficial cumulative effect to the coastal habitat associated with Longboat Key. The placement of dredged material along the shoreline area of Longboat Key helps to mitigate erosion occurring on the beach. The loss of seagrass within the channel would be a minimal impact as this area supports very small colonies.

4.12.3 NO ACTION ALTERNATIVE

The No Action Alternative could potentially have an adverse cumulative effect on the historic properties that are part of the National Register Listed property of Egmont Key.

4.13 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

4.13.1 PREFERRED ALTERNATIVE – HOPPER DREDGE

The Preferred Alternative – Hopper Dredge would result in turbidity generated at both the dredging and disposal sites. The excavation of the material would eliminate benthic organisms within the dredging cuts and cover any benthic organisms potentially present at the disposal site. In addition, there would be a short-term disruption to recreational and commercial navigation and fishing in the Federal navigational channel in Sarasota Bay and on Egmont Key from the presence and operation of the dredged material transport and disposal operations.

4.13.2 PREFERRED ALTERNATIVE – CUTTERHEAD

The Preferred Alternative – Cutterhead Dredge would result in similar effects to turbidity and benthic organisms as described above for Preferred Alternative – Hopper Dredge. In addition, there would be a short-term disruption to recreational and commercial navigation and fishing in the Federal navigational channel in Sarasota Bay and on the western shoreline of Longboat Key from the presence and operation of the dredged material transport and disposal operations.

4.13.3 NO ACTION ALTERNATIVE

The No Action Alternative would not result in any unavoidable effects to the resources discussed in the Section.

4.14 IRREVERSIBLE AND IRRETRIEVABLE RESOURCE COMMITMENTS

A long-term commitment had been made concerning the designation of the placement area for dredged materials in the nearshore environment of Egmont Key, as well as shoreline placement below mean lower low water line of Longboat Key, and for the use and maintenance of the navigational channels.

5 COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

5.1 NATIONAL ENVIRONMENTAL POLICY ACT OF 1969

Environmental information on the project has been compiled and this EA has been prepared. The project is in compliance with the National Environmental Policy Act.

5.2 ENDANGERED SPECIES ACT OF 1973

This project has been coordinated with the National Marine Fisheries Service (NMFS) through the Gulf Regional Biological Opinion (GRBO) dated November 19, 2003, as amended on June 24, 2005 and January 9, 2007. The GRBO (footnote, pages 65-66) states "The COE Wilmington District's sidecast dredges FRY, MERRIT, and SCHWEIZER, and splithull hopper dredge CURRITUCK, are exempt from the above hopper dredging requirements. Their small size and operating characteristics including small draghead sizes [2-ft by 2-ft, to 2-ft by 3-ft], small draghead openings [5-in by 5-in to 5 in by 8 in], small suction intake pipe diameters [10-14 in], and limited draghead suction [350-400 hp]) have been previously determined by NOAA Fisheries to not adversely affect listed species (March 9, 1999, ESA consultation with COE Wilmington District, incorporated herein by reference). The aforementioned vessels and commercial hopper and sidecast dredges of the same or lesser sizes and Operating characteristics working in the Gulf of Mexico would be considered similarly exempt by NOAA Fisheries' SERO after consultation with SERO." Based on this language - no additional consultation with NMFS is required. Applicable pages from the GARBO regarding the use of special use dredges like the Currituck are included in Appendix E. A full copy of the GARBO is available at:

<http://el.erdc.usace.army.mil/seaturtles/refs-bo.cfm>

Section 7 consultation was initiated on March 23, 2011 with the US Fish and Wildlife Service (USFWS). Response was received from Mr. David Hankla, North Florida Field Office Supervisor, on August 2, 2011, see Appendix E. The USFWS has determined that the proposed project is appropriate to apply to the USFWS Final Statewide Programmatic Biological Opinion (SPBO), (signed April 25, 2011, and revised version August 22, 2011) is applicable to navigation maintenance dredging activities along the coast of Florida (FWS Log No. 41910-2011-F-0170). The Corps concurs with this determination that the Reasonable and Prudent Measures, and Terms and Conditions in the SPBO are applicable for this project. The SPBO is available on the internet at the below link, under "beach mouse and sea turtle" heading:

<http://www.fws.gov/northflorida/Tools2Use/consult-landowner-refs.htm>

This project has been coordinated with the US Fish and Wildlife Service (FWS). This project is in full compliance with this Act.

5.3 NATIONAL HISTORIC PRESERVATION ACT OF 1966, AS AMENDED AND ABANDONED SHIPWRECK ACT

Federal undertakings will comply with the National Historic Preservation Act of 1966, as amended (16 USC 470); the Archeological and Historical Preservation Act of 1974 (16 USC 469-469c); Executive Order 11593, the Abandoned Shipwreck Act of 1987 (PL 100-298; 43 U.S.C. 2101-2106); and the Advisory Council on Historic Preservation's implementing regulations under 36CFR800 (*Protection of Historic Properties*).

Coordination and consultation with the Florida SHPO, appropriate federally recognized tribes, and other interested parties has been initiated as of September, 30, 2010, in accordance with the National Historic Preservation Act, as amended (PL89-665); the Archaeological and Historic Preservation Act, as amended (PL93-29); Executive Order 11593, the Abandoned Shipwreck Act of 1987, and appropriate Florida Statutes.

5.4 CLEAN WATER ACT OF 1972

This project is in compliance with this Act. A Section 401 water quality certification from Florida Department of Environmental Protection (FDEP) is pending and when available, will be included in Appendix C. All state water quality standards are expected to be met. A Section 404(b) evaluation is included in this EA as Appendix A.

5.5 CLEAN AIR ACT OF 1972

No air quality permits are required for this project. The draft version of this EA serves as coordination with the US Environmental Protection Agency (USEPA) to comply with Section 309 of the Act. USEPA letter dated August 4, 2011, acknowledges the EA document to be consistent with Section 102(2)(c) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act. No objections, concerns or issues were noted with regard to the proposed project as documented in the EA. This project would not produce any significant new atmospheric emissions; therefore, this project complies with the Clean Air Act. A copy of the comments from EPA regarding this project is included in Appendix I.

5.6 COASTAL ZONE MANAGEMENT ACT OF 1972

A Federal consistency determination in accordance with 15 CFR 930 Subpart C of the Coastal Zone Management Act (CZMA) is included in this report as Appendix B. The State of Florida will determine the project's consistency with the Florida Coastal Zone Management Program through the issuance of pending FDEP Joint Coastal Permit (JCP) (DEP File No. 0305363-001-JC) which is included in Appendix C upon issuance.

The State of Florida has requested that the Corps withdraw the consistency determination (CD) because FDEP is currently reviewing the application of the JCP for this project (Appendix C). In addition, the Florida Coastal Management Plan (FCMP) requires the State to issue final CZMA concurrence with issuance of the permit. This is in lieu of the typical interim concurrence, which the Corps has received in the past during the NEPA review period. As water quality permitting and NEPA are processing concurrently, the Corps is able to accommodate the State with this request for this unique circumstance. The Corps anticipates issuance of the JCP, and final consistency concurrence, for this project in early November, 2011.

5.7 FARMLAND PROTECTION POLICY ACT OF 1981

No prime or unique farmland will be impacted by implementation of this project. Therefore, this project is in compliance with this Act.

5.8 WILD AND SCENIC RIVER ACT OF 1968

No designated wild and scenic river reaches will be affected by the project related activities. Therefore, this project is in compliance with this Act.

5.9 MARINE AND MAMMAL PROTECTION ACT OF 1972

To ensure the protection of any manatees present in the project area, the conditions outlined in FDEP Permit (pending) and the standard FWS manatee construction protocol will be implemented during construction (see Appendix C). Therefore, this project is in compliance with the Marine Mammal Protection Act (MMPA) of 1972.

5.10 ESTUARY PROTECTION ACT OF 1968

No designated estuary would be affected by project activities. Therefore, this project is in compliance with this Act.

5.11 FEDERAL WATER PROJECT RECREATION ACT

There is no recreational development proposed as part of this maintenance dredging and disposal project. Therefore, this project is in compliance with this Act.

5.12 SUBMERGED LANDS ACT OF 1953

Sand placement in the nearshore area of Egmont Key would occur on submerged lands of the State of Florida. This has been coordinated with the State and the project is in compliance with the Act.

5.13 COASTAL BARRIER RESOURCES ACT AND COASTAL BARRIER IMPROVEMENT ACT OF 1990

There are no designated coastal barrier resources in the project area that would be affected by this project. Therefore, this project is in compliance with these Acts.

5.14 RIVERS AND HARBORS ACT OF 1899

The proposed work would not obstruct navigable waters of the United States. The proposed action will be subject to the public notice, public hearing, and other evaluations normally conducted for activities subject to the Act. The project is in compliance with this Act.

5.15 ANADROMOUS FISH CONSERVATION ACT

Anadromous fish species would not be affected by the proposed work. Comments that may be received from National Marine Fisheries Service (NMFS) as a result of this EA will be incorporated into the final document. The project is in compliance with the Act.

5.16 MIGRATORY BIRD TREATY ACT AND MIGRATORY BIRD CONSERVATION ACT

There would be a short-term, moderate impact on migratory bird nesting should the construction occur during the 1 April to 30 August timeframe should the Preferred

Alternative – Cutterhead be chosen for the project that includes placement of material along the shoreline of Longboat Key. However, this impact will be minimized by implementing the District’s Migratory Bird Protection Protocol. If the work occurs outside this timeframe, there would be no adverse impacts to migratory birds. There would be a long-term, moderate benefit to nesting by providing additional suitable habitat for nesting. The project is in compliance with these Acts.

5.17 MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT

The term *dumping* as defined in the Act (33 U.S.C. 1402)(f) does not apply to the placement of material for a purpose other than disposal (i.e. placement of rock material as an artificial reef or the construction of artificial reefs as mitigation). Therefore, the Marine Protection, Research and Sanctuaries Act does not apply to this project. The disposal activities addressed in this EA have been evaluated under Section 404 of the Clean Water Act.

5.18 MAGNUSON – STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

An assessment of the project’s potential effects on EFH is included within this EA in Section 4.7. NMFS comments are pending. It is not anticipated that they will object to the Department of the Army’s authorization of this activity. Comments have been added to this EA as provided. Therefore, this project is in compliance with this Act.

5.19 E.O. 11990, PROTECTION OF WETLANDS

No wetlands would be affected by the proposed project activities. This project is in compliance with this Executive Order.

5.20 E.O. 11988, FLOOD PLAIN MANAGEMENT

No activities associated with the Preferred Alternative(s) would take place within a floodplain; therefore, this project is in compliance with this Executive Order.

5.21 E.O. 12898, ENVIRONMENTAL JUSTICE

This project would not result in adverse human health or environmental effects. In addition, no impacts on the ability of minority or low-income populations to obtain fish or wildlife for subsistence consumption will occur. Therefore, no impacts to minority or low-income populations would occur. This project is in compliance with this Executive Order.

5.22 E.O. 13089, CORAL REEF PROTECTION

There are no coral reefs located in the project area, nor are there any “species, habitats, and other natural resources associated with coral reefs.” This project is in compliance with this Executive Order.

5.23 E.O. 13112, INVASIVE SPECIES

This project will not have either a positive or a negative effect on the status of invasive species. This project is in compliance with this Executive Order.

6 LIST OF PREPARERS

6.1 PREPARERS AND REVIEWERS

<u>Name</u>	<u>Affiliation</u>	<u>Information</u>
Kathleen McConnell	US Army Corps of Engineers	Biologist, Primary Author
Jason Spinning	US Army Corps of Engineers	Biologist, Technical Advisor/Reviewer
Terri Jordan-Sellers	US Army Corps of Engineers	Biologist, Technical Advisor/Reviewer
Wendy Weaver	US Army Corps of Engineers	Archaeologist, Cultural Resource Analysis

7 PUBLIC INVOLVEMENT

7.1 SCOPING AND DRAFT EA

A public notice (PN) was issued by Operations Division for the proposed dredging and nearshore/shoreline placement project on July 21, 2011, under PN-OP-GIWW-290. The PN contained notice of the Draft Environmental Assessment, and provided 30-day period for public comment.

A scoping letter was sent to parties having an interest in this project on December 27, 2010. A copy of the scoping letter and responses are included in Appendix I of this EA.

7.2 AGENCY COORDINATION

The EA was coordinated with the appropriate agencies. Any agency coordination letters received as a result of this coordination effort are included in Appendix I of this EA.

7.3 LIST OF RECIPIENTS

PN was provided July 21, 2011 regarding the availability to review the EA during the PN comment period. A list of recipients on the mailing list is included in Appendix I of this EA.

7.4 COMMENTS RECEIVED AND RESPONSES

The following are comments that were received during the 30-day public commentary period in regards to the Draft EA that was made available to the public on July 21, 2011. Copies of correspondence are included in Appendix I of this EA.

Florida Representative Larry Ahern, District 51, phone conversation with Corps PD-EC Biologist Kathleen McConnell on July 27, 2011. Rep. Ahern was seeking information regarding placement at Egmont Key, whether it was located within an Aquatic Preserve, and what potential impact on resources would result from disposal at Egmont Key. Details of the project were discussed and all questions were answered satisfactorily. No issues or concerns were expressed in opposition to the project as proposed.

United States Environmental Protection Agency (USEPA), letter dated August 4, 2011, acknowledges the EA document to be consistent with Section 102(2)(c) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act. No objections, concerns or issues were noted with regard to the proposed project as documented in the EA.

Southwest Florida Water Management District, letter dated August 19, 2011 was received with comments regarding the mitigation plan addressing the impacts on seagrass.

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Bald and Golden Eagle Protection Act

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Wood Stork Fact Sheet:

<http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?scode=B06O>

GIWW - LONGBOAT PASS ENVIRONMENTAL ASSESSMENT

APPENDIX A

SECTION 404(B) EVALUATION

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SECTION 404(B) EVALUATION

MAINTENANCE DREDGING WITH BEACH PLACEMENT GIWW AND LONGBOAT PASS MANATEE AND HILLSBOROUGH COUNTIES, FLORIDA

I. Project Description

a. Location.

(1) The Federal navigation project is located along the Gulf Intracoastal Waterway (GIWW) within Sarasota Bay adjacent to Longboat Key and Anna Maria Island, Gulf of Mexico, Manatee County, Section 9, 10, 15, 16, Township 35 South, Range 16 East, Manatee County, Florida, (**Figure 1**, Section 1).

(2) The dredged material placement will occur in the nearshore environment approximately 1,500-5,000 linear feet from the western shoreline of Egmont Key, which is located about 10.5 miles from the dredge site at the mouth of Tampa Bay in Hillsborough County, Florida, (**Figure 2**, Section 1). In the event that a discharge pipeline will be used for dredged material disposal, beach quality sand may be placed along the shoreline of Longboat Key, approximately 7,600 feet south of Longboat Pass, between Florida Department of Environmental Protection (FDEP) Monuments R-44 and R-51, (**Figure 3**, Section 1).

b. General Description. The proposed plan calls for the maintenance dredging of GIWW Cuts M-5, M-12, M-14 and Longboat Pass Cuts LB2 and LB-3. (**Figure 1**, Section 1). Approximately 94,500 cubic yards of non-suitable beach quality material would be placed in the nearshore area from 1500 to 5000 feet from the shoreline of Egmont Key (**Figure 3**, Section 1). Dredging would be performed by a hopper split-hull dredge.

Figure 1. GIWW / Longboat Pass Vicinity Map

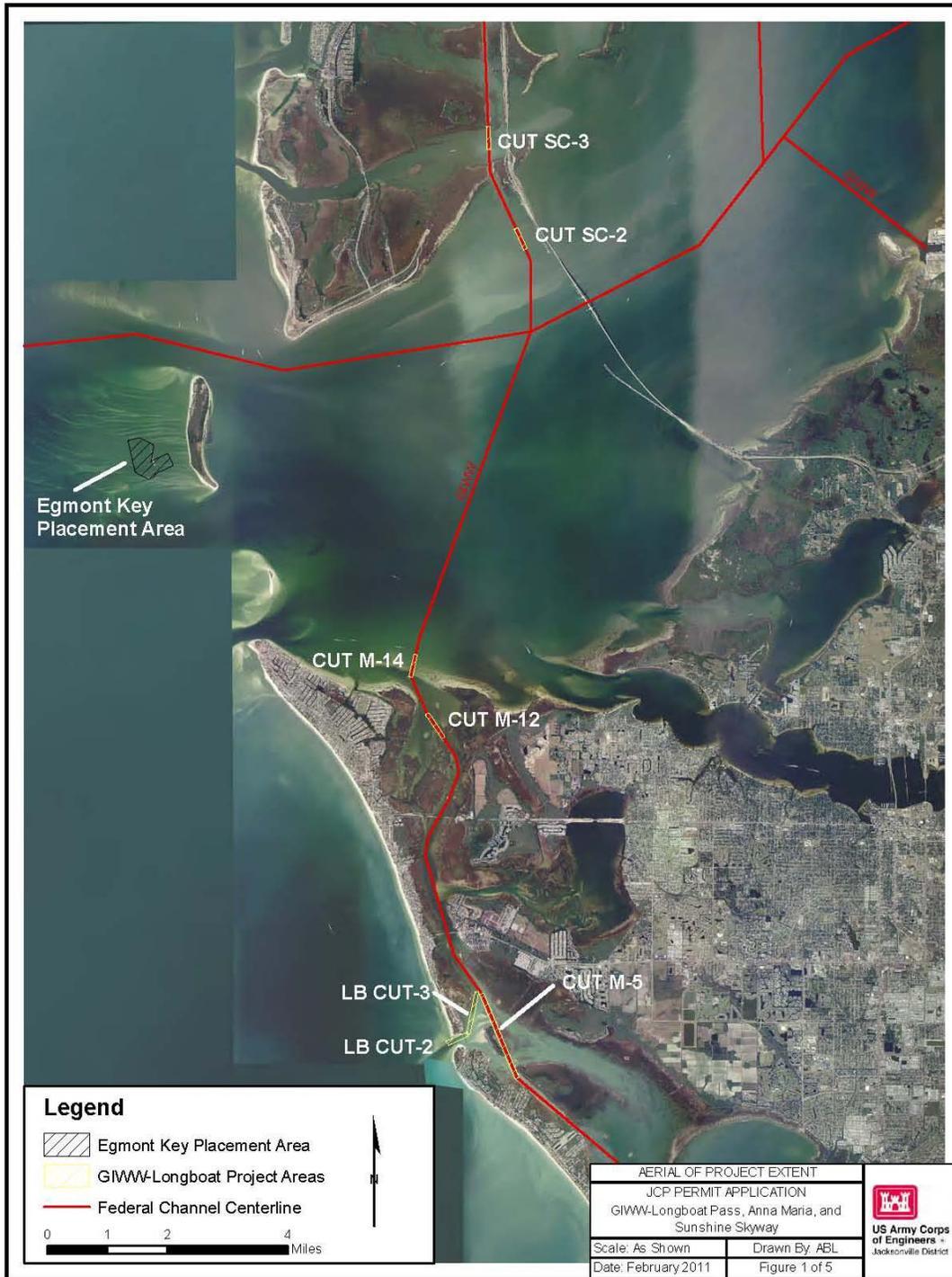
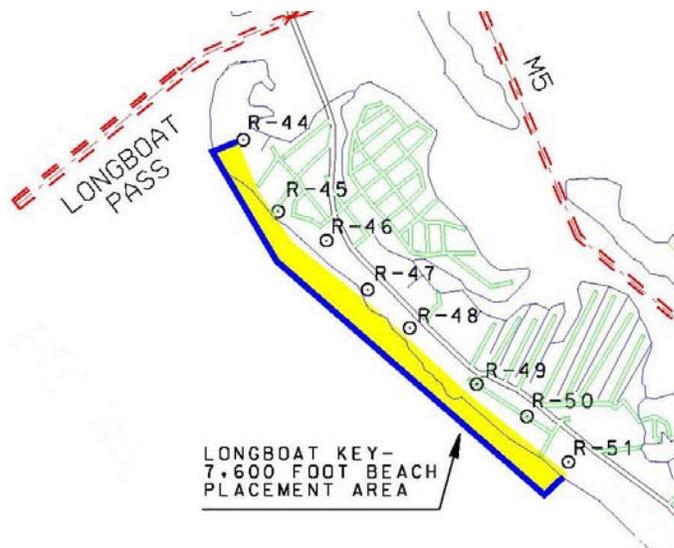


Figure 2. Nearshore placement location at Egmont Key



Figure 3. Alternate Placement on Longboat Beach.



c. Authority and Purpose. The GIWW from Caloosahatchee River to Anclote River (Florida) was authorized at 100 feet wide by 9 feet deep by H. Doc. 371/76/1 on 2 March 1945, and Longboat Pass (Florida) was authorized on 14 July 1960 (approved by the Chief of Engineers 20 April 1976, under Section 107 of 1960 Rivers and Harbors Act) at 12 feet deep by 150 feet wide from the Gulf of Mexico to Longboat Pass Bridge; thence, 10 feet deep by 100 feet wide to and along the GIWW to the Cortez Bridge (which divides Anna Maria Sound from Sarasota Bay).

d. General Description of Dredged or Fill Material.

(1) General Characteristics of Material. The physical structure of the sediments from the Federal Navigation Project (FNP) FNP can be described as sand to silty sand. Sediment cores were collected from GIWW Cuts M-5, M-12 and M-14, and Longboat Cuts LB 2 and LB-3. The sediment encountered within the proposed dredging depth consists of poorly graded sands, and sands containing silt that include trace to some shell fragments. Silty sands were only encountered in the overdepth of GIWW Cuts M-5 and M-12 at an elevation of -9.9 feet MLLW.

(2) Quantity of Material. Approximately 94,500 cubic yards of material would be removed from the channel as needed.

(3) Source of Material. The source of the material would be obtained from GIWW Cuts M-5, M-12 and M-14, and Longboat Cuts LB-2 and LB-3. Source of the material includes sandy sediments being carried into described area by littoral drift.

e. Description of the Placement Site.

(1) Size and Location. The proposed placement area is located 1,500 to 5,000 feet from the western shoreline of Egmont Key. Approximately 94,500 cubic yards of material would be placed over 177 acres of nearshore environment (**Figure 3, Section 1**).

(2) Type of Site. The discharge site includes a shallow, unconsolidated substrate nearshore environment.

(3) Type(s) of Habitat. Dredge material would be placed over similar material consisting of carbonate and quartz at the intertidal, and shallow nearshore zones. Section 3 of the Environmental Assessment provides a detailed discussion on existing habitat.

(4) Timing and Duration of Discharge. The dredging is currently scheduled

to occur in September, 2011. The project is anticipated to take approximately 30 days to complete.

f. Description of Disposal Method. A split-hull hopper dredge will transport the dredged material to the proposed nearshore placement site and will deposit the material directly onto the substrate. No pipeline or side mount discharge will be used.

g. Access to Construction Site. The dredging area is located within the GIWW and Longboat Pass Federal navigation channels and is accessible to construction equipment. The placement area is located in open ocean (nearshore).

II. Factual Determinations (Section 230.11)

a. Physical Substrate Determinations (consider items in sections 230.11(a) and 230.20 Substrate)

(1) Substrate Elevation and Slope. The material is sediment that has accumulated in the channel above the authorized depths of the GIWW and Longboat Pass Federal navigation channels.

(2) Sediment Type. The sediment from the project area is silty sand that is non-suitable for beach placement.

(3) Dredged/Fill Material Movement. Material is subject to erosion by waves with net movement of fill material to the south and west in the littoral zone adjacent to Jewfish Key, Longboat Key and Anna Maria Island.

(4) Physical Effects on Benthos. The placement of sand in the nearshore environment off Egmont Key will result in the burial and subsequent loss of most of the beach infauna. These infaunal populations should recover to pre-placement levels within one year after completion of deposition.

(5) Actions Taken to Minimize Impacts. Construction personnel would be briefed of the necessity to protect cultural resources outside the footprint of impact. Monitoring personnel would also provide an added dimension of protection for existing resources.

b. Water Circulation. Fluctuation and Salinity Determinations

(1) Water Column Effects. Some temporary impacts would result from the suspension of materials during dredging and discharge. Small particles suspended during dredging would have an adverse but temporary impact on water clarity at the point of dredging and in the nearshore zone at the discharge point. This increased turbidity would reduce the amount of light that is able to penetrate the light column. The project proposes no long-term impacts to salinity, water chemistry, color, odor, dissolved gas levels, nutrients or eutrophication

(2) Current Patterns and Circulation. The net movement of water within the project area is from the south to north. The project would have no effect on existing current patterns, current flow, velocity, stratification, or the hydrologic regime in the area.

(3) Normal Water Level Fluctuation and Salinity Gradients. Tides in the project area are semi-durnal, with two high and two low tides occurring each day. The average tidal range along the GIWW is 2.3 feet with a mean tide level of 1.91 feet. Salinity is that of oceanic waters. The project would not affect normal tide fluctuations or salinity gradients.

c. Suspended Particulate/Turbidity Determinations

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site. The project would have a temporary adverse impact on turbidity at the dredge site and in the nearshore zone near the discharge. Some small sediment particles, primarily of silt grain size would become suspended in the water column during dredging and material placement activities, thereby causing an increase in water turbidity. This increase in turbidity is not expected to have a significant impact on the surrounding environment since project related increases in turbidity would be of limited duration and areal extent. The amount of temporary turbidity that would be produced would be low since the silt content of sediments is moderate. Any turbidity produced by the project is expected to quickly dissipate as a result of normal current and wave activity. Potential impacts related to increased turbidity would be further minimized by monitoring water quality at both the dredge and discharge sites. If turbidity levels exceed the state standard outside of state authorized mixing zones, all dredging activities shall be suspended until turbidity levels are within the allowable standards.

(2) Effects on the Chemical and Physical Properties of the Water Column.

(a) Light Penetration. Some decrease in light penetration may occur in the immediate vicinity of the dredge and discharge sites, due to turbidity in the nearshore area during construction. The immediate nearshore area is a high wave energy system and subject to naturally occurring elevated turbidity and

sediment, increases due to project construction should not be significant. Normally a nearshore turbidity monitoring program with a plume-mixing zone of 150 meters would be required. Given the project site is located in Outstanding Florida Waters a reduced mixing zone of 75 meters for maintenance dredging activities would be maintained. A reduced mixing zone of 75 meters would reduce the potential for secondary impacts related to turbidity and sedimentation on adjacent seagrass beds. No additional information is required regarding this item. This effect will be short-term and have limited adverse impacts on the nearshore environment during construction activities.

(b) Dissolved Oxygen. These levels will not be altered by the project.

(c) Toxic Metals, Organics, and Pathogens. No toxic metals, organics, or pathogens will be disturbed or released at levels that exceed state water quality standards. The material will be tested as required of MPRSA and the EPA to determine suitability of disposal.

(d) Aesthetics. Aesthetic quality will be reduced during that period when work is occurring. There will be a long-term increase in aesthetic quality of the beach once the work is completed.

(3) Effects on Biota. Substrate type and the presence of associated biota are influenced by sand movement. In areas where sand is constantly shifting, moving either on or offshore, the presence of low- and high-relief substrate will vary. The loss of material within the Federal channel is not expected to expose previously covered rocky substrate creating reef habitat.

(a) Primary Production, Photosynthesis. The project would have little to no adverse effects on existing primary productivity and photosynthesis within the dredged areas or fill placement site. Several species of seagrass are scattered with the channel of the GIWW within Cut M-5, and along the buffering edge of channel in M-12 and M-14. Some impacts will occur to seagrass established within the existing FNP. Appendix F contains the seagrass locations type and quantity within the project study area.

(b) Suspension/Filter Feeders. Suspension and filter feeders within the dredge area and fill site would be physically removed or buried as a result of the project. These losses would be temporary since many suspension and filter feeding organisms have high reproductive rates and quickly colonize disturbed areas.

(c) Sight Feeders. Project related increases in turbidity would not have a long-term impact on this value. Dredging and placement of fill material would cause some increases in turbidity, the resulting turbidity would be of short

duration and would affect a limited area. Most sight feeders are highly mobile and would be able to relocate to areas unaffected by project activities.

(4) Actions taken to Minimize Impacts. All practical safeguards would be taken during construction to either avoid or minimize impacts and to preserve values associated with the environment, aesthetics, recreation, and economics. Specific precautions that would be implemented in conjunction with the proposed project are discussed elsewhere in this 404(b) evaluation and in the Environmental Assessment for this project.

d. Contaminant Determinations. The material to be secured from the proposed maintenance dredging would be clean sand free of contaminants.

e. Aquatic Ecosystem and Organism Determinations. The grain size characteristics and composition exhibited by the proposed fill material are similar to those of the existing beach sediments. No sediment related impacts are expected. The proposed fill material meets the exclusion criteria, therefore, no additional chemical-biological interactive testing would be required.

(1) Effects on Plankton. No adverse long-term impacts to plankton-type organisms are anticipated.

(2) Effects on Benthos. No adverse long-term impacts to non-motile or motile benthic invertebrates are anticipated.

(3) Effects on Nekton. No adverse long-term impacts to nektonic species are anticipated.

(4) Effects on Aquatic Food Web. No adverse long-term impact to any trophic group in the food web is anticipated.

(5) Effects on Special Aquatic Sites. Approximately 0.33 acre of seagrass has the potential of directly impacted by the construction activity. These impacts would be from removal by dredging and localized increases in turbidity and sedimentation.. Mitigation to offset these impacts is proposed in Appendix H. Precautionary measures would be implemented to protect any exposed ephemeral hardbottom communities in the offshore area of the fill placement area.

(6) Coral Reefs (refer to Section 230.44). There are no coral reef established within the immediate vicinity of the borrow area.

(7) Threatened and Endangered Species. There would be no significant adverse impact to any threatened or endangered species or to the critical habitat of any threatened or endangered species. Measures would be in place to protect marine species in the water or on land. Sea turtle nesting may occur adjacent to the

project area during the time that dredging nearshore dredge material disposal takes place. If construction occurs during the nesting season, a nest relocation program will be implemented as recommended by the USFWS. Manatee protection measures as specified by the USFWS will be followed to minimize the potential for harm. See Sections 3 and 4 of the Environmental Assessment.

(8) Other Wildlife. No adverse impacts to small foraging mammals, reptiles, wading birds, or wildlife in general are anticipated to occur as a result of this activity.

(9) Actions to Minimize Impacts. All practical safeguards will be taken during construction to preserve and enhance environmental, aesthetic, recreational, and economic values in the project area. Specific precautions that will be implemented in conjunction with the proposed project are discussed elsewhere in this 404(b) evaluation.

f. Proposed Disposal Site Determinations.

(1) Mixing Zone Determination. No mixing will likely occur due to the sandy nature of the dredged material, the shallow water depth, and the small quantity of fine-grained particles associated with the material.

(2) Determination of Compliance with Applicable Water Quality Standards. The waters of the project area are designated Outstanding Florida Waters (OFW). The project would temporarily exceed acceptable level and a variance is needed to meet standards outside of the established mixing zone for OFW.

(3) Potential Effects on Human Use Characteristic

(a) Municipal and Private Water Supply. The project proposes no adverse impacts to municipal or private water supplies. Reservoirs for these resources are not located within or near the project site.

(b) Recreational and Commercial Fisheries. Fishing or other recreational activities that are common to the area would be suspended during construction activities; as well as, boating or fishing within the immediate project area. Fishing within the project area is not expected. Recreational swimming in the project area would be prohibited. Other than the listed activities, the project proposed no adverse impacts to recreational or commercial fisheries.

(c) Water Related Recreation. Activities of this nature are not expected to occur within the project area.

(d) Aesthetics. The proposed dredging and discharge of the dredged materials would increase noise and degrade the scenery in the channel and the disposal site. Although the placement of material in the nearshore area of Egmont would temporarily decrease the aesthetic value of that area, there would be a long-term increase in shoreline habitat.

(e) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. The project proposes no adverse impacts to these resources.

g. Determination of Cumulative Effects on the Aquatic Ecosystem. There will be no cumulative impacts that result in a significant impairment of water quality as a result of the dredging of the channel cuts or the disposal of the dredged material at the proposed placement area.

h. Determination of Secondary Effects on the Aquatic Ecosystem. There will no secondary impacts on the aquatic ecosystem as a result of the dredging of the channels or the disposal of the dredged material at the placement site.

III. Findings of Compliance or Non-Compliance with the Restrictions on Discharge.

a. No significant adaptations of the guidelines were made relative to this evaluation.

b. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem. The No Action Alternative would not have met the study objectives. Therefore, no practicable alternative exists which meets the study objectives of maintaining the channel depths for use by commercial and/or recreational vessels utilizing the GIWW and Longboat Pass Federal navigation channels.

c. Compliance with Applicable State Water Quality Standards. After consideration of disposal site dilution and dispersion, the discharge of fill materials will not cause or contribute to, violations of any applicable state water quality standards for Class III waters. The discharge operation will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

d. Compliance with the Endangered Species Act of 1973. The maintenance dredging of the GIWW and Longboat Pass, with placement of dredged material in the nearshore area of Egmont Key will not jeopardize the continued existence of any species listed as threatened or endangered or result in the likelihood of destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973, as amended.

e. Evaluation of Extent of Degradation of the Waters of the United States. The placement of fill material will not result in significant adverse effects on human health

and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic species and other wildlife will not be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values will not occur.

f. Appropriate steps have been taken to minimize the adverse environmental impact of the proposed action.

g. Based on these guidelines, the proposed disposal site for the discharge of dredge material is specified as complying with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the aquatic ecosystem.

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GIWW - LONGBOAT PASS ENVIRONMENTAL ASSESSMENT

APPENDIX B

COASTAL ZONE MANAGEMENT CONSISTENCY

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**FLORIDA COASTAL ZONE MANAGEMENT PROGRAM
FEDERAL CONSISTENCY EVALUATION PROCEDURES**

**GULF INTRACOASTAL WATERWAY (GIWW) CUTS M-5, M-12, AND M-14, &
LONGBOAT PASS CUTS LP-2 AND LP-3**

MAINTENANCE DREDGING WITH NEARSHORE MATERIAL PLACEMENT

MANATEE AND HILLSBOROUGH COUNTIES, FLORIDA

1. Chapter 161, Beach and Shore Preservation.

The intent of the coastal construction permit program established by this chapter is to regulate construction projects located seaward of the line of mean high water and which might have an effect on natural shoreline processes.

Response: This project contemplates regional sediment management, and implements an action that best manages the sediment in the region.

2. Chapters 163 (part II), 186, and 187, County, Municipal, State and Regional Planning.

These chapters establish the Local Comprehensive Plans, the Strategic Regional Policy Plans, and the State Comprehensive Plan (SCP). The SCP sets goals that articulate a strategic vision of the State's future. Its purpose is to define in a broad sense, goals, and policies that provide decision-makers directions for the future and provide long-range guidance for an orderly social, economic and physical growth.

Response: The proposed project has been coordinated with various Federal, State and local agencies during the planning, NEPA, and permitting processes. The project meets the primary goal of the State Comprehensive Plan for beaches through preservation and protection of existing shores, shorefront development and infrastructure.

3. Chapter 186, FS, STATE AND REGIONAL PLANNING.

The state comprehensive plan provides basic policy direction to all levels of government regarding the orderly social, economic, and physical growth of the state. The goals, objectives, and policies of the state comprehensive plan are statewide in scope and are consistent and compatible with each other. The statute provides direction for the delivery of governmental services, a means for defining and achieving the specific goals of the state, and a method for evaluating the accomplishment of those goals.

Response: The proposed project has been coordinated with various Federal, State and local agencies during the planning process. The project meets the primary goal of the State Comprehensive Plan through preservation and protection of the shorefront development and infrastructure.

4. Chapter 252, Disaster Preparation, Response and Mitigation.

This chapter creates a state emergency management agency, with the authority to provide for the common defense; to protect the public peace, health and safety; and to preserve the lives and property of the people of Florida.

Response: The proposed project involves the dredging of the GIWW and Longboat Pass in order to maintain safe navigation conditions. The project will ensure the channel will have a safe access for vessels traveling to or from Sarasota Bay, Tampa Bay, and the Gulf of Mexico. Therefore, this project as proposed is consistent with the efforts of Division of Emergency Management.

5. Chapter 253, State Lands.

This chapter governs the management of submerged state lands and resources within state lands. This includes archeological and historical resources; water resources; fish and wildlife resources; beaches and dunes; submerged grass beds and other benthic communities; swamps, marshes and other wetlands; mineral resources; unique natural features; submerged lands; spoil islands; and artificial reefs.

Response: The proposed maintenance dredging will not adversely affect the resources protected in this Chapter. Therefore, the proposed project would comply with the intent of this chapter.

6. Chapters 253, 259, 260, and 375, Land Acquisition.

This chapter authorizes the state to acquire land to protect environmentally sensitive areas.

Response: Since the affected property already is in public ownership, this chapter does not apply.

7. Chapter 258, State Parks and Aquatic Preserves.

This chapter authorizes the state to manage state parks and preserves. Consistency with this statute would include consideration of projects that would directly or indirectly adversely impact park property, natural resources, park programs, management or operations.

Response: The proposed project area contains Florida aquatic preserve. Project related activities are not anticipated to adversely affect the environment within the aquatic preserve. This project has been fully coordinated with the state, and therefore, is consistent with this chapter.

8. Chapter 267, Historic Preservation.

This chapter establishes the procedures for implementing the Florida Historic Resources Act responsibilities.

Response: This project has been coordinated with the State Historic Preservation Officer (SHPO). Survey results indicated no historical properties in the project area. The project will be consistent with the goals of this chapter.

9. Chapter 288, Economic Development and Tourism.

This chapter directs the state to provide guidance and promotion of beneficial development through encouraging economic diversification and promoting tourism.

Response: The maintenance dredging of the GIWW and Longboat Pass will maintain navigation corridor critical to local and national commerce. The project is compatible with tourism for this area and therefore, is consistent with the goals of this chapter.

10. Chapters 334 and 339, Transportation.

This chapter authorizes the planning and development of a safe balanced and efficient transportation system.

Response: The maintenance dredging of the inlet and connecting areas promotes and maintains navigation within the inlet and the Intracoastal Waterway.

11. Chapter 372, Living Land and Freshwater Resources.

This chapter establishes the Game and Freshwater Fish Commission and directs it to manage freshwater aquatic life and wild animal life and their habitat to perpetuate a diversity of species with densities and distributions which provide sustained ecological, recreational, scientific, educational, aesthetic, and economic benefits.

Response: The project will have no effect on freshwater aquatic life or wild animal life. Therefore, the work complies with the goals of this chapter.

12. Chapter 373, Water Resources.

This chapter provides the authority to regulate the withdrawal, diversion, storage, and consumption of water.

Response: This project does not involve water resources as described by this chapter.

13. Chapter 375, F.S., Outdoor Recreation and Conservation Lands

The statute addresses the development of a comprehensive multipurpose outdoor recreation plan. The purpose of the plan is to document recreational supply and demand, describe current recreational opportunities, estimate the need for additional recreational opportunities, and propose the means to meet the identified needs.

Response: This project will benefit recreation by preventing obstruction in the channel for recreational boating. The project will have no effect to the Sarasota Bay Aquatic Preserve.

14. Chapter 376, Pollutant Spill Prevention and Control.

This chapter regulates the transfer, storage, and transportation of pollutants and the cleanup of pollutant discharges.

Response: The contract specifications will prohibit the contractor from dumping oil, fuel, or hazardous wastes in the work area and will require that the contractor adopt safe and sanitary measures for the disposal of solid wastes. A spill prevention plan will be required.

15. Chapter 377, Oil and Gas Exploration and Production.

This chapter authorizes the regulation of all phases of exploration, drilling, and production of oil, gas, and other petroleum products.

Response: This project does not involve the exploration, drilling or production of gas, oil or petroleum product, this chapter does not apply.

16. Chapter 379, Fish and Wildlife Conservation

The framework for the management and protection of the state of Florida's wide diversity of fish and wildlife resources are established in this statute. It is the policy of the state to conserve and wisely manage these resources. Particular attention is given to those species defined as being endangered or threatened. This includes the acquisition or management of lands important to the conservation of fish and wildlife.

This statute contains specific provisions for the conservation and management of marine fisheries resources. These conservation and management measures permit reasonable means and quantities of annual harvest, consistent with maximum practicable sustainable stock abundance, as well as ensure the proper quality control of marine resources that enter commerce.

Additionally, this statute supports and promotes hunting, fishing and the taking of game opportunities in the State. Hunting, fishing, and the taking of game are considered an important part in the state's economy and in the conservation, preservation, and management of the state's natural areas and resources.

Response: The proposed nearshore disposal or beach fill may represent a temporary short-term impact to infaunal invertebrates by burying these organisms. However, these organisms are highly adapted to the periodic burial by sand in the intertidal zone. These organisms are highly fecund and are expected to return to pre-construction levels within six months to one year after construction. Nearshore disposal for material placement will not have an effect to nesting sea turtles. Shoreline disposal activities either would not be performed during the main part of the sea turtle nesting season or is not located on a high nesting density beach. It is not expected that sea turtles would be significantly impacted by this project. In addition, the project will have no effect on freshwater aquatic life or wild animal life. Based on the overall impacts of the project, the project is consistent with the goals of this chapter.

17. Chapter 380, Environmental Land and Water Management.

This chapter establishes criteria and procedures to assure that local land development decisions consider the regional impact nature of proposed large-scale development. This chapter also deals with the Area of Critical State Concern program and the Coastal Infrastructure Policy.

Response: The proposed dredging and nearshore placement have been coordinated with the local regional planning commission. Therefore, the project is consistent with the goals of this chapter.

18. Chapters 381 (selected subsections on on-site sewage treatment and disposal systems) and 388 (Mosquito/Arthropod Control).

Chapter 388 provides for a comprehensive approach for abatement or suppression of mosquitoes and other pest arthropods within the state.

Response: The project would not further the propagation of mosquitoes or other pest arthropods.

19. Chapter 403, Environmental Control.

This chapter authorizes the regulation of pollution of the air and waters of the state by the Florida Department of Environmental Regulation (now a part of the Florida Department of Environmental Protection).

Response: A Final Environmental Assessment addressing project impacts has been prepared and was reviewed by the appropriate resource agencies including the Florida Department of Environmental Protection. Environmental protection measures will be implemented to ensure that no lasting adverse effects on water quality, air quality, or other environmental resources will occur. This certification would be achieved prior to the start of construction. The project complies with the intent of this chapter.

20. Chapter 553, F.S., Building and Construction Standards.

The statute addresses building construction standards and provides for a unified Florida Building Code.

Response: This project does not involve construction of any buildings; this chapter does not apply.

21. Chapter 582, Soil and Water Conservation.

This chapter establishes policy for the conservation of the state soil and water through the Department of Agriculture. Land use policies will be evaluated in terms of their tendency to cause or contribute to soil erosion or to conserve, develop, and utilize soil and water resources both onsite or in adjoining properties affected by the project. Particular attention will be given to projects on or near agricultural lands.

Response: The proposed project is not located near or on agricultural lands; this chapter does not apply.

22. Chapter 597, F.S., Aquaculture

The statute establishes public policy concerning the cultivation of aquatic organisms in the state. The intent is to enhance the growth of aquaculture, while protecting Florida's environment. This includes a requirement for a state aquaculture plan which provides for the coordination and prioritization of state aquaculture efforts, the conservation and enhancement of aquatic resources and which provides mechanisms for increasing aquaculture production for the creation of new industries, job opportunities, income for aquaculturists, and other benefits to the state.

Response: The proposed project is not located near or on aquacultural property; this chapter does not apply.

GIWW - LONGBOAT PASS ENVIRONMENTAL ASSESSMENT

APPENDIX C

SECTION 401 WATER QUALITY CERTIFICATION

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Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard, Jr.
Secretary

CERTIFIED - RETURN RECEIPT REQUESTED

November 14, 2011

Eric P. Summa, Chief
Environmental Branch
U.S. Army Corps of Engineers
701 San Marco Blvd.
Jacksonville, FL 32207

NOTICE OF PERMIT ISSUANCE

JCP File Number: 0305363-001-BI and 002-BV
Applicant Name: U.S. Army Corps of Engineers
Project Name: Longboat Pass to Sunshine Skyway GIWW Maintenance Dredging

Dear Mr. Summa:

Your request for a Joint Coastal Permit, issued pursuant to Chapters 161 and 373, Florida Statutes, and Title 62, Florida Administrative Code, has been approved by the Department. Please read the enclosed permit and permit conditions closely before starting construction. Particularly note the permit conditions pertaining to written reports which must be submitted to the Department at specified times.

If you have any additional questions, please contact me at (850) 414-7796.

Sincerely,

Lainie Edwards, Ph.D.
Environmental Manager
Bureau of Beaches and Coastal Systems

Enclosures: Final Order
Variance

Issuance of Permit
JCP File Nos. 0305363-001-BI and 002-BV
Longboat Pass to Sunshine Skyway GIWW Maintenance Dredging
Page 2 of 2

Copies furnished to:

Paul Karch, USACE
Amanda Lavigne, USACE
James McAdams, USACE
Kathleen McConnell, USACE
Bill Vorstadt, DEP, Southwest District
Robbin Trindell, FWC
Anne Richards, FWC
Andy Squires, Pinellas County
Charlie Hunsicker, Manatee County
Juan Florensa, Town of Longboat Key
Charles Listowski, WCIND
Bruce A. Laurion, P.E, Tampa Port Authority

JCP Compliance Officer
Subarna Malakar, DEP BBCS
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BBCS Permit File



Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard, Jr.
Secretary

ENVIRONMENTAL RESOURCE PERMIT

PERMITTEE:

Eric P. Summa, Chief
Environmental Branch
U.S. Army Corps of Engineers
701 San Marco Blvd.
Jacksonville, FL 32207

PERMIT INFORMATION:

Permit Number: 0305363-001-BI

Project Name: Longboat Pass to Sunshine Skyway
GIWW Maintenance Dredging

Counties: Manatee, Pinellas and Hillsborough

Issuance Date: November 14, 2011

Expiration Date of Construction Phase: November 14,
2021

REGULATORY AUTHORIZATION:

This permit is issued under the authority of Part IV of Chapter 373, F.S., and Titles 40, Florida Administrative Code (F.A.C.). The activity is not exempt from the requirement to obtain an environmental resource permit. Pursuant to Operating Agreements executed between the Department of Environmental Protection (Department) and the water management districts, as referenced in Chapter 62-113, F.A.C., the Department is responsible for reviewing and taking final agency action on this activity.

PROJECT DESCRIPTION:

The project consists of periodic maintenance dredging of the Gulf Coast Intracoastal Waterway (GIWW) in the following areas: Longboat Pass Cut-2 and Cut-3, GIWW Cuts M-5, M-12 and M-14, and cuts SC-2 and SC-3 along the Sunshine Skyway. All dredged material will be placed approximately 1500-5000 linear feet from the Egmont Key shore, between -8 and -13 feet MLLW. The maximum dredging depths are -12 feet MLLW for the Longboat Pass Cuts and -11 feet MLLW for the GIWW and Sunshine Skyway Cuts. The volumes for each project area for the first dredging event are as follows: Longboat Pass cuts will have a total volume of 36,000 cubic yards; GIWW cuts will have a total volume of 77,400 cubic yards; and Sunshine Skyway cuts will have a total volume of 22,800 cubic yards. Future dredging events will not exceed a total volume of 200,000 cubic yards, and will require additional surveys of the placement area at Egmont Key to determine the available capacity.

**Environmental Resource Permit
Longboat Pass to Sunshine Skyway GIWW Maintenance Dredging
Permit No. 0305363-001-BI
Page 2 of 16**

The dredging will impact 0.34 acres of seagrass, which will be offset by 0.65 acres of seagrass mitigation in the form of prop scar recovery using seeded sediment tubes, signage and bird stakes in the Big Pass Estuary of Cockroach Bay.

PROJECT LOCATION:

The maintenance dredging activity is located within the GIWW federal Navigation channel from Longboat Pass to the Sunshine Skyway Bridge, in Manatee County, Hillsborough County, and Pinellas County, Sections 3, 10, 15, 21, 22, 26, 27, 28, and 34; Townships 31, 32, 33, 34 and 35 South, Ranges 16 and 19 East, Gulf of Mexico, Tampa Bay, Anna Maria Sound, Sarasota Bay, and Longboat Pass, Class II Waters (conditionally approved for shellfish harvesting) and Class III Waters, Boca Ciega Bay Aquatic Preserve, and Sarasota Bay Estuarine System, Outstanding Florida Waters. The disposal site is located in the nearshore area of Egmont Key, approximately 1500 - 5000 linear feet from the western shoreline, from R-7 to R-13, in Hillsborough County, Sections 23 and 26, Township 33 South, Range 15 East. The seagrass mitigation site is located in Cockroach Bay Aquatic Preserve, OFW, Hillsborough County.

PROPRIETARY AUTHORIZATION:

The Department acknowledges that maintenance dredging falls within one of the federal powers listed in the Submerged Lands Act under 43 USC 1311(d) or 43 USC 1314, and, under those provisions, the U.S. Army Corps of Engineers (Corps) needs no authorization from the Board of Trustees to utilize sovereignty submerged lands for that activity. However, under the provisions of the Coastal Zone Management Act (16 USC 1451-1465), this activity requires Florida's concurrence with a determination of consistency with the sovereignty submerged lands provisions of Florida's approved Coastal Management program prior to federal approval of the proposed activity. The State has determined that the activity is consistent with the sovereignty submerged lands provisions of Florida's approved Coastal Management program.

COASTAL ZONE MANAGEMENT:

This permit constitutes a finding of consistency with Florida's Coastal Zone Management Program, as required by Section 307 of the Coastal Zone Management Act.

WATER QUALITY CERTIFICATION:

Granting the associated variance to the antidegradation provisions in Rule 62-4.242(2)(a)2.b., F.A.C., authorizes the Permittee to exceed state water quality standards. Therefore, the Department hereby waives water quality certification pursuant to Section 401 of the Clean Water Act, 33 U.S.C. 1341.

AGENCY ACTION:

The above named Permittee is hereby authorized to construct the work outlined in the above Project Description, the approved permit drawings, and other approved documents attached hereto or on file with the Department and made a part hereof. **This permit is subject to**

Environmental Resource Permit
Longboat Pass to Sunshine Skyway GIWW Maintenance Dredging
Permit No. 0305363-001-BI
Page 3 of 16

the limits, conditions, and locations of work shown in the attached drawings, and is also subject to the attached General Conditions and Specific Conditions, which are a binding part of this permit. You are advised to read and understand these drawings and conditions prior to commencing the authorized activities, and to ensure the work is conducted in conformance with all the terms, conditions, and drawings. If you are utilizing a contractor, the contractor also should read and understand these drawings and conditions prior to commencing the authorized activities. Failure to comply with all drawings and conditions shall constitute grounds for revocation of the permit and appropriate enforcement action.

GENERAL CONDITIONS:

1. This permit, including its general and specific conditions, must be construed in light of the February 28, 2006 Interagency Coordination Agreement for Civil Works Projects (ICA) between the Department and the Corps. As recognized in the ICA, the Department has the authority to include reasonable conditions in this permit. All of the conditions in this permit, both general and specific, are enforceable to the extent sovereign immunity has been waived under 33 U.S.C. §§ 1323 and 1344(t). The ICA is incorporated herein by reference.
2. All activities approved shall be implemented as set forth in the drawings incorporated by reference and in compliance with the conditions and requirements of this document. The Corps shall notify the Department in writing of any anticipated changes in:
 - a) operational plans;
 - b) project dimensions, size or location;
 - c) ability to adhere to permit conditions;
 - d) project description included in the permit;
 - e) monitoring plans.

If the Department determines that a modification to the permit is required then the Corps shall apply for and obtain the modification. Department approval of the modification shall be obtained prior to implementing the change, unless the change is determined by the Department to reduce the scope of work from that authorized under the original permit, and will not affect compliance with permit conditions or monitoring requirements.

3. If, for any reason, the Corps does not comply with any condition or limitation specified herein, the Corps shall immediately provide the Department with a written report containing the following information:
 - a) a description of and cause of noncompliance;
 - b) the period of noncompliance, including dates and times;
 - c) impacts resulting or likely to result from the non-compliance;

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- d) steps being taken to correct the non-compliance; and
- e) the steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

Compliance with the provisions of this condition shall not preclude the Department from taking any enforcement action allowed under state law with respect to any non-compliance.

4. The Corps shall obtain any applicable licenses, permits, or other authorizations which may be required by federal, state, local or special district laws and regulations. Nothing herein constitutes a waiver or approval of other Department permits or authorizations that may be required for other aspects of the total project.
5. Nothing herein conveys to the Corps or creates in the Corps any property right, any interest in real property, any title to land or water, constitutes State recognition or acknowledgment of title, or constitutes authority for the use of Florida's sovereign submerged lands seaward of the mean high-water line or an established erosion control line, unless herein provided, and the necessary title, lease, easement, or other form of consent authorizing the proposed use has been obtained from the State.
6. Any delineation of the extent of a wetland or other surface water submitted as part of the application, including plans or other supporting documentation, shall not be considered specifically approved unless a specific condition of this authorization or a formal determination under section 373.421(2), F.S., provides otherwise.
7. Nothing herein authorizes any entrance upon or activities on property which is not owned or controlled by the Corps or local sponsor, or conveys any vested rights or any exclusive privileges.
8. This document or a copy thereof, complete with all conditions, attachments, modifications, and time extensions shall be kept at the work site of the authorized activity. The Corps shall require the contractor to review this document prior to commencement of the authorized activity.
9. The Corps specifically agrees to allow Department personnel with proper identification, at reasonable times and in compliance with Corps specified safety standards access to the premises where the authorized activity is located or conducted for the purpose of ascertaining compliance with the terms of this document and with the rules of the Department and to have access to and copy any records that must be kept; to inspect the facility, equipment, practices, or operations regulated or required; and to sample or monitor any substances or parameters at any location reasonably necessary to assure compliance. Reasonable time may depend on the nature of the concern being investigated.

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10. At least forty-eight (48) hours prior to the commencement of authorized activity, the Corps shall submit to the Department a written notice of commencement of activities indicating the anticipated start date and the anticipated completion date.
11. If historic or archaeological artifacts such as, but not limited to, Indian canoes, arrow heads, pottery or physical remains, are discovered at any time on the project site, the Corps shall immediately stop all activities in the immediate area which disturb the soil and notify the Department and the State Historic Preservation Officer. In the event that unmarked human remains are encountered during permitted activities, all work shall stop in the immediate area and the proper authorities notified in accordance with Section 872.05, *Florida Statutes*.
12. Within a reasonable time after completion of construction activities authorized by this permit, the Corps shall submit to the Department a written statement of completion. This statement shall notify the Department that the work has been completed as authorized and shall include a description of the actual work completed. The Department shall be provided, if requested, a copy of any as-built drawings required of the contractor or survey performed by the Corps.

SPECIFIC CONDITIONS:

1. No work shall be conducted until and unless the Department issues a Final Order of Variance (File No. 0305363-002-BV) from Rule 62-4.244(5)(c), F.A.C. to establish an expanded mixing zone, and Rule 62-4.242(2)(a)2.b., F.A.C., to establish a maximum allowable turbidity level above background for work within Outstanding Florida Waters (OFW) for this project.
2. All reports or notices relating to this permit shall be sent to the DEP, Bureau of Beaches and Coastal Systems, JCP Compliance Officer, 3900 Commonwealth Boulevard, Mail Station 300, Tallahassee, Florida 32399-3000 (e-mail address: JCPCCompliance@dep.state.fl.us).
3. The Permittee shall not store or stockpile tools, equipment, materials, etc., in the upland without prior coordination with the Department, and shall not do so within wetlands or surface waters of the state without a permit modification. Storage, stockpiling or access of equipment on, in, over or through seagrass (or other aquatic vegetation) beds, or wetlands is prohibited unless within a work area or ingress/egress corridor specifically approved by this permit. Anchoring or spudding of vessels and barges (other than the operating dredge) within beds of aquatic vegetation is also prohibited.
4. Anchoring or spudding of the dredge within beds of aquatic vegetation shall be avoided to the maximum extent practicable. If this is unavoidable, the location of each point where a spud, anchor or anchor line is placed within beds of aquatic vegetation shall be

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recorded using DGPS, and the sites shall be evaluated for resource damage after construction.

5. **Pre-Construction Conference.** The Permittee shall conduct a pre-construction conference to review the specific conditions and monitoring requirements of this permit with Permittee's contractors, the engineer of record and the JCP Compliance Officer (or designated alternate) prior to each construction event. In order to ensure that appropriate representatives are available, at least twenty-one (21) days prior to the intended commencement date for the permitted construction, the Permittee is advised to contact the Department, and the other agency representatives listed below:

DEP, Bureau of Beaches & Coastal Systems
JCP Compliance Officer
Mail Station 300
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000
phone: (850) 414-7716
e-mail: JCP.Compliance@dep.state.fl.us

DEP Southwest District Office
Submerged Lands & Environmental Resources
13051 N Telecom Pkwy
Temple Terrace, FL 33637
(813) 632-7600

Imperiled Species Management Section
Florida Fish & Wildlife Conservation Commission (FWC)
620 South Meridian Street
Tallahassee, Florida 32399-1600
phone: (850) 922-4330
fax: (850) 921-4369 or email: marine.turtle@myfwc.com

The Permittee is also advised to schedule the pre-construction conference at least one week prior to the intended commencement date. At least seven (7) days in advance of the pre-construction conference, the Permittee shall provide written notification, advising the participants (listed above) of the agreed-upon date, time and location of the meeting, and also provide a meeting agenda and a teleconference number.

6. **Pre-Construction Submittals.** At least fourteen (14) days prior to the date of the pre-construction conference, the Permittee shall submit the following:

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- a. Final plans and specifications for this project, which must be consistent with the project description of this permit and the approved permit drawings. The Permittee shall point out any deviations from the project description or the approved permit drawings, and any significant changes would require a permit modification. Submittal shall include one (1) hardcopy (sized 11 inches by 17 inches or greater, with all text legible) and one (1) electronic copy of the final plans and specifications. The plans and specifications shall be accompanied by a letter indicating the project name, the permit number, the type of construction activity, the specific type of equipment to be used, the anticipated volume of material to be moved (if applicable) and the anticipated schedule. The final plans and specifications submitted under this condition must comply with all conditions set forth in this permit.
 - b. ***Turbidity Monitoring Qualifications.*** Construction and any in-water transportation or rehandling of dredged material shall be monitored closely by an experienced person, to assure that turbidity levels do not exceed the compliance standards. Also, an individual familiar with the dredging techniques being used for this project, and with turbidity monitoring shall be present during daylight hours. This individual shall have authority to alter construction techniques or shut down the dredging or nearshore disposal operations if turbidity levels exceed the compliance standards. The people responsible for conducting or supervising the turbidity monitoring shall have professional experience in monitoring turbidity for Joint Coastal Permits without a record of permit violations. The names, qualifications and records of those individuals performing these functions, along with 24-hour contact information, shall be submitted to the Department.
 - c. As the lands in Hillsborough County are controlled by the Tampa Port Authority, evidence must be submitted to the Department than the Port is aware of the activities occurring on their managed lands.
 - d. As some of the dredging occurs in Class II conditionally approved shellfish harvesting areas, evidence must be submitted to the Department prior to each dredging event that coordination with the Florida Department of Agriculture and Customer Services; Division of Aquaculture has occurred. The Division of Aquaculture office number is 941-833-2552, and they must be contacted at least 48 hours prior to dredging in order to notify the commercial shellfish harvesters in the area prior to the dredging.
7. In order to minimize the potential for elevated turbidity in Outstanding Florida Waters, the Permittee shall employ best management practices during the dredging, transportation and disposal activities.

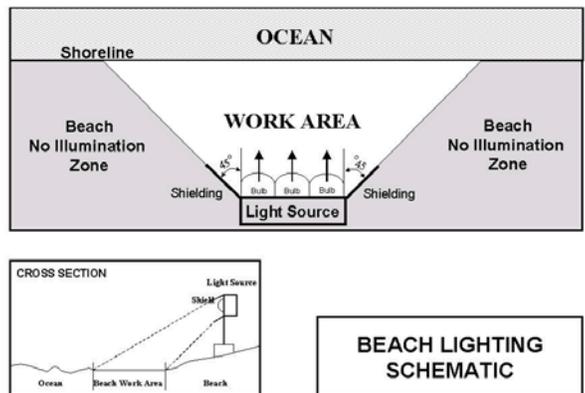
Standard Construction Conditions for Manatees and Marine Turtles

8. The Permittee shall comply with the following conditions intended to protect manatees and marine turtles from direct project effects:
 - a. All personnel associated with the project shall be instructed about the presence of marine turtles, manatees and manatee speed zones, and the need to avoid collisions with (and injury to) these protected marine species. The Permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.
 - b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels shall follow routes of deep water whenever possible.
 - c. Siltation or turbidity barriers shall be made of material in which manatees and marine turtles cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee or marine turtle movement.
 - d. All on-site project personnel are responsible for observing water-related activities for the presence of marine turtles and manatee(s). All in-water operations, including vessels, shall be shutdown if a marine turtle or manatee comes within 50 feet of the operation. Activities shall not resume until the animal(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the animal(s) has not reappeared within 50 feet of the operation. Animals shall not be herded away or harassed into leaving.
 - e. Any collision with or injury to a marine turtle or manatee shall be reported immediately to the FWC Hotline at 1-888-404-3922, and to FWC at ImperiledSpecies@myFWC.com. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service (FWS) for north Florida, Jacksonville Office at 1-904-731-3336 or for south Florida, Vero Beach Office at 1-772-562-3909.
 - f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs shall be removed by the Permittee upon completion of the project. Temporary signs that have already been approved for this use by the FWC must be used. One sign, which reads *Caution: Boaters*, shall be posted. A second sign measuring at least 8 ½" by 11", explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations, shall be posted in a location prominently visible to all personnel engaged in water-related activities.

These signs can be viewed at MyFWC.com/manatee. Questions concerning these signs can be sent to the email address listed above.

Additional Marine Turtle Protection Conditions

9. **Project Lighting.** Lighting on offshore or onshore equipment shall be minimized through reduction, shielding, lowering, and appropriate placement to avoid excessive illumination of the water's surface and nesting beach while meeting all Coast Guard, EM 385-1-1, and OSHA requirements. Light intensity shall be reduced to the minimum standard required by OSHA for General Construction areas, in order not to misdirect sea turtles. Shields shall be affixed to the light housing and be large enough to block light from all lamps from being transmitted outside the construction area, as illustrated below.



MITIGATION:

10. As Mitigation for the 0.34 acres of seagrass impacts from the channel dredging, 0.65 acres of prop scar and blowout hole mitigation, in the Big Pass Estuary of Cockroach Bay, shall be required in the growing season following construction. Only the acreage of the actual prop scar or blowout hole (injury sites) shall be used in calculating the 0.65 acres. Injury sites shall be restored using pre-seeded sediment tubes, and signage (if authorized by FWC) may be used to facilitate the recovery of the area. Sediment Tube® technology shall be used to restore the prop scar areas. Informational signage that has been approved by FWC may also be erected to warn boating communities of shallow water, and reduce potential groundings.

Reference sites will be established adjacent to the mitigation sites, and used to establish success criteria (coverage and density) for this restoration project. Reference sites shall be undisturbed sites with established seagrass beds, so a comparison to the mitigation sites can determine if background impacts exist that are not related to the injury or failure

of the restoration activity, such as degraded water quality or disease affecting natural recolonization or sprouting of seeded plants.

Monitoring of mitigation areas is required, per specific condition 16. The approved mitigation plan, accepted on August 12, 2011, is attached to this permit.

MONITORING REQUIRED:

Seagrass Monitoring for Secondary Impacts Adjacent to the Channel

11. In order to determine the extent of project-related seagrass impacts beyond the dredge channel, the seagrass areas identified as impact areas in the preconstruction seagrass survey shall be resurveyed within 50 feet of the channel edge using the same established transects and sampling techniques as utilized for the preconstruction survey. The location of each point where a spud, anchor or anchor line is placed within beds of aquatic vegetation shall also be evaluated for resource damage after construction. Seagrass beds located between transects shall be visually assessed, and representative quadrat data shall be collected for the bed, and measurements taken for mapping purposes.
 - a. Seagrass bed edges shall be recorded using the line – intercept method, and mapped following construction in the same timeframe (season) as the initial mapping. During mapping of the seagrasses, the biologist shall note seagrass species, and DGPS positioning shall be recorded for changes in species along the edges. Areas affected by anchoring, spudding, shoaling, sloughing scouring, sedimentation or turbidity will be evaluated and quantified to determine the extent to which the limit of seagrass coverage has changed in response to the physical change and will be evaluated in conjunction with the results of the biological monitoring. Seagrass polygons shall be developed to determine spatial coverage from the mapping data.
 - b. Every 5 meters along transects where seagrasses are present, point-quadrat sampling shall be used to assess percent cover, determine species composition, and facilitate qualitative descriptions. Quadrats measuring 1 meter x 1 meter shall be subdivided into 100, 10 cm x 10 cm plots, to be used for this assay. Percent cover shall be visually estimated using a modified Braun – Blanquet abundance scale.
 - c. ***Biological Monitoring Qualifications:*** The individuals who will be conducting the biological monitoring shall be certified SCUBA divers, shall have professional experience in conducting seagrass monitoring surveys, and shall have a BS degree or higher in marine biology. The names and qualifications of those individuals performing these functions shall be submitted to the Department.

12. The post construction survey shall be submitted to the Department within 90 days of survey. The report shall report and summarize the monitoring data, noting any project-related impacts. The report shall contain an analysis of secondary impacts based upon the results of the biological monitoring. Seagrass mapping in addition to the line-intercept data, coupled with the point quadrat data across the transect lines, shall be submitted to provide detailed information regarding impacts to seagrasses within 50 feet of the channel dredging area. Areas shall be quantified to determine the extent to which the limit of seagrass coverage has changed and any areas where seagrass have been damaged or degraded.
13. In the event more impacts have occurred from the project than the originally estimated 0.34 acres of impact, additional mitigation shall be provided. As the post construction survey will occur within the first year of construction, the Permittee shall submit the location of where the additional prop scar mitigation will occur, or submit an alternate mitigation plan.

Mitigation Monitoring

14. ***Aerial mapping.*** At the mitigation site, aerial mapping shall be conducted by the Corps' unmanned aerial vehicle (UAV) equipped with high-resolution (Olympus 10-megapixel digital single lens reflex camera). The UAV shall be flown at an elevation of around 50-feet above the water in transects that overlap by 60%. The aerial shall be calibrated as needed and ortho-rectified to compose a seamless mosaic with coverage of the entire study area, including all the individual restored injury sites. Aerial photo-interpretation shall be used to confirm new growth of seagrass species, in contrast to exposed sediment tubes within the restored injury sites.
15. ***Ground truthing.*** Diver surveys shall be conducted along the axis of the injury site to ground-truth data generated by the aeriels and to assess the area. DGPS positions of these locations shall be recorded. A diver shall swim the centerline of the axis noting the linear extent of substrate within a 1-meter wide area. Any scour, injury or growth-prohibiting conditions shall be noted and recorded. Point-intercept quadrat samples shall be taken and evaluated to describe seagrass coverage, and document changes in bed density, as well as species composition.

A number of point-intercept quadrat samples (enough to comprise 5% of the restoration area for each injury site) taken at randomly generated points, shall be evaluated in selected locations within the restoration area. A sufficient number of samples shall be taken to fully represent the restored injury sites. A modified Braun-Blanquet visual assessment method shall be used at each location, in order to assess species composition for single or mixed species, and photographs or video of each location shall also be taken. New random sites shall be generated prior to each monitoring event.

16. ***Measurement of shoot growth development.*** The density of aerial coverage by developing shoot growth shall be evaluated within the restoration site(s) as well as adjacent reference site(s). This will compare the density of an area (based on the fraction of the quadrat dominated by a particular species when viewed directly from above) to the amount of shoot growth (determined by counts of shoots within a 25-cm x 25-cm subplot, placed within the 50-cm x 50-cm standard quadrat).
17. ***Success Criteria.*** The mitigation site shall be monitored for the following success criteria.
 1. Aerial coverage of seagrass within the restoration site shall be within 15% of that in reference site within the first 6 months of reestablishment.
 2. After 12 months of post-construction, the areal coverage within the restoration site shall be 45% of vegetative coverage overall.
 3. At the end of the second year, the restoration site shall achieve a total of 85% coverage for success determination.

A success determination will be accomplished by considering counts of plant shoots and an estimation of percent coverage within sample quadrats to determine density and percent coverage (in contrast to bare areas). The success criteria for vegetation establishment within restored areas include Braun-Blanquet scores within 1 unit of reference site. Additionally, if indicators determine that success criteria are not being met, and that the restoration is determined to be failing, contingency measures as part of the Adaptive Management Plan shall be implemented.

18. ***Adaptive Management Plan.*** In the event that restoration measures fail to meet the goals as established by the success criteria, as documented by monitoring event data, adaptive management measures shall be enacted. These measures may include:
 1. Replace sediment tubes that have not stabilized the injury site(s), as indicated by the lack of seagrass seedling sprout or shoot growth, loss of areal coverage by target species, subsidence, or subsequent injury to sediment tubes or substrate.
 2. Replant seagrass species by shoot transplanting or re-seeding.
 3. Utilize additional injury sites that show more promise of successful establishment than those currently in use.
 4. Additional monitoring events or prolonged schedule until success criteria are achieved.

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19. **Monitoring Schedule.** The mitigation monitoring schedule shall occur according to the following schedule:

- a. Immediately following restoration of the site;
- b. Semi-annually during the first year (6 and 12 months);
- c. Semi-annually during the second year (6 and 12 months); and
- d. Annually for year three (12 months after the 12 month year-two survey).

Reports are required to be submitted to the Department within 90 days of each survey completion. Aerial photography, in addition to the qualitative and quantitative data collected shall be summarized, evaluated and discussed in the report.

Should the system fail to reestablish seagrass colonization at the expected rate, and contingency measures are implemented, the monitoring event schedule shall start over to a semi-annual survey for a period of at least one year following the adaptations for those sites requiring additional attention. If additional annual monitoring events are required, these could be conducted for up to five years as necessary. If the mitigation has not achieved success by the end of the monitoring, a new mitigation plan shall be proposed.

20. **Water Quality Monitoring**

Units: Nephelometric Turbidity Units (NTUs).

Frequency: Twice daily at least four hours apart during all dredging and sand placement operations, when the heaviest turbidity crosses the edge of the mixing zone.

Location: **Background:** At mid-depth clearly outside the influence of any artificially generated turbidity plume, approximately 300 meters in the opposite direction of the prevailing current flow.

Compliance: At mid-depth, within the densest portion of any visible turbidity plume generated by this project.

Dredge Site SC-3, M-14, M-12, M-5, LB -2 and LB-3 (in OFW): Samples shall be collected 300 meters downcurrent from the dredge head, in the densest portion of any visible turbidity plume.

Dredge Site SC-2 (not in OFW): Samples shall be collected 150 meters downcurrent from the dredge head, in the densest portion of any visible turbidity plume.

Nearshore Disposal Site (not OFW): Samples shall be collected 150 meters downcurrent from the point of discharge.

Intermediate Monitoring Stations in OFW: Mid-depth, approximately concurrent with the compliance monitoring, within the densest portion of any visible turbidity plume, 150 meters downcurrent from the source of turbidity. These measurements are not for compliance purposes, but rather will be used to calibrate the size of the mixing zone for future events.

The **compliance** locations given above shall be considered the limits of the temporary mixing zone for turbidity allowed during construction. If monitoring reveals turbidity levels at the **compliance** sites that are greater than **7 NTUs** above the corresponding background turbidity levels within Outstanding Florida Waters (Cut SC-3, M-14, M-12, M-5, LB -2 and LB-3), or are greater than **29 NTUs** outside of Outstanding Florida Waters (Cut SC-2 and nearshore placement at Egmont Key), construction activities shall **cease immediately** at the site and not resume until corrective measures have been taken and turbidity has returned to acceptable levels. Any such occurrence shall also be immediately reported to the Department's Bureau of Beaches and Coastal Systems (BBCS) in Tallahassee at (850) 414-7716 (attn: JCP Compliance Officer), and any occurrences in Class II waters (Boca Ciega Aquatic Preserve, cuts SC-2 and SC-3, and portions of M-5 in Sarasota Bay) must be also reported to the Florida Department of Agriculture and Customer Services; Division of Aquaculture at 941-833-2552.

Turbidity Reports. All turbidity monitoring data shall be submitted within one week of analysis, along with documents containing the following information:

- a. time of day samples were taken;
- b. dates of sampling and analysis;
- c. depth of water body;
- d. depth of each sample;
- e. antecedent weather conditions, including wind direction and velocity;
- f. tidal stage and direction of flow;
- g. water temperature;
- h. a map indicating the sampling locations;

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- i. a statement describing the methods used in collection, handling, storage and analysis of the samples;
- j. a statement by the individual responsible for implementation of the sampling program concerning the authenticity, precision, limits of detection, calibration of the meter and accuracy of the data.

Monitoring reports shall be submitted to the BBCS in Tallahassee (attn: JCP Compliance Officer). Failure to submit reports in a timely manner constitutes grounds for revocation of the permit. When submitting this information to the Department, on the submittal cover page and at the top of each page of the report, please state: "This information is provided in partial fulfillment of the monitoring requirements in Permit No. 0305363-001-BI, for the Longboat Pass to Sunshine Skyway GIWW Maintenance Dredging Project."

Calibration: The instruments used to measure turbidity shall be fully calibrated prior to, but within one month of, the commencement of the project, and at least once a month throughout the project. Calibration shall be verified each morning prior to use, and after each time the instrument is turned on, using a turbidity "standard" that is different from the one used during calibration.

- 21. If there is a conflict between the project description, the permit conditions, the approved permit drawings, the attached plans or other approved documents, the specific conditions shall prevail, followed by the project description, and then the permit drawings.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION



Gene Chalecki, P.E., Acting Chief
Bureau of Beaches and Coastal Systems



Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard Jr.
Secretary

FINAL ORDER OF VARIANCE

GRANTEE:

Eric P. Summa, Chief
Environmental Branch
U.S. Army Corps of Engineers
701 San Marco Blvd.
Jacksonville, FL 32207

PROJECT INFORMATION:

Variance No. 0305363-002-BV
Date of Issue: November 14, 2011
Expiration Date: Same as expiration date of Permit
No. 0305363-001-BI
County: Manatee, Pinellas and Hillsborough
Project: Longboat Pass to Sunshine Skyway GIWW
Maintenance Dredging

FINAL ORDER BY THE DEPARTMENT:

The Department of Environmental Protection (Department) hereby grants, to the U.S. Army Corps of Engineers (Corps), a variance from the requirements of Rule 62-4.244(5)(c), Florida Administrative Code (F.A.C.), to establish a temporary mixing zone greater than 150 meters and from Rule 62-4.242(2)(a)2.b., F.A.C., to provide relief from the antidegradation requirement for turbidity in Outstanding Florida Waters (OFW).

This variance will temporarily establish an expanded mixing zone of 300 meters for the dredging sites in OFW and a maximum allowable turbidity level of 7 NTUs above background at the edge of the mixing zone within OFW. This temporary variance shall only be valid during the construction activities authorized in Permit No. 0305363-001-BI and shall expire when the permit expires on November 10, 2021, unless the permit is modified to grant a time extension.

The associated joint coastal permit (No. 0305363-001-BI) is to The proposed project consists of periodic maintenance dredging of the Gulf Coast Intracoastal Waterway (GIWW) in the following areas: Longboat Pass Cut-2 and Cut-3, GIWW Cuts M-5, M-12 and M-14, and cuts SC-2 and SC-3 along the Sunshine Skyway. All dredged material will be placed approximately 1500-5000 linear feet from the Egmont Key shore, between -8 and -13 feet MLLW. The maximum dredging depths are -12 feet MLLW for the Longboat Pass Cuts and -11 feet MLLW for the GIWW and Sunshine Skyway Cuts. The volumes for each project area for the first dredging event are as follows: Longboat Pass cuts will have a total volume of 36,000 cubic yards; GIWW cuts will have a total volume of 77,400 cubic yards; and Sunshine Skyway cuts will have a total volume of 22,800 cubic yards. Future dredging events will not exceed a

total volume of 200,000 cubic yards, and will require additional surveys of the placement area at Egmont Key to determine the available capacity.

The dredging will impact 0.34 acres of seagrass, which will be offset by 0.65 acres of seagrass mitigation in the form of prop scar recovery using seeded sediment tubes, signage and bird stakes in the Big Pass Estuary of Cockroach Bay.

After reviewing the Petition for Variance, the Department concluded that it satisfied the requirements and criteria set forth in Section 403.201, Florida Statutes (F.S.), and Rule 62-110, F.A.C.

The *Notice of Intent to Issue Environmental Resource Permit and Variance* notified the Corps of the Department's proposed agency action and advised them of their right to a hearing pursuant to Sections 120.569 and 120.57, F.S. On October 6, 2011, notice was given in *St. Petersburg Times* and on October 7, 2011, notice was given in the Florida Administrative Weekly informing the public of the Department's intended action and offering an opportunity for hearing pursuant to Sections 120.569 and 120.57, F.S. A copy of the notice is attached as Exhibit A.

The Grantee and interested parties having been advised of their rights under Chapter 120, F.S., and having failed or declined to file a Petition pursuant to Sections 120.569 and 120.57, F.S., are hereby deemed to have waived those rights. Acceptance of the variance constitutes notice and agreement that the Department will periodically review this variance for compliance, including site inspections where applicable, and may initiate enforcement action for violation of the conditions and requirements thereof. It is therefore:

ORDERED by the State of Florida, Department of Environmental Protection, that the Petition of the **Corps** requesting a variance be and is hereby granted, subject to the conditions specified by the Department in Permit No. 0305363-001-BI.

The variance shall also be subject to the following conditions:

1. Best management practices and technology shall be employed to minimize turbidity within the OFW.

Any Party to this Order has the right to seek judicial review of the Order Pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of the Appellate Procedure, with the clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this Order is filed with the clerk of the Department.

DONE AND ORDERED this 14th day of November, 2011, in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION



Gene Chalecki, P.E., Acting Bureau Chief
Bureau of Beaches and Coastal Systems

Attachment: Exhibit A (Variance Notices)

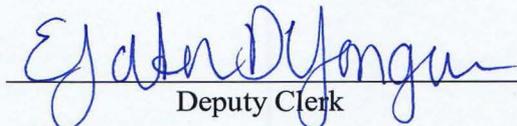
Copies furnished to:

Paul Karch, USACE
Amanda Lavigne, USACE
James McAdams, USACE
Kathleen McConnell, USACE
Bill Vorstadt, DEP, Southwest District
Robbin Trindell, FWC
Anne Richards, FWC
Andy Squires, Pinellas County
Charlie Hunsicker, Manatee County
Juan Florensa, Town of Longboat Key
Charles Listowski, WCIND
Bruce A. Laurion, P.E, Tampa Port Authority

JCP Compliance Officer
Subarna Malakar, DEP BBCS
Robert Brantly, DEP BBCS
Jennifer Koch, DEP BBCS
Catherine Florko, DEP BBCS
Roxane Dow, BBCS
Paden Woodruff, BBCS
Alex Reed, BBCS
Steve West, DEP BBCS
Chad Evers, FL DACS
BBCS Permit File

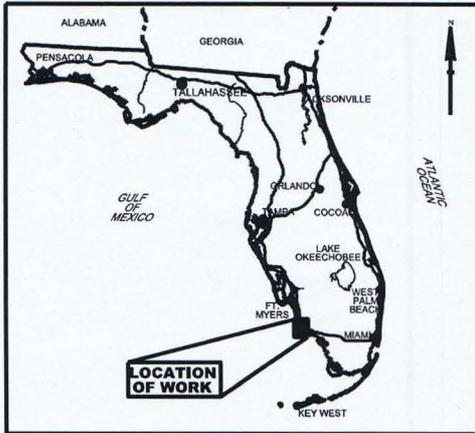
FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to Section 120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

 11/14/11
Deputy Clerk Date

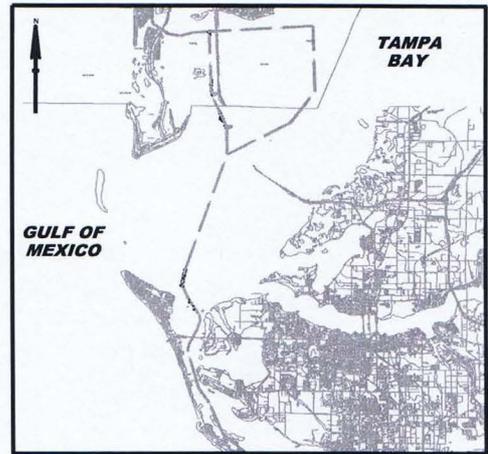
Prepared by: Lainie Edwards, Ph.D.

GIWW CR - AR (CUTS M-5, M-12, M-14, SC-2, SC-3) LONBOAT PASS (CUTS 2 & 3) MAINTENANCE DREDGING FY11



PROJECT LOCATION

N.T.S.



PROJECT VICINITY

N.T.S.

INDEX TO DRAWINGS

PLATE	TITLE
1	GENERAL NOTES, INDEX TO DRAWINGS, LEGEND AND LOCATION MAPS
2	PROJECT VICINITY MAP
3	LONGBOAT CUT-2 & CUT-3 - STA. 11+00 (CUT-2) - STA. 4+82.8 (CUT-3)
4	LONGBOAT CUT-3 - STA. 4+82.8 - STA. 23+00
5	LONGBOAT CUT-3 - STA. 23+00 - STA. 40+48.20
6	CUT M-5 - STA. 0+00 - STA. 6+00
7	CUT M-5 - STA. 6+00 - STA. 23+00
8	CUT M-5 - STA. 23+00 - STA. 40+00
9	CUT M-5 - STA. 40+00 - STA. 58+00
10	CUT M-12 - STA. 14+00 - STA. 31+00
11	CUT M-12 - STA. 31+00 - STA. 45+00
12	CUT M-14 - STA. 0+00 - STA. 17+00
13	CUT M-14 - STA. 17+00 - STA. 34+25.03
14	CUT SC-2 - STA. 0+00 - STA. 9+00
15	CUT SC-2 - STA. 9+00 - STA. 26+00
16	CUT SC-2 - STA. 26+00 - STA. 43+00
17	CUT SC-3 - STA. 0+00 - STA. 12+00
18	CUT SC-3 - STA. 12+00 - STA. 30+00
19	CUT SC-3 - STA. 30+00 - STA. 47+00
20	TYPICAL CROSS SECTIONS
21	EGMONT KEY - NEARSHORE DREDGED MATERIAL PLACEMENT AREA
22	MIXING ZONE MAP

ABBREVIATIONS:

APPROX.	= APPROXIMATE
DMMA	= DREDGED MATERIALS MANAGEMENT AREA
DWG.	= DRAWING
EL.	= CENTERLINE
Q.	= ELEVATION
EQ.	= EQUALLY
FT.	= FOOT/FEET
MLLW.	= MEAN LOWER LOW WATER
NAD83.	= NORTH AMERICAN DATUM OF 1983
NAVD88.	= NORTH AMERICAN VERTICAL DATUM OF 1988
NTS.	= NOT TO SCALE
RGE.	= RANGE
STA.	= STATIONING
SPA.	= SPACED
TYP.	= TYPICAL
USACE.	= UNITED STATES ARMY CORPS OF ENGINEERS
USCG.	= UNITED STATES COAST GUARD

LEGEND:

	- PROJECT CHANNEL
	- PROPOSED DREDGE AREA
	- PROJECT DEPTH
	- TYPICAL SEAGRASS AREA
	- NAVIGATION AIDS
	- SEAGRASS IMPACTED AREAS WITHIN NAVIGATION CHANNEL
	- VIBRACORE/CORE BORINGS SAMPLE DESIGNATION & LOCATION
	- CONTOURS / DEPTHS
	- APPROXIMATE LIMITS OF DREDGING

GENERAL NOTES

1. SURVEYS WERE CONDUCTED FROM 23 TO 28 SEPTEMBER 2010 BY DIAL CORDY AND ASSOCIATES, INC. STUDY AREA IS TOTALLY ENCOMPASSED IN THE PROJECT AREA.
2. LONGBOAT CUTS 2 AND 3, GIWW CUTS M-5, M-12 AND M-14 AND SUNSHINE SKYWAY CUT SC-3 ARE ALL WITHIN OUTSTANDING FLORIDA WATERS. REFER TO AERIAL FIGURES 1-3 IN TAB 'F' OF PERMIT PACKAGE.
3. SUNSHINE SKYWAY CUT SC-3 IS LOCATED WITHIN AN AQUATIC PRESERVE. REFER TO AERIAL FIGURE 3 IN TAB 'F' OF PERMIT PACKAGE.

PERMIT # 305363001



US Army Corps
of Engineers
Jacksonville District

PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FILE NAME:
GIWWFY11-C-PL-01.DGN
DATED:
MARCH 2011
SCALE:
AS SHOWN

DWN BY:
J.D.B.
DSN BY:
J.D.B.
CKD BY:
J.T.M.

GIWW CR - AR (CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3)
PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL

MAINTENANCE DREDGING FY11
9-FOOT PROJECT

**GENERAL NOTES, ABBREVIATIONS, INDEX TO
DRAWINGS, LEGEND AND LOCATION MAPS**

PLATE:

1

OF 22



**PINELLAS COUNTY
HILLSBOROUGH COUNTY**

GULF OF MEXICO

EGMONT KEY

EGMONT KEY NEARSHORE
DREDGED MATERIAL
PLACEMENT AREA

MULLET KEY
FT. DESOTO
**HILLSBOROUGH COUNTY
MANATEE COUNTY**

TAMPA BAY

**PINELLAS COUNTY
HILLSBOROUGH COUNTY**

CUT M-14

CUT M-12

WEST
BRADENTON

ANNA MARIA
ISLAND

NOTE: REFER TO AERIAL
FIGURE OF EGMONT KEY IN
TAB 'C' OF PERMIT PACKAGE.

LONGBOAT PASS
CUT-2 AND CUT-3

**SARASOTA
BAY**

GRAPHIC SCALE

6000' 0 6000' 12000'

PERMIT # 305363001



US Army Corps
of Engineers
Jacksonville District

**PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)**

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FILE NAME:
GIWWFY11-C-PL-02.DGN

DATED:
MARCH 2011

SCALE:
AS SHOWN

DWN BY:
J.D.B.

DSN BY:
J.D.B.

CKD BY:
J.T.M.

GIWW CR - AR (CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3)
PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL

**MAINTENANCE DREDGING FY11
9-FOOT PROJECT**

PROJECT VICINITY MAP

PLATE:

2

OF 22

PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FILE NAME: GIWWWFY11-C-PL-03.DGN
DATE: MARCH 2011
SCALE: AS SHOWN

DWN BY: J.D.B.
DSN BY: J.D.B.
CWD BY: J.T.M.

GIWW CR - AR CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3)
PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL

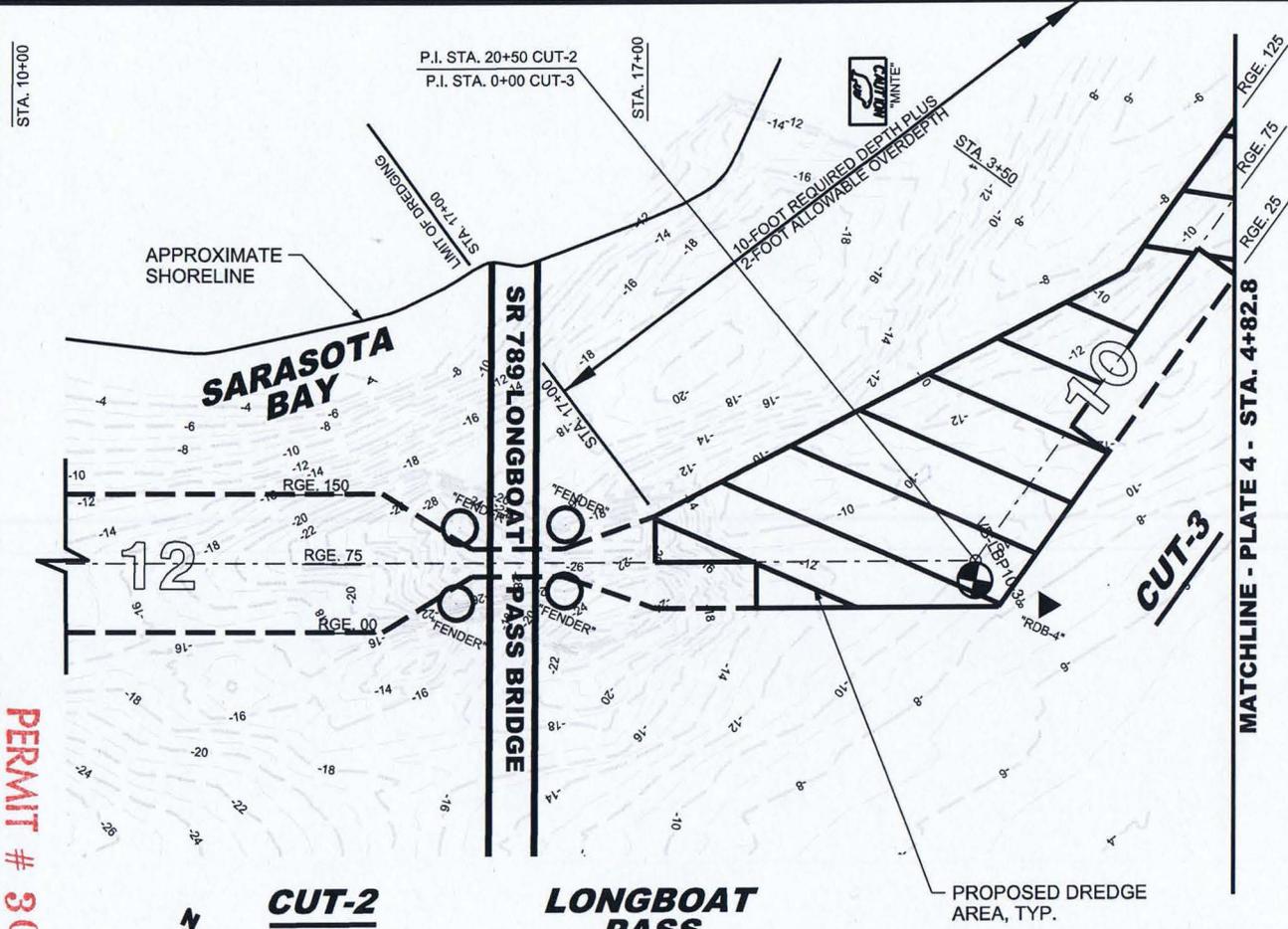
MAINTENANCE DREDGING FY11

9-FOOT PROJECT

LONGBOAT CUT-2 & CUT-3
STA. 11+00 (CUT-2) - STA. 4+82.8 (CUT-3)

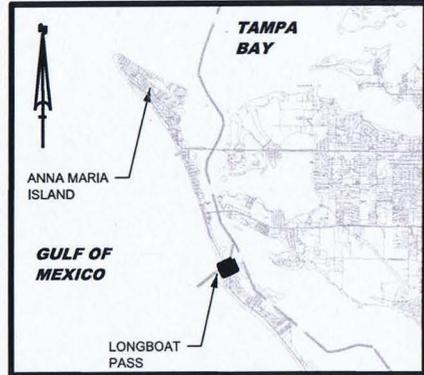
PLATE:
3

OF 22



PERMIT # 305363001

- NOTES:**
1. REFER TO SURVEY NO. 11-021.
 2. SEE THIS PLATE FOR SURVEY NOTES.
 3. SEE PLATE 1 FOR GENERAL NOTES AND LEGEND



KEY PLAN
NOT TO SCALE

- SURVEY NOTES:**
1. REFER TO SURVEY NO. 11-021.
 2. ELEVATIONS ARE IN FEET AND TENTHS AND REFER TO NOAA'S REPORTED MEAN LOWER LOW WATER (MLLW) OF THE 1983-2001 TIDAL EPOCH.
 3. ALL ELEVATIONS ARE BELOW THE CHART DATUM UNLESS PRECEDED BY A (+) SIGN.
 4. TIDAL REDUCTIONS WERE OBTAINED UTILIZING REAL-TIME KINEMATIC GPS WITH A KINEMATIC TIDE DATUM MODEL (SPC-FL-WEST-11AUG2010.KTD). NAVD88/MMLW SEPARATION = 1.57'.
 5. PLANE COORDINATES ARE BASED ON THE TRANSVERSE MERCATOR PROJECTION FOR THE WEST ZONE OF FLORIDA AND REFERENCED TO NORTH AMERICAN DATUM OF 1983 (NAD83).
 6. ALL AZIMUTHS ARE GRID; RECKONED CLOCKWISE FROM SOUTH.
 7. ALL STATIONING REFERS TO THE CENTERLINE OF THE CHANNEL.
 8. SURVEY WAS PERFORMED USING REAL-TIME KINEMATIC GPS POSITIONING WITH THE FOLLOWING REFERENCE BASE LOCATIONS:

"REFERENCE BASE LOCATED AT "GIS 106"

LAT: 27°26'52.53288" N
LON: 082°41'22.42673" W
ELLIPSOID HEIGHT: -75.472'
NAVD88 ELEVATION: 4.15'

"TIDE STAFF ESTABLISHED FROM "6217 TIDAL 1"

LAT: 27°27'59" N
LON: 082°41'16" W
NAVD88 ELEVATION: 3.18'
MLLW ELEVATION: 4.75'

VERTICAL MEASUREMENTS WERE MADE USING A ROSS SMARTSOUNDER DUAL FREQUENCY 28/200KHZ SINGLE-BEAM TRANSDUCER. SOUNDINGS SHOWN ARE IN HIGH FREQUENCY (200KHZ).

VESSEL	DATE OF SURVEY	CUT
WB-34	18 NOV 2010	3
WB-34	23 NOV 2010	1
WB-34	29 NOV 2010	1 & 2

9. AIDS TO NAVIGATION WERE LOCATED DURING THIS SURVEY.
10. THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED ABOVE AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS AT THAT TIME. THIS CHART IS SOLELY FOR THE DISTRIBUTION OF AVAILABLE DEPTHS AT THE TIME OF THE SURVEY AND IS NOT TO BE USED FOR NAVIGATION.
11. SURVEY ACCURACY PERFORMANCE STANDARDS, QUALITY CONTROL, AND QUALITY ASSURANCE REQUIREMENTS WERE FOLLOWED DURING THIS SURVEY IN ACCORDANCE WITH USACE EM 1110-2-1003, HYDROGRAPHIC SURVEYING, 1 JAN 02.



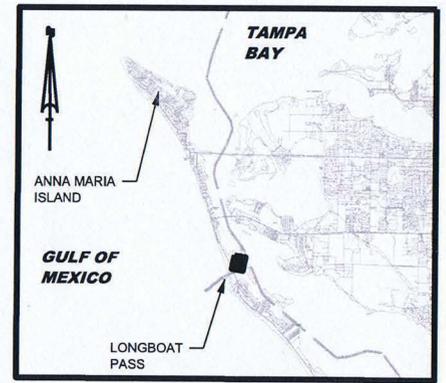
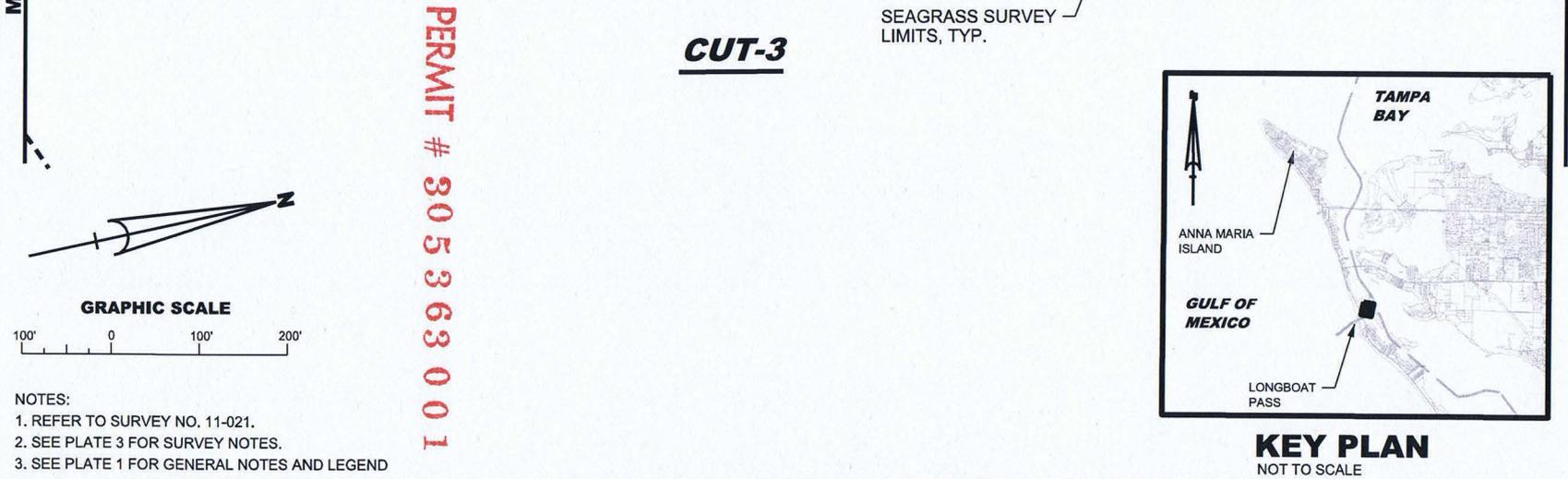
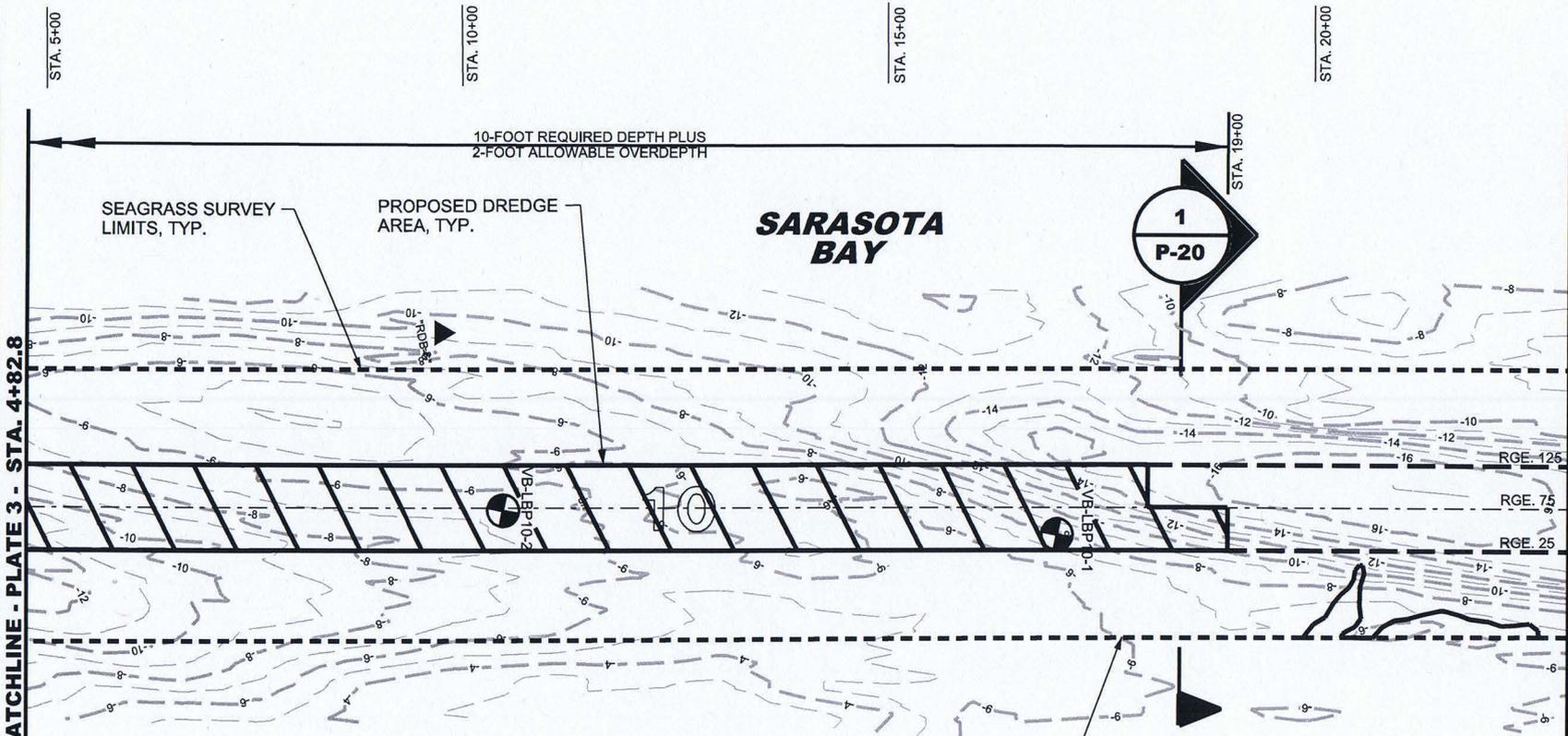
PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FILE NAME: GIWW/FY11-C-PL-04.DGN
DATE: MARCH 2011
SCALE: AS SHOWN

DWN BY: J.D.B.
DSN BY: J.D.B.
CND BY: J.T.M.

GIWW CR - AR (CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3)
PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL
MAINTENANCE DREDGING FY11
9-FOOT PROJECT
LONGBOAT CUT-3
STA. 4+82.8 - 23+00

PLATE:
4
OF 22



KEY PLAN
NOT TO SCALE

MATCHLINE - PLATE 3 - STA. 4+82.8

MATCHLINE - PLATE 5 - STA. 23+00



US Army Corps of Engineers
Jacksonville District

PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FILE NAME: GIWW/FY11-C-PL-05.DGN
DATES: MARCH 2011
SCALE: AS SHOWN

DWN BY: J.D.B.
DSN BY: J.D.B.
CND BY: J.T.M.

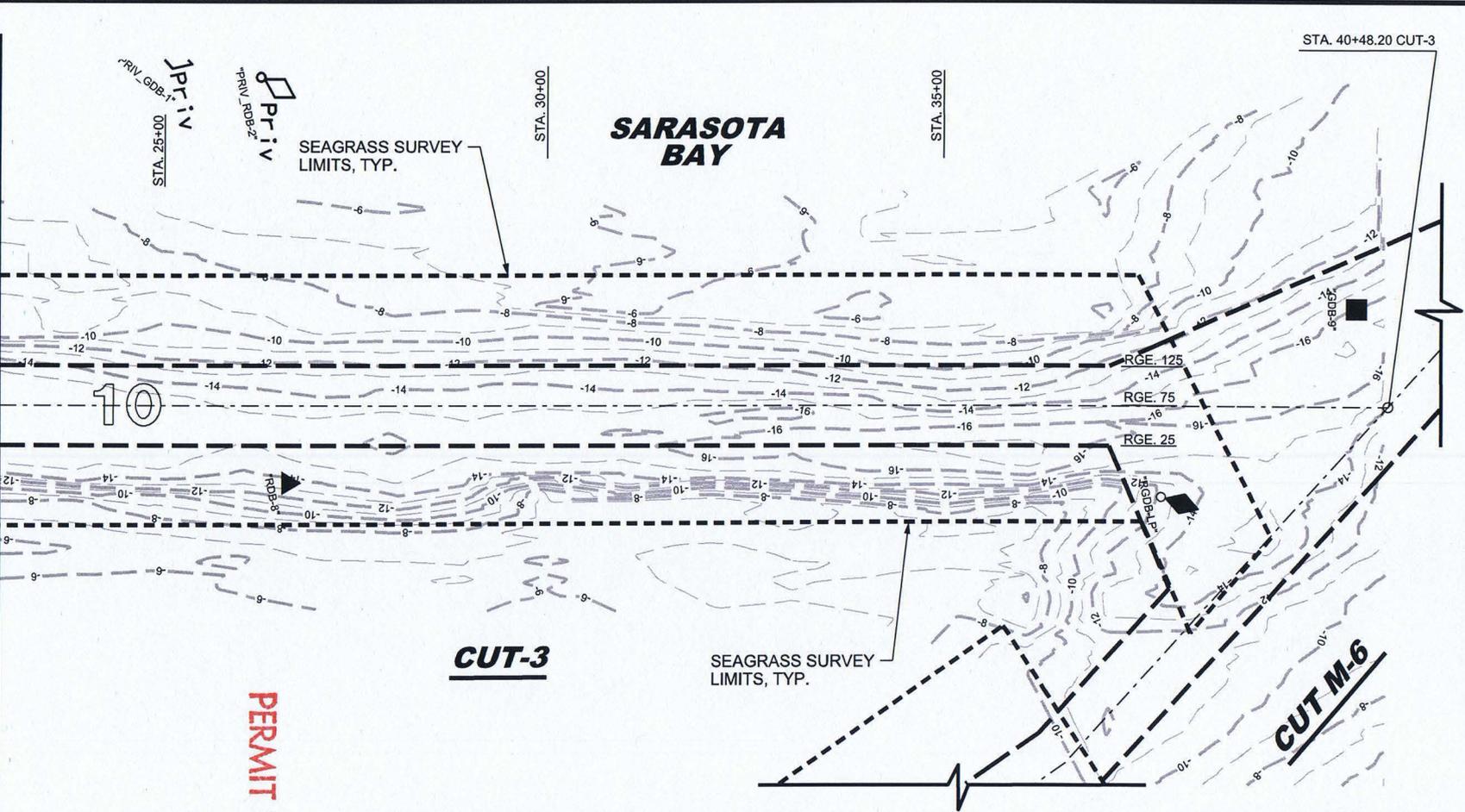
GIWW/CR - AR CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3)
PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL

MAINTENANCE DREDGING FY11
9-FOOT PROJECT
LONGBOAT CUT-3
STA. 23+00 - STA. 40+48.20

PLATE:
5

OF 22

MATCHLINE - PLATE 4 - STA. 23+00

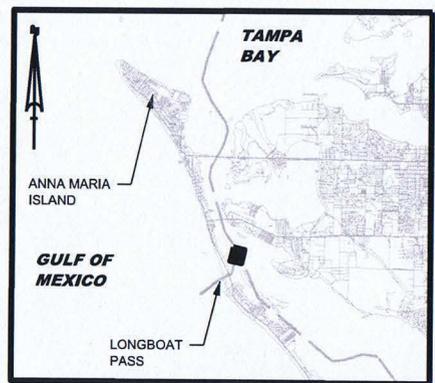


*** NO DREDGING ON THIS PLATE**

PERMIT # 30 E 3 6 3 0 0 1

GRAPHIC SCALE
100' 0 100' 200'

- NOTES:
1. REFER TO SURVEY NO. 11-021.
 2. SEE PLATE 3 FOR SURVEY NOTES.
 3. SEE PLATE 1 FOR GENERAL NOTES AND LEGEND



KEY PLAN
NOT TO SCALE

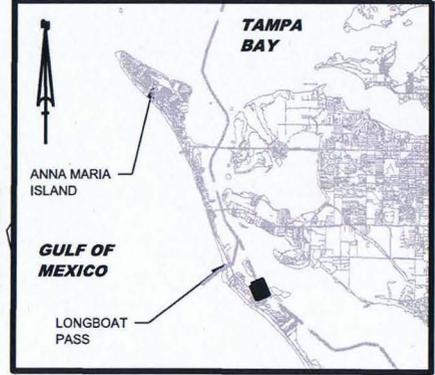
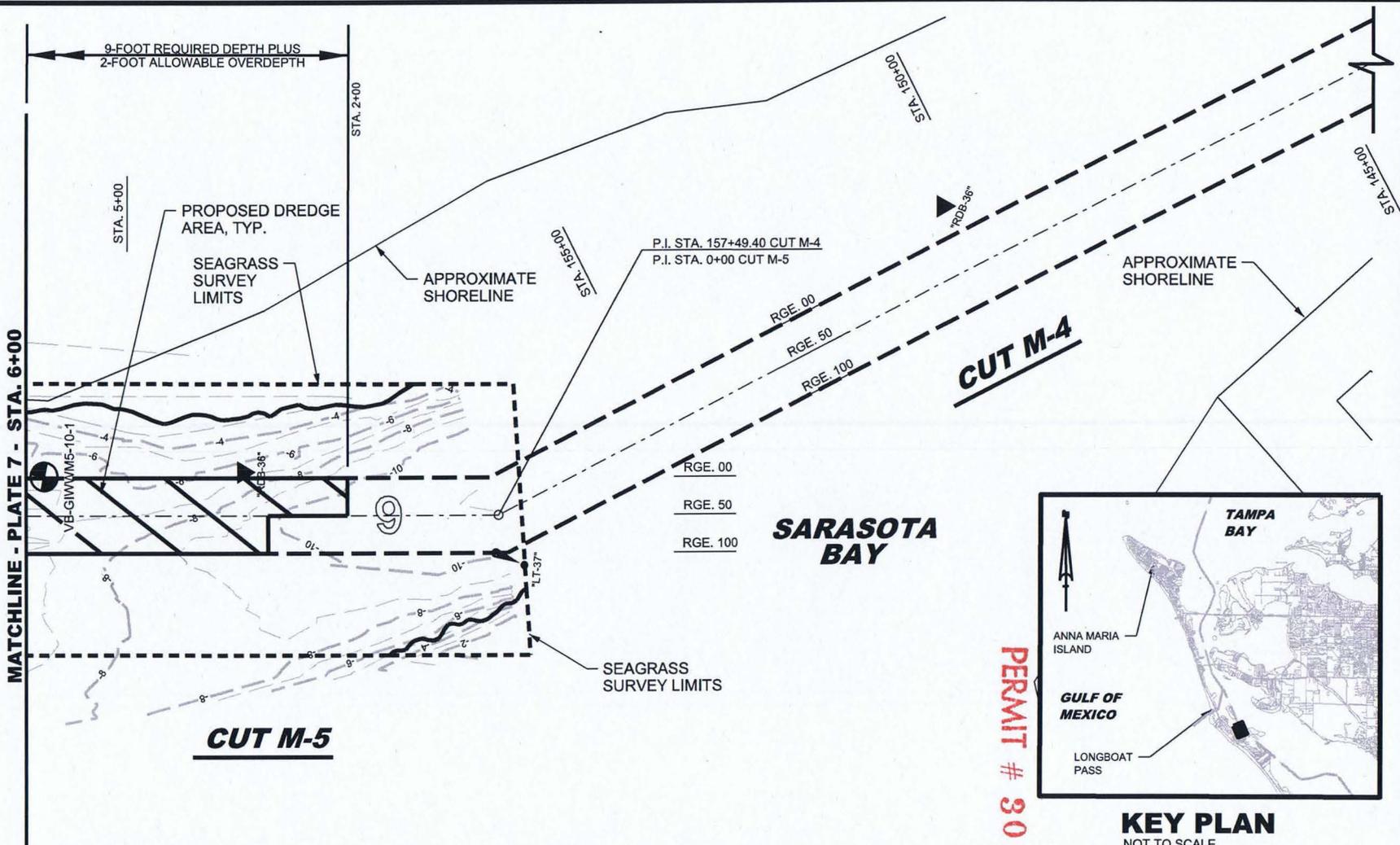
PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FILE NAME: GIMWCFY11-C-PL-06.DGN
DATE: MARCH 2011
SCALE: AS SHOWN

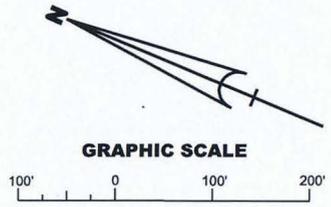
DWN BY: J.D.B.
DSN BY: J.D.B.
CUD BY: J.T.M.

GIMW OR - AR CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3)
PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL
MAINTENANCE DREDGING FY11
9-FOOT PROJECT
CUT M-5
STA. 0+00 - STA. 6+00

PLATE:
6
OF 22



PERMIT # 305363001



SURVEY NOTES:

- REFER TO SURVEY NO. 08-130.
- SOUNDINGS ARE IN FEET AND TENTHS AND REFER TO MEAN LOWER LOW WATER (MLLW) WHICH IS 1.57 FEET BELOW NAVD 1988.
- ALL ELEVATIONS ARE BELOW THE CHART DATUM UNLESS PRECEDED BY A (+) SIGN.
- TIDAL REDUCTIONS WERE MADE FROM A STAFF SET ON A DOCK PILING IN THE VICINITY OF, AND REFERENCED FROM BENCHMARK "NGS NO.1 1953".
- PLANE COORDINATES ARE BASED ON THE TRANSVERSE MERCATOR PROJECTION FOR THE WEST ZONE OF FLORIDA AND REFERENCED TO NORTH AMERICAN DATUM OF 1983 (NAD83).
- ALL AZIMUTHS ARE GRID; RECKONED CLOCKWISE FROM SOUTH.
- ALL STATIONING REFERS TO THE CENTERLINE OF THE CHANNEL.

8. SURVEY WAS PERFORMED USING DIFFERENTIAL GPS FOR POSITIONING AND UTILIZING THE USCG NAVBEACON SYSTEM AS THE REFERENCE SITE. VERTICAL MEASUREMENTS WERE MADE USING A ROSS SMART SOUNDER DEPTH RECORDER WITH A 200KHZ (HIGH FREQUENCY) TRANSDUCER.

VESSEL	DATE OF SURVEY	CUT
GANNETT II	20-21 MAY 2008	M-4 THRU M-7

- AIDS TO NAVIGATION WERE LOCATED DURING THIS SURVEY.
- THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED ABOVE AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS AT THAT TIME. THIS CHART IS SOLELY FOR THE DISTRIBUTION OF AVAILABLE DEPTHS AT THE TIME OF THE SURVEY AND IS NOT TO BE USED FOR NAVIGATION.
- SURVEY ACCURACY PERFORMANCE STANDARDS, QUALITY CONTROL, AND QUALITY ASSURANCE REQUIREMENTS WERE FOLLOWED DURING THIS SURVEY IN ACCORDANCE WITH USACE EM 1110-2-1003, HYDROGRAPHIC SURVEYS, 01 APR 04.

- NOTES:**
- REFER TO SURVEY NO. 08-130.
 - SEE THIS PLATE FOR SURVEY NOTES.
 - SEE PLATE 1 FOR GENERAL NOTES AND LEGEND

US Army Corps
of Engineers
Jacksonville District



PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FILE NAME:
GIWWFY11-C-PL-07.DGN

DATED:
MARCH 2011

SCALE:
AS SHOWN

DWN BY:
J.D.B.

DSN BY:
J.D.B.

CAD BY:
J.T.M.

GIWW CR - AR CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3)
PINELAS, HILLSBOROUGH AND MANATEE COUNTY, FL

MAINTENANCE DREDGING FY11

9-FOOT PROJECT

CUT M-5

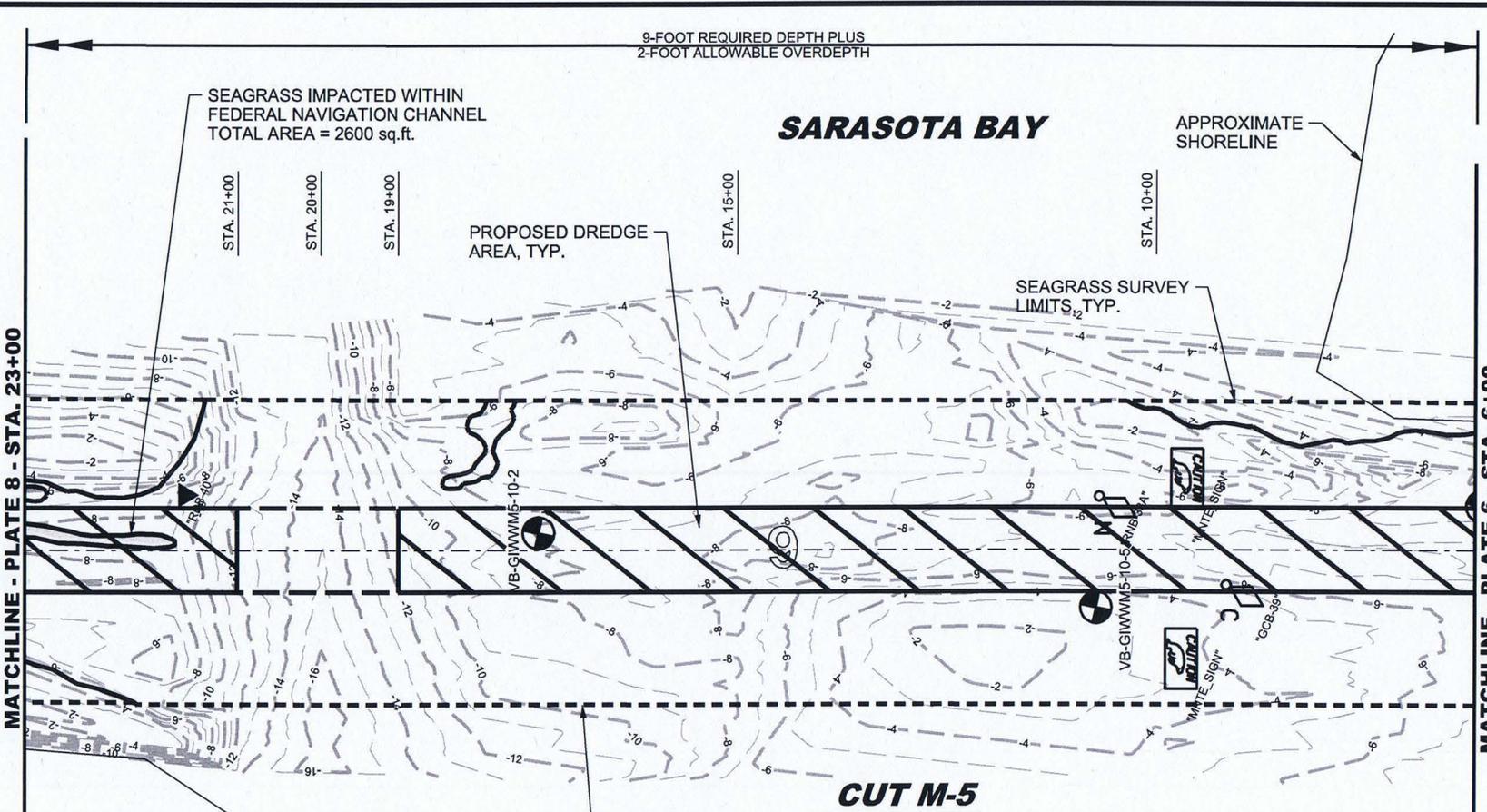
STA. 6+00 - STA. 23+00

PLATE:

7

OF 22

MATCHLINE - PLATE 8 - STA. 23+00

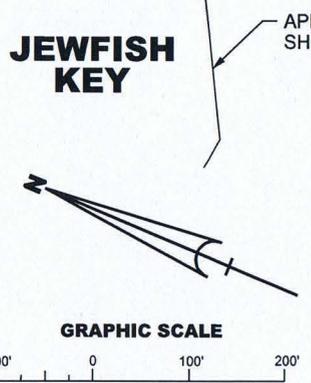


MATCHLINE - PLATE 6 - STA. 6+00

RGE. 00

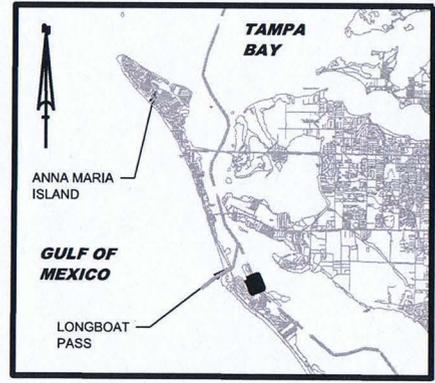
RGE. 50

RGE. 100



- NOTES:
1. REFER TO SURVEY NO. 08-130.
 2. SEE PLATE 6 FOR SURVEY NOTES.
 3. SEE PLATE 1 FOR GENERAL NOTES AND LEGEND

PERMIT # 30 5 3 6 3 0 0 1



KEY PLAN
NOT TO SCALE

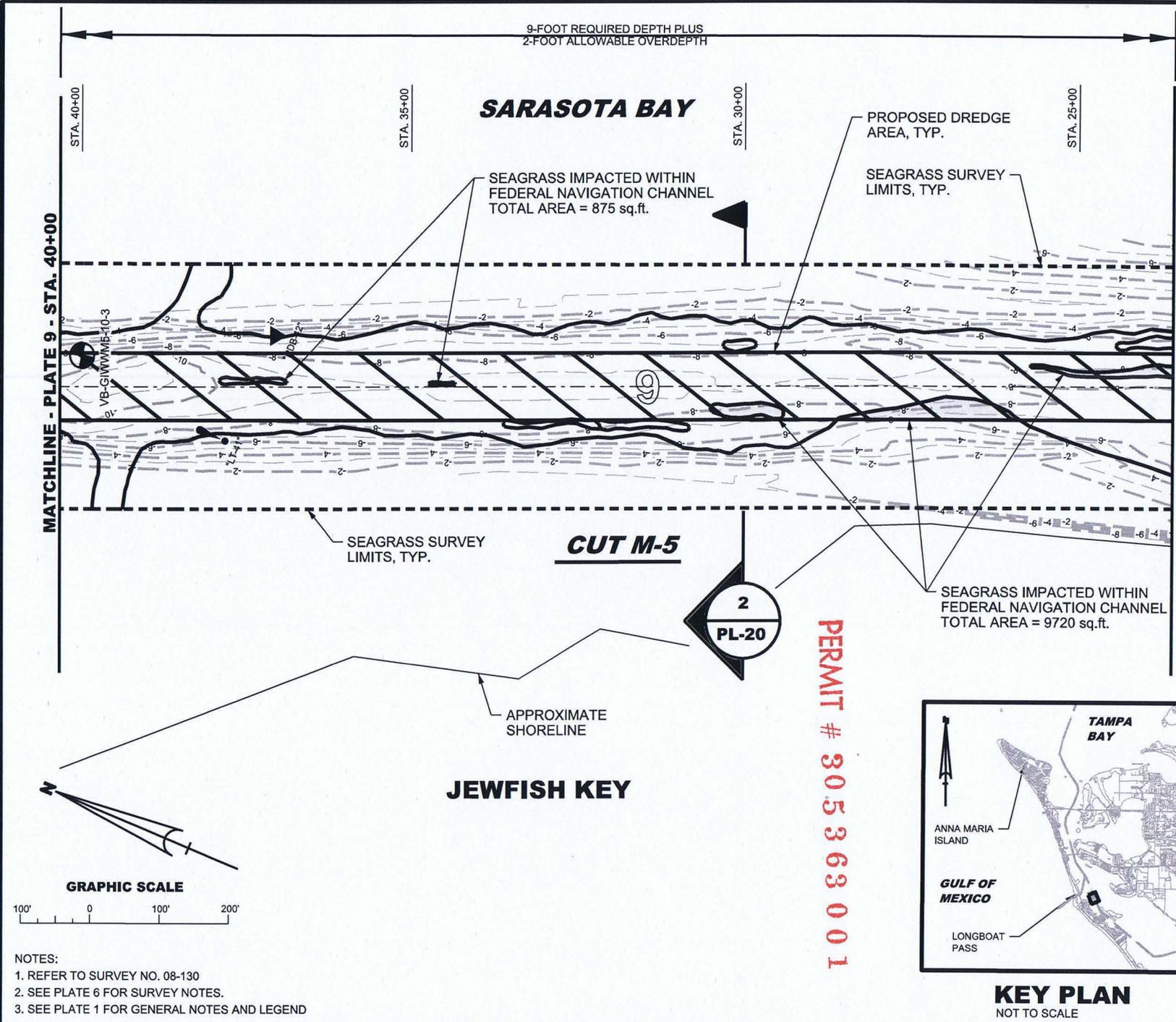


US Army Corps of Engineers
 Jacksonville District
PERMIT DRAWINGS
 (NOT FOR CONSTRUCTION)
 DEPARTMENT OF THE ARMY
 JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
 JACKSONVILLE, FLORIDA

FILE NAME: GIWWMFY11-C-PL-08 DGN
 DATE: MARCH 2011
 SCALE: AS SHOWN
 DWN BY: J.D.B.
 DSN BY: J.D.B.
 CND BY: J.T.M.

GIWWM GR - AR (CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3)
 PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL
MAINTENANCE DREDGING FY11
9-FOOT PROJECT
CUT M-5
 STA. 23+00 - STA. 40+00

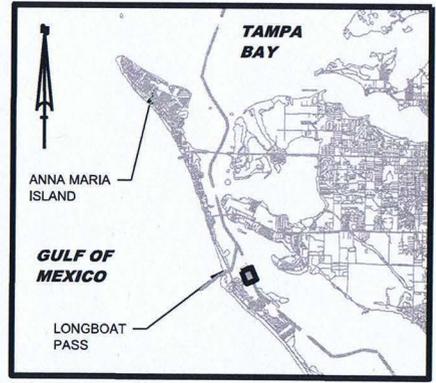
PLATE:
8
 OF 22



MATCHLINE - PLATE 7 - STA. 23+00

RGE. 00
 RGE. 50
 RGE. 100

PERMIT # 30.5363001



KEY PLAN
 NOT TO SCALE

- NOTES:
 1. REFER TO SURVEY NO. 08-130
 2. SEE PLATE 6 FOR SURVEY NOTES.
 3. SEE PLATE 1 FOR GENERAL NOTES AND LEGEND

PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FILE NAME: GIWWFY11-C-PL-09 DGN
DATED: MARCH 2011
SCALE: AS SHOWN

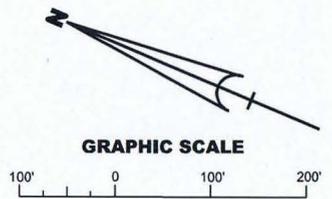
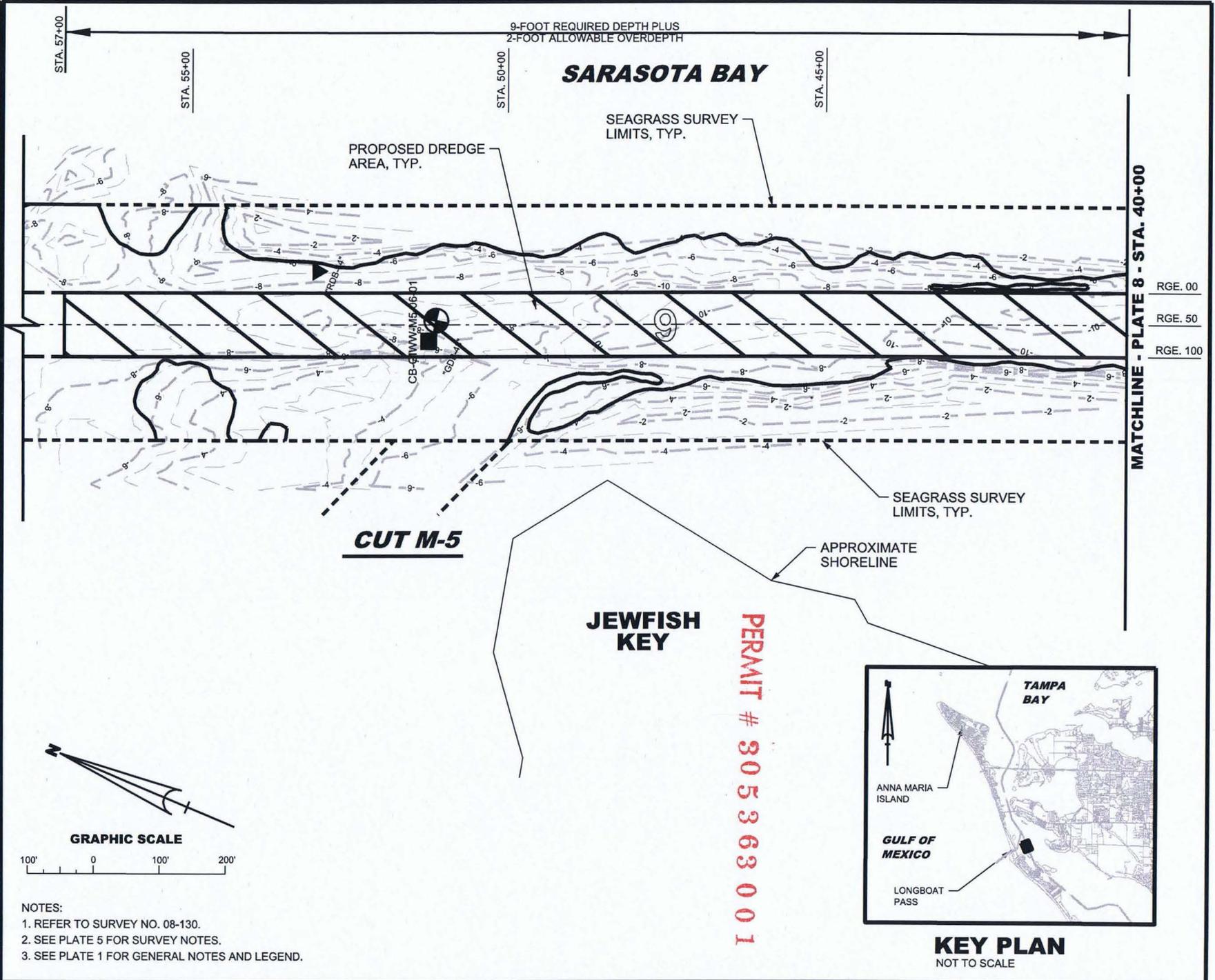
DWN BY: J.D.B.
DGN BY: J.D.B.
CRD BY: J.T.M.

GIWW OR - AR CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3)
PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL

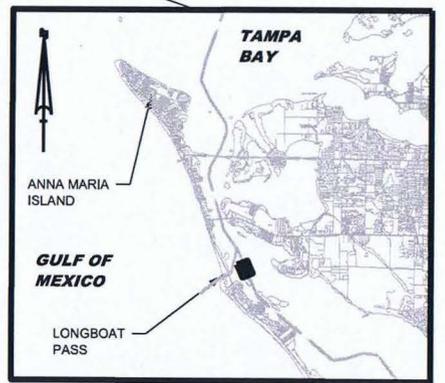
MAINTENANCE DREDGING FY11
9-FOOT PROJECT
CUT M-5
STA. 40+00 - STA. 58+00

PLATE:
9

OF 22



- NOTES:
1. REFER TO SURVEY NO. 08-130.
 2. SEE PLATE 5 FOR SURVEY NOTES.
 3. SEE PLATE 1 FOR GENERAL NOTES AND LEGEND.



KEY PLAN
NOT TO SCALE

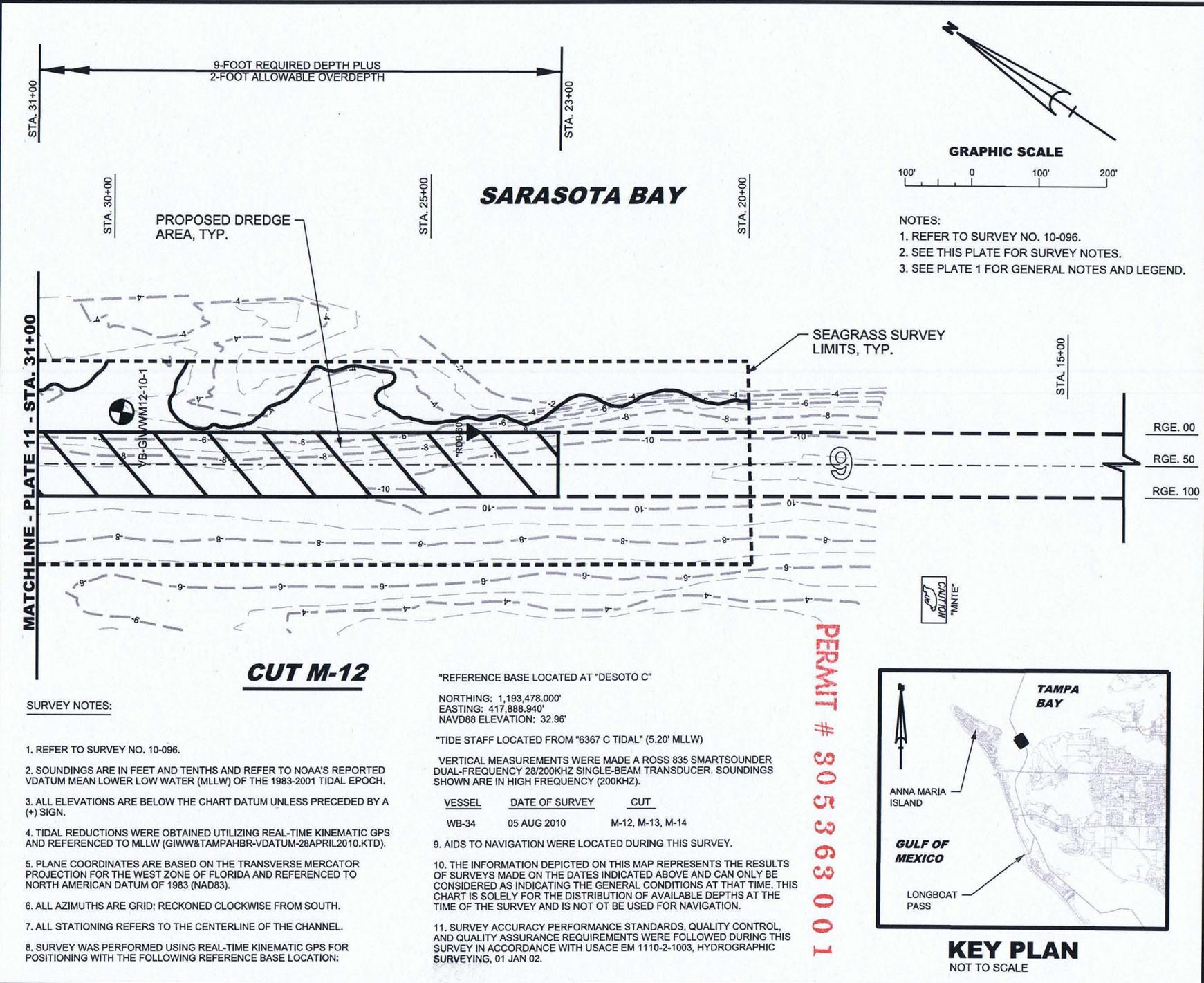
PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FILE NAME: GIWWWY11-C-PL-10.DGN
DATE: MARCH 2011
SCALE: AS SHOWN

DWN BY: J.D.B.
DSN BY: J.D.B.
CND BY: J.T.M.

GIWWW CR-AR (CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3) PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL
9-FOOT PROJECT MAINTENANCE DREDGING FY11
CUT M-12
STA. 14+00 - STA. 31+00

PLATE: **10**
OF 22



9-FOOT REQUIRED DEPTH PLUS
2-FOOT ALLOWABLE OVERDEPTH

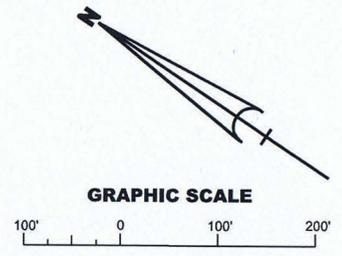
STA. 31+00

STA. 23+00

STA. 30+00

PROPOSED DREDGE AREA, TYP.

SARASOTA BAY



- NOTES:
1. REFER TO SURVEY NO. 10-096.
 2. SEE THIS PLATE FOR SURVEY NOTES.
 3. SEE PLATE 1 FOR GENERAL NOTES AND LEGEND.

MATCHLINE - PLATE 11 - STA. 31+00

SEAGRASS SURVEY LIMITS, TYP.

STA. 15+00

RGE. 00
RGE. 50
RGE. 100

CUT M-12

SURVEY NOTES:

1. REFER TO SURVEY NO. 10-096.
2. SOUNDINGS ARE IN FEET AND TENTHS AND REFER TO NOAA'S REPORTED VDATUM MEAN LOWER LOW WATER (MLLW) OF THE 1983-2001 TIDAL EPOCH.
3. ALL ELEVATIONS ARE BELOW THE CHART DATUM UNLESS PRECEDED BY A (+) SIGN.
4. TIDAL REDUCTIONS WERE OBTAINED UTILIZING REAL-TIME KINEMATIC GPS AND REFERENCED TO MLLW (GIWWW&TAMPAHBR-VDATUM-28APRIL2010.KTD).
5. PLANE COORDINATES ARE BASED ON THE TRANSVERSE MERCATOR PROJECTION FOR THE WEST ZONE OF FLORIDA AND REFERENCED TO NORTH AMERICAN DATUM OF 1983 (NAD83).
6. ALL AZIMUTHS ARE GRID; RECKONED CLOCKWISE FROM SOUTH.
7. ALL STATIONING REFERS TO THE CENTERLINE OF THE CHANNEL.
8. SURVEY WAS PERFORMED USING REAL-TIME KINEMATIC GPS FOR POSITIONING WITH THE FOLLOWING REFERENCE BASE LOCATION:

"REFERENCE BASE LOCATED AT "DESCOTO C"

NORTHING: 1,193,478.000'
EASTING: 417,888.940'
NAVD88 ELEVATION: 32.96'

"TIDE STAFF LOCATED FROM "6367 C TIDAL" (5.20' MLLW)

VERTICAL MEASUREMENTS WERE MADE A ROSS 835 SMARTSOUNDER DUAL-FREQUENCY 28/200KHZ SINGLE-BEAM TRANSDUCER. SOUNDINGS SHOWN ARE IN HIGH FREQUENCY (200KHZ).

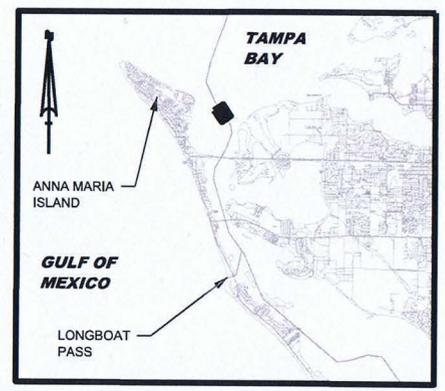
VESSEL	DATE OF SURVEY	CUT
WB-34	05 AUG 2010	M-12, M-13, M-14

9. AIDS TO NAVIGATION WERE LOCATED DURING THIS SURVEY.

10. THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED ABOVE AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS AT THAT TIME. THIS CHART IS SOLELY FOR THE DISTRIBUTION OF AVAILABLE DEPTHS AT THE TIME OF THE SURVEY AND IS NOT TO BE USED FOR NAVIGATION.

11. SURVEY ACCURACY PERFORMANCE STANDARDS, QUALITY CONTROL, AND QUALITY ASSURANCE REQUIREMENTS WERE FOLLOWED DURING THIS SURVEY IN ACCORDANCE WITH USACE EM 1110-2-1003, HYDROGRAPHIC SURVEYING, 01 JAN 02.

PERMIT # 305363001



KEY PLAN
NOT TO SCALE



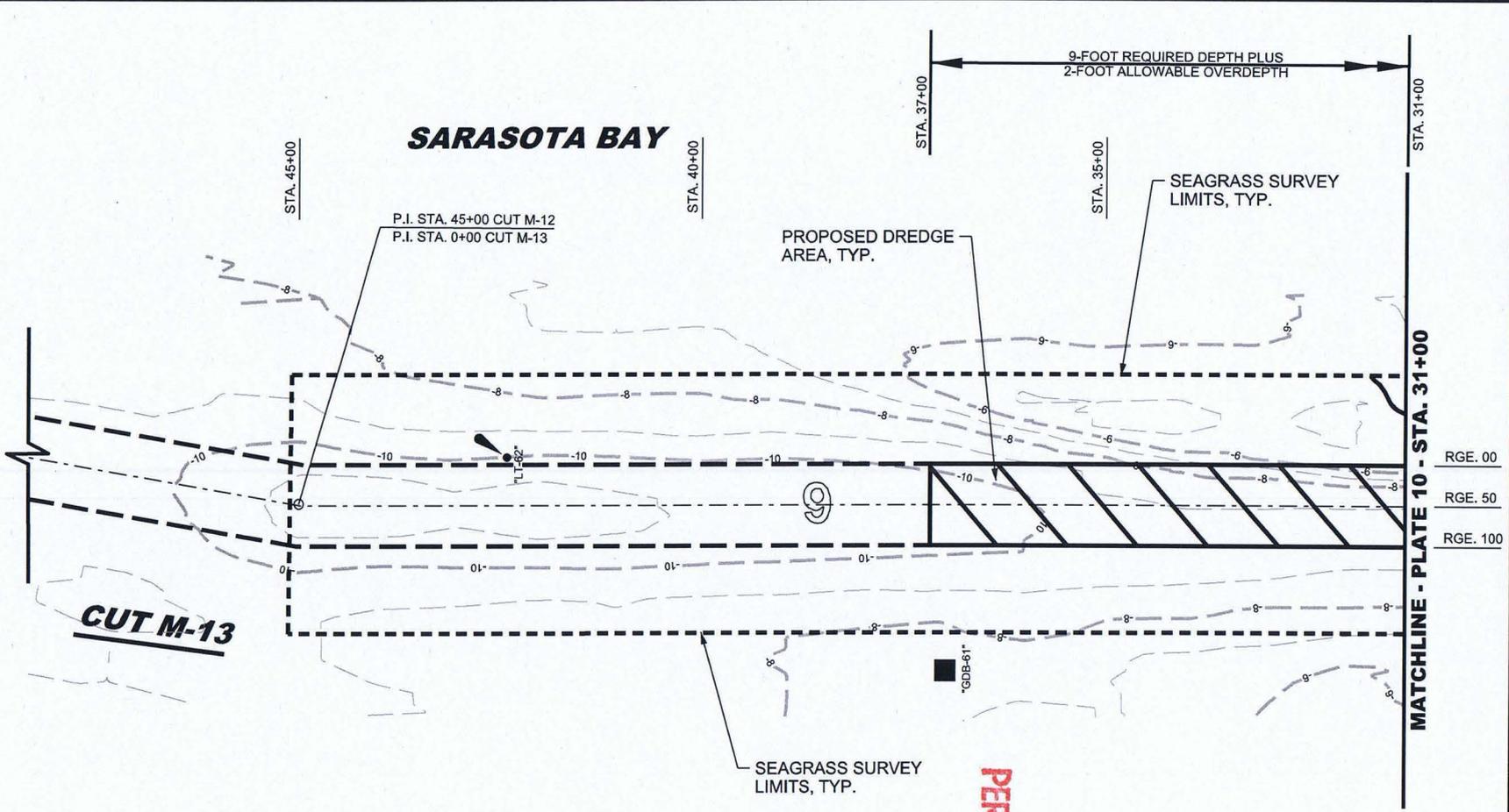
PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FILE NAME: GIMWFY11-C-PL-11.DGN
DATED: MARCH 2011
SCALE: AS SHOWN

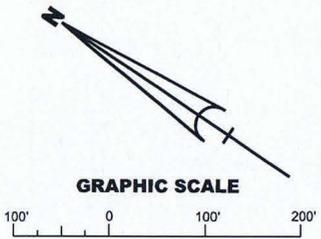
OWN BY: J.D.B.
DSN BY: J.D.B.
CKD BY: J.T.M.

GIMWFY11-C-PL-11.DGN
PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL
MAINTENANCE DREDGING FY11
9-FOOT PROJECT
CUT M-12
STA. 31+00 - STA. 45+00

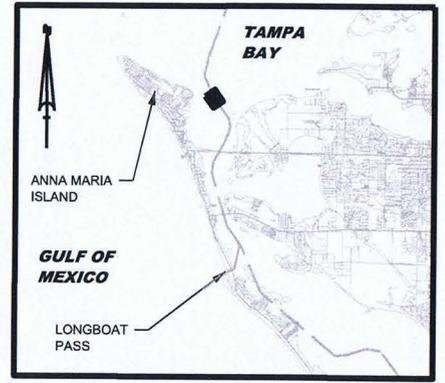
PLATE:
11
OF 22



PERMIT # 305363001



- NOTES:
1. REFER TO SURVEY NO. 10-096.
 2. SEE PLATE 10 FOR SURVEY NOTES.
 3. SEE PLATE 1 FOR GENERAL NOTES AND LEGEND.



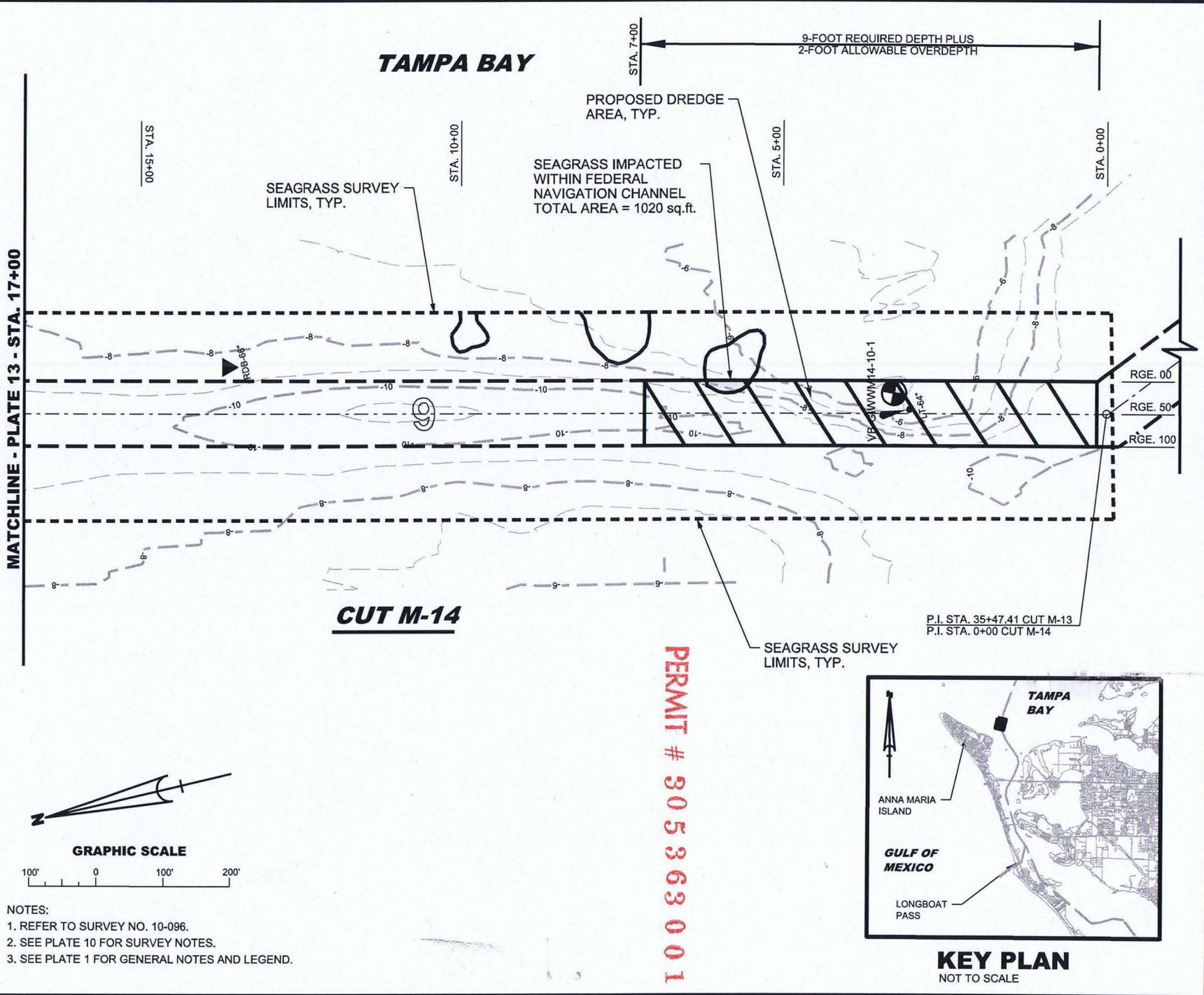
PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FILE NAME: G1WV/FY11-C-PL-12.DGN
DATE: MARCH 2011
SCALE: AS SHOWN

DWN BY: J.D.B.
DSN BY: J.D.B.
CHK BY: J.T.M.

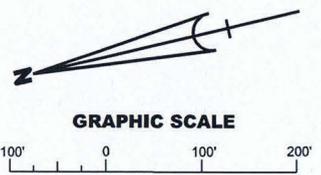
G1WV CR - AR (CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3) PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL
MAINTENANCE DREDGING FY11
9-FOOT PROJECT
CUT M-14
STA. 0+00 - STA. 17+00

PLATE:
12
OF 22

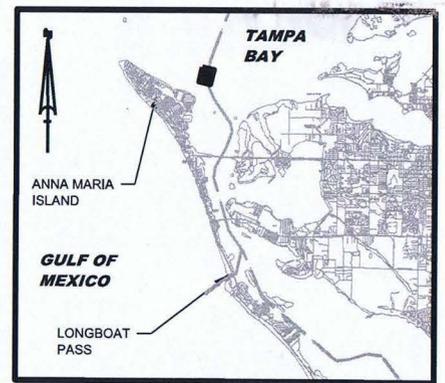


MATCHLINE - PLATE 13 - STA. 17+00

- NOTES:
1. REFER TO SURVEY NO. 10-096.
2. SEE PLATE 10 FOR SURVEY NOTES.
3. SEE PLATE 1 FOR GENERAL NOTES AND LEGEND.



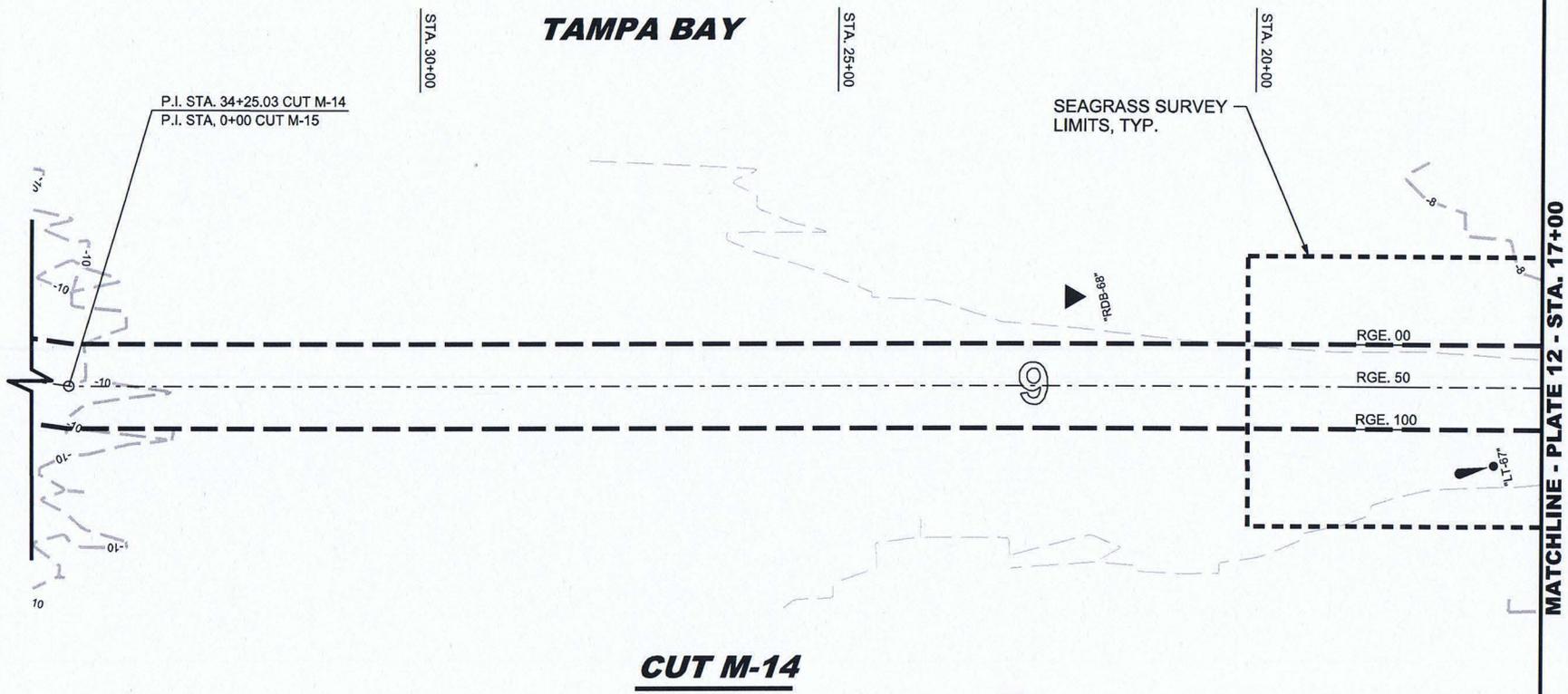
PERMIT # 305363001



KEY PLAN
NOT TO SCALE

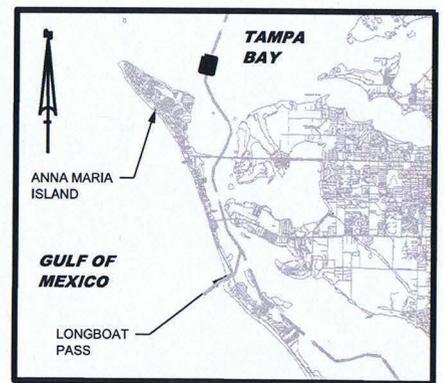
***NO DREDGING ON THIS PLATE**

TAMPA BAY

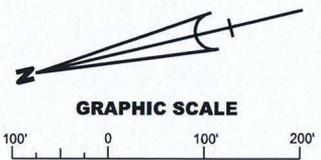


CUT M-14

PERMIT # 305363001



KEY PLAN
NOT TO SCALE



- NOTES:
1. REFER TO SURVEY NO. 10-096.
 2. SEE PLATE 10 FOR SURVEY NOTES.
 3. SEE PLATE 1 FOR GENERAL NOTES AND LEGEND

	PERMIT DRAWINGS (NOT FOR CONSTRUCTION)		FILE NAME: GIWWWFY11-C-PL-13.DGN	
	DEPARTMENT OF THE ARMY JACKSONVILLE DISTRICT, CORPS OF ENGINEERS JACKSONVILLE, FLORIDA		DATE: MARCH 2011	
SCALE: AS SHOWN		DSN BY: J.D.B.		GIWWW GR - AR (CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3) PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL MAINTENANCE DREDGING FY11 9-FOOT PROJECT CUT M-14 STA. 17+00 - STA. 34+25.03
J.T.M.		CRD BY: J.T.M.		
PLATE: 13		OF 22		



PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

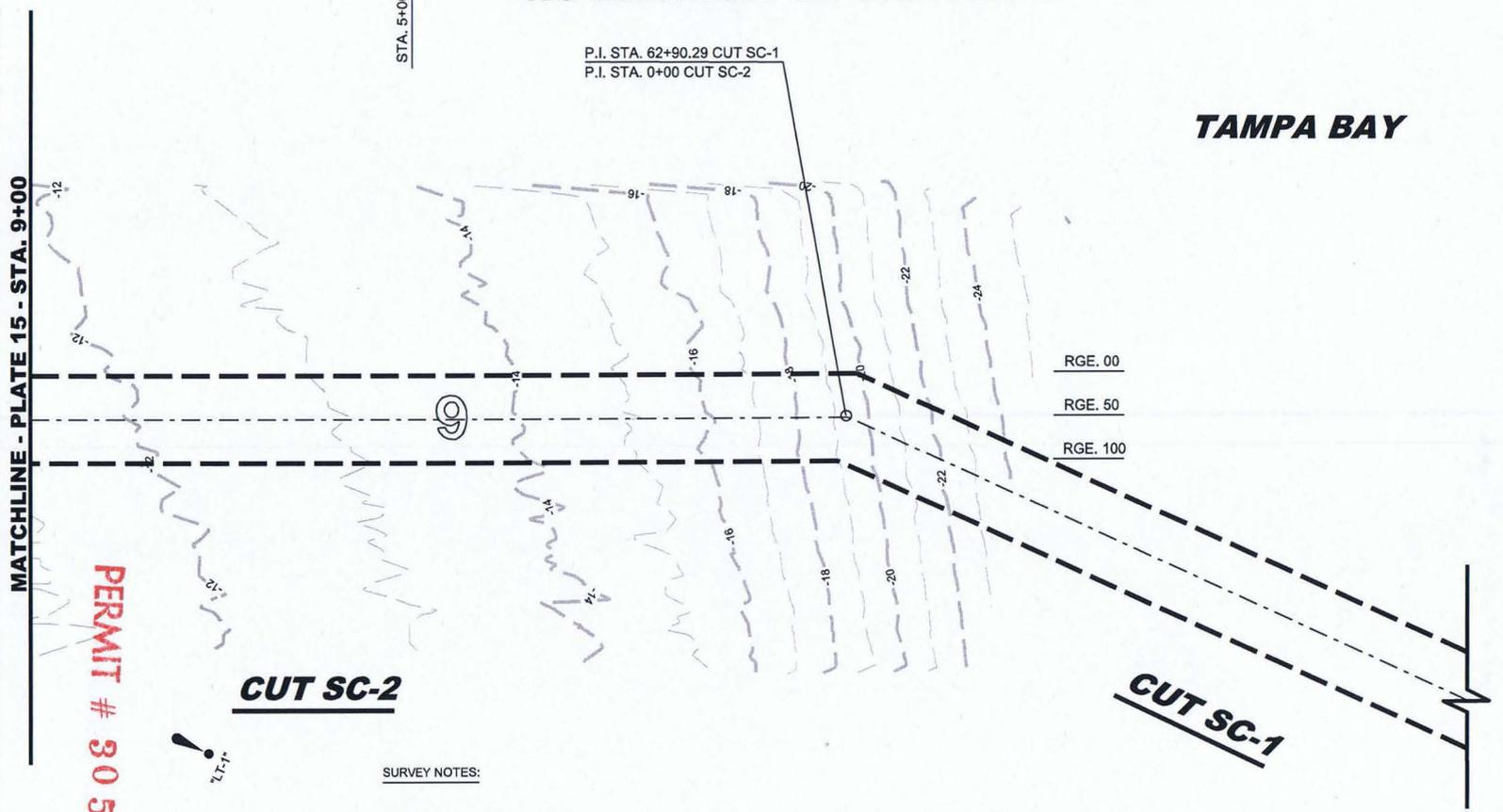
FILE NAME: GIWWWFY11-C-PL-14.DGN
DATED: MARCH 2011
SCALE: AS SHOWN

DWN BY: J.D.B.
DSN BY: J.D.B.
CND BY: J.T.M.

GIWW OR - AR (CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3)
PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL
MAINTENANCE DREDGING FY11
9-FOOT PROJECT
CUT SC-2
STA. 0+00 - STA. 9+00

PLATE:
14
OF 22

*** NO DREDGING ON THIS PLATE**



TAMPA BAY

MATCHLINE - PLATE 15 - STA. 9+00

PERMIT # 305363001

CUT SC-2

CUT SC-1

SURVEY NOTES:

1. REFER TO SURVEY NO. 10-097.
2. SOUNDINGS ARE IN FEET AND TENTHS AND REFER TO NOAA'S REPORTED VDATUM MEAN LOWER LOW WATER (MLLW) OF THE 1983-2001 TIDAL EPOCH.
3. ALL ELEVATIONS ARE BELOW THE CHART DATUM UNLESS PRECEDED BY A (+) SIGN.
4. TIDAL REDUCTIONS WERE OBTAINED UTILIZING REAL-TIME KINEMATIC GPS AND REFERENCED TO MLLW (GIWW&TAMPAHBR-VDATUM-28APRIL2010.KTD).
5. PLANE COORDINATES ARE BASED ON THE TRANSVERSE MERCATOR PROJECTION FOR THE WEST ZONE OF FLORIDA AND REFERENCED TO NORTH AMERICAN DATUM OF 1983 (NAD83).
6. ALL AZIMUTHS ARE GRID; RECKONED CLOCKWISE FROM SOUTH.
7. ALL STATIONING REFERS TO THE CENTERLINE OF THE CHANNEL.
8. SURVEY WAS PERFORMED USING REAL-TIME KINEMATIC GPS FOR POSITIONING WITH THE FOLLOWING REFERENCE BASE LOCATION:
"REFERENCE BASE LOCATED AT "DESOTO C"

NORTHING: 1,193,478.000'
EASTING: 417,888.940'
NAVD88 ELEVATION: 32.96'

*TIDE STAFF LOCATED FROM "N-17" (17.13' MLLW)

VERTICAL MEASUREMENTS WERE MADE A ROSS 835 SMARTSOUNDER DUAL-FREQUENCY 28/200KHZ SINGLE-BEAM TRANSDUCER. SOUNDINGS SHOWN ARE IN HIGH FREQUENCY (200KHZ).

VESSEL	DATE OF SURVEY	CUT
WB-34	02 AUG 2010	SC-2, SC-3

9. AIDS TO NAVIGATION WERE LOCATED DURING THIS SURVEY.

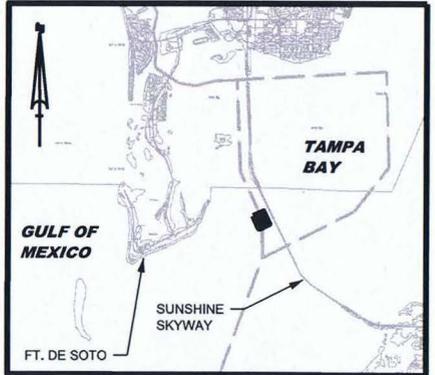
10. THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED ABOVE AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS AT THAT TIME. THIS CHART IS SOLELY FOR THE DISTRIBUTION OF AVAILABLE DEPTHS AT THE TIME OF THE SURVEY AND IS NOT OT BE USED FOR NAVIGATION.

11. SURVEY ACCURACY PERFORMANCE STANDARDS, QUALITY CONTROL, AND QUALITY ASSURANCE REQUIREMENTS WERE FOLLOWED DURING THIS SURVEY IN ACCORDANCE WITH USACE EM 1110-2-1003, HYDROGRAPHIC SURVEYING, 01 JAN 02.



NOTES:

1. REFER TO SURVEY NO. 10-097.
2. SEE THIS PLATE FOR SURVEY NOTES.
3. SEE PLATE 1 FOR GENERAL NOTES AND LEGEND



KEY PLAN
NOT TO SCALE



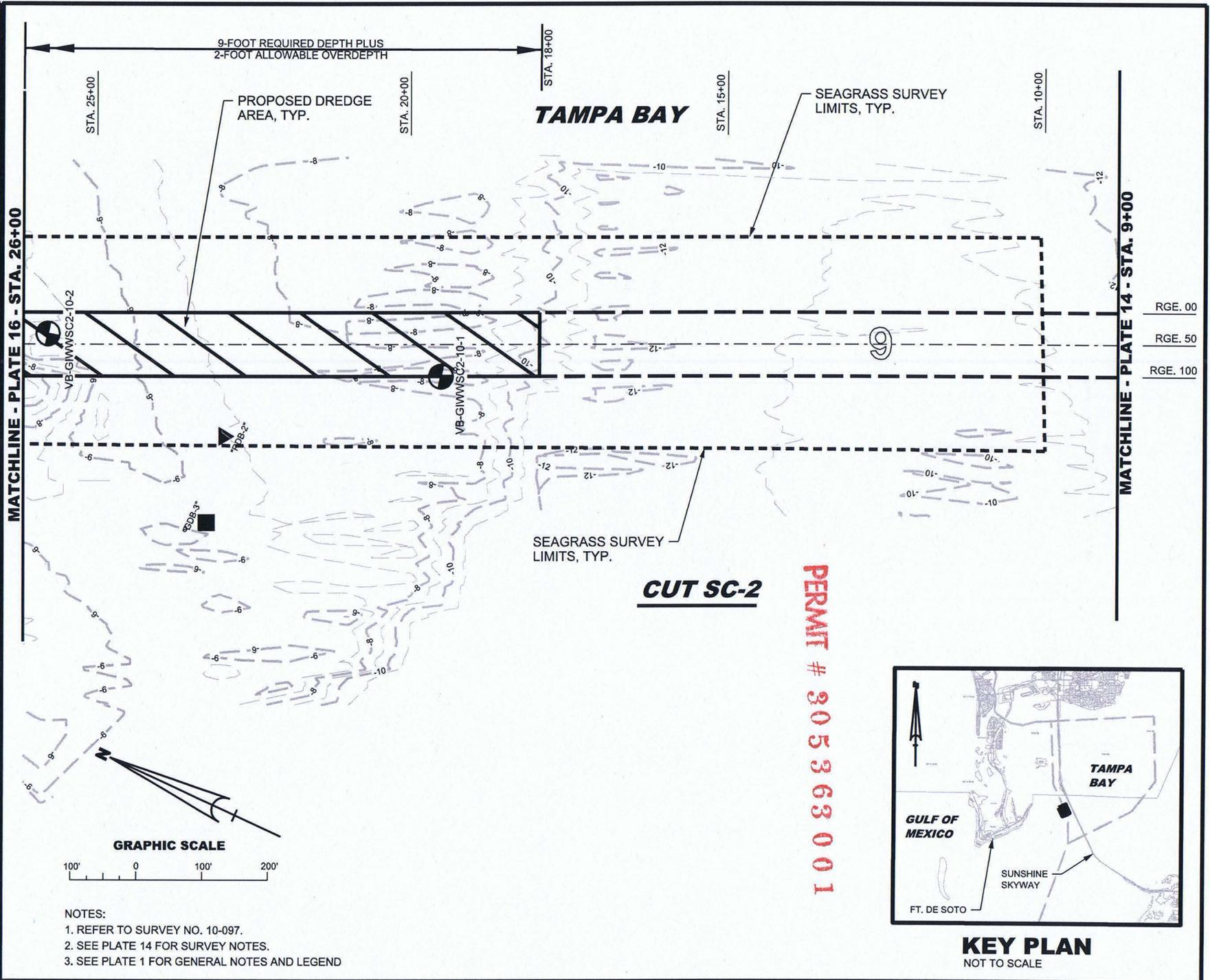
US Army Corps of Engineers Jacksonville District
 DEPARTMENT OF THE ARMY
 JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
 JACKSONVILLE, FLORIDA

PERMIT DRAWINGS
 (NOT FOR CONSTRUCTION)
 FILE NAME: GIWWFY11-C-PL-15.DGN
 DATED: MARCH 2011
 SCALE: AS SHOWN

DWN BY: J.D.B.
 DSN BY: J.D.B.
 CND BY: J.T.M.

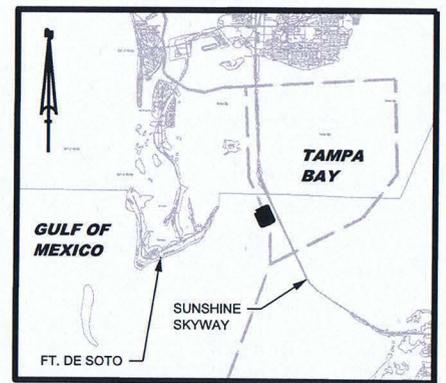
GIWW CR - AR (CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3)
 PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL
MAINTENANCE DREDGING FY11
9-FOOT PROJECT
CUT SC-2
 STA. 9+00 - STA. 26+00

PLATE:
15
 OF 22



RGE. 00
 RGE. 50
 RGE. 100

PERMIT # 305363001



KEY PLAN
 NOT TO SCALE

- NOTES:
1. REFER TO SURVEY NO. 10-097.
 2. SEE PLATE 14 FOR SURVEY NOTES.
 3. SEE PLATE 1 FOR GENERAL NOTES AND LEGEND



PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FILE NAME:
GIWWFY11-C-PL-13.DGN

DATE:
MARCH 2011

SCALE:
AS SHOWN

DWN BY:
J.D.B.

DSN BY:
J.D.B.

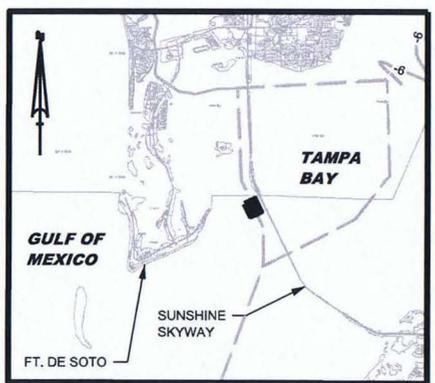
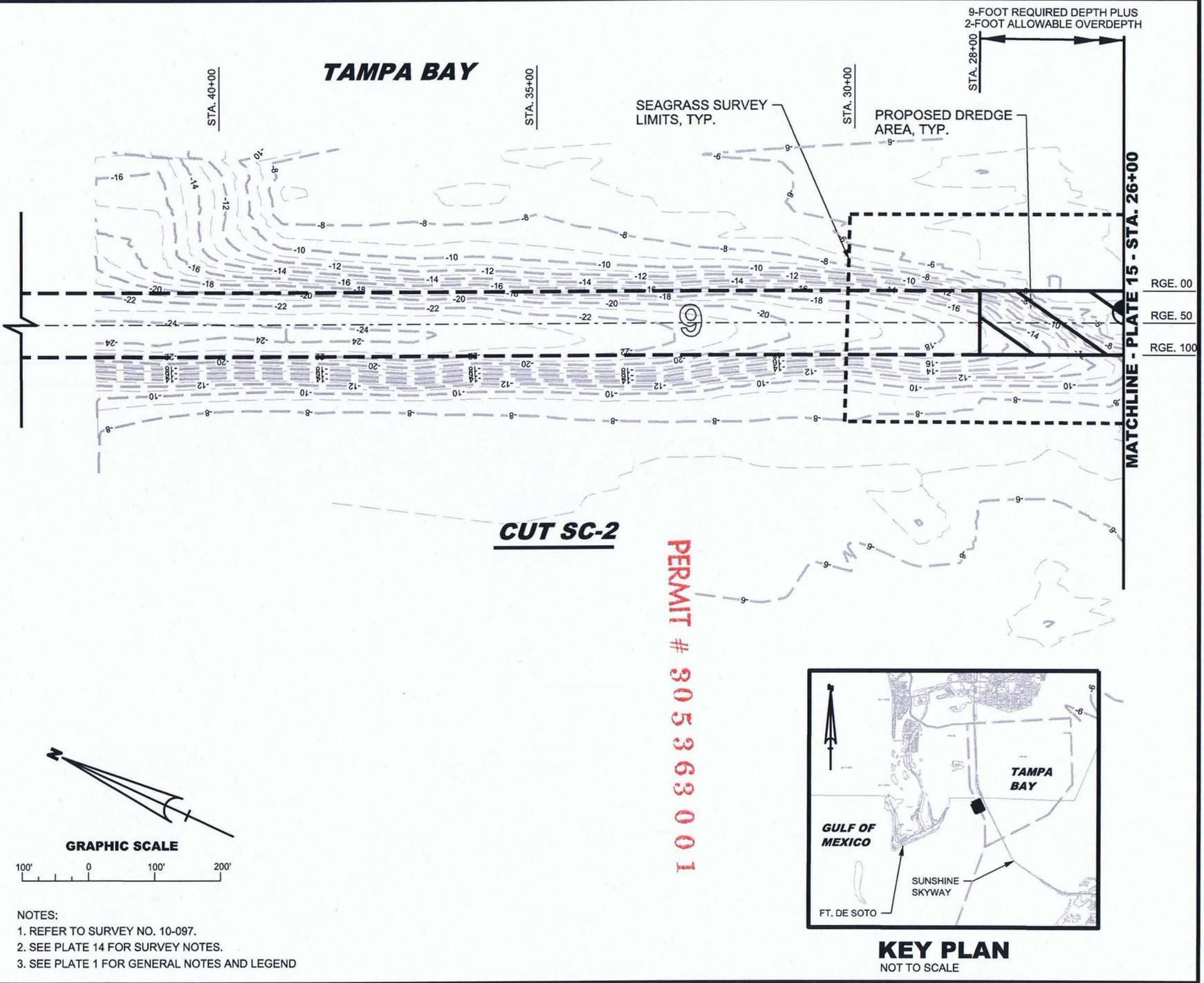
CAD BY:
J.T.M.

GIWW CR - AR (CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3)
PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL

MAINTENANCE DREDGING FY11
9-FOOT PROJECT
CUT SC-2
STA. 26+00 - STA. 43+00

PLATE:
16

OF 22



KEY PLAN
NOT TO SCALE

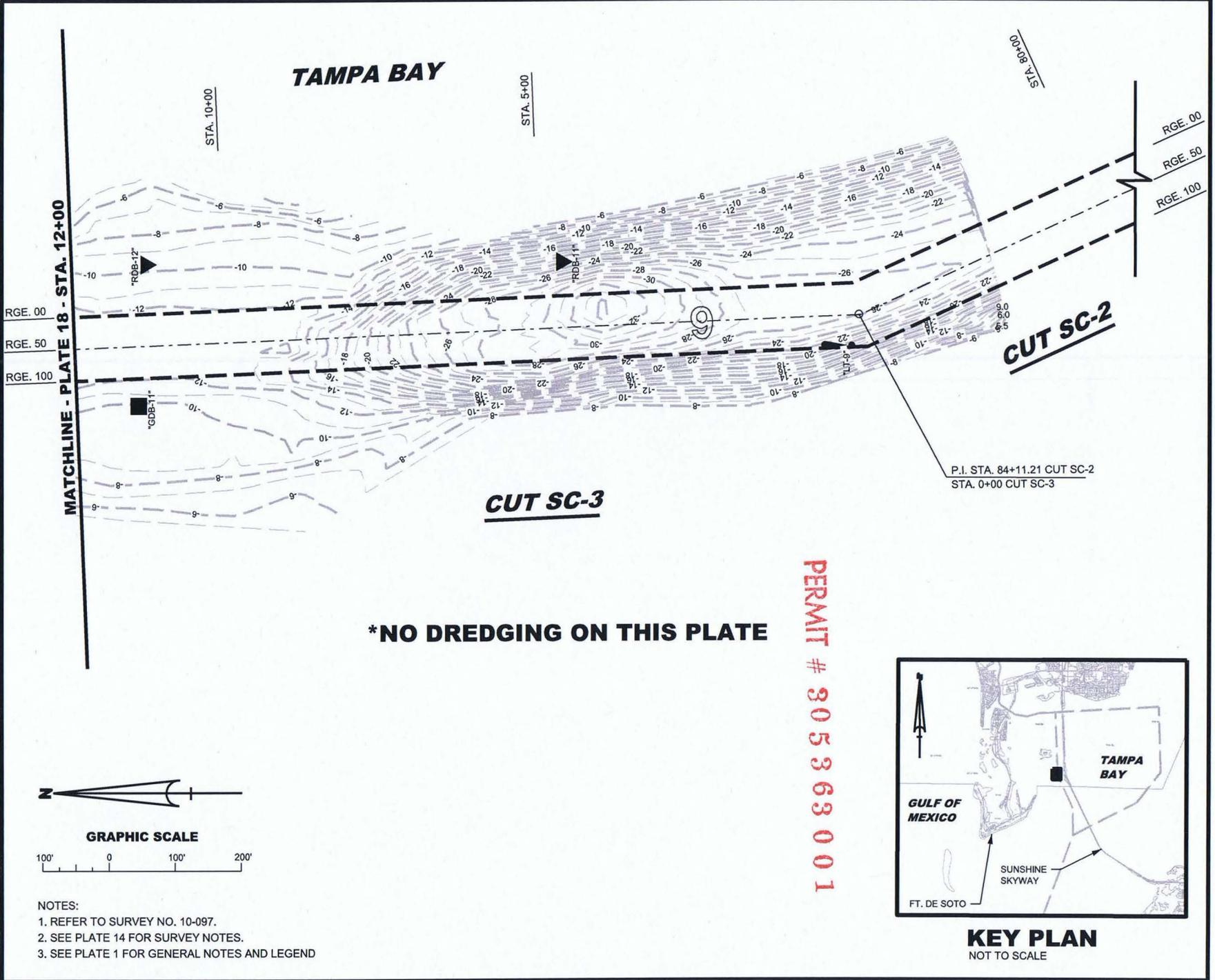
PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FILE NAME: GIWVWFY11-C-PL-17.DGN
DATE: MARCH 2011
SCALE: AS SHOWN

DWN BY: J.D.B.
DSN BY: J.D.B.
CND BY: J.T.M.

GIWV CR - AR CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3)
PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL
MAINTENANCE DREDGING FY11
9-FOOT PROJECT
CUT SC-3
STA. 0+00 - STA. 12+00

PLATE:
17
OF 22



US Army Corps
of Engineers
Jacksonville District

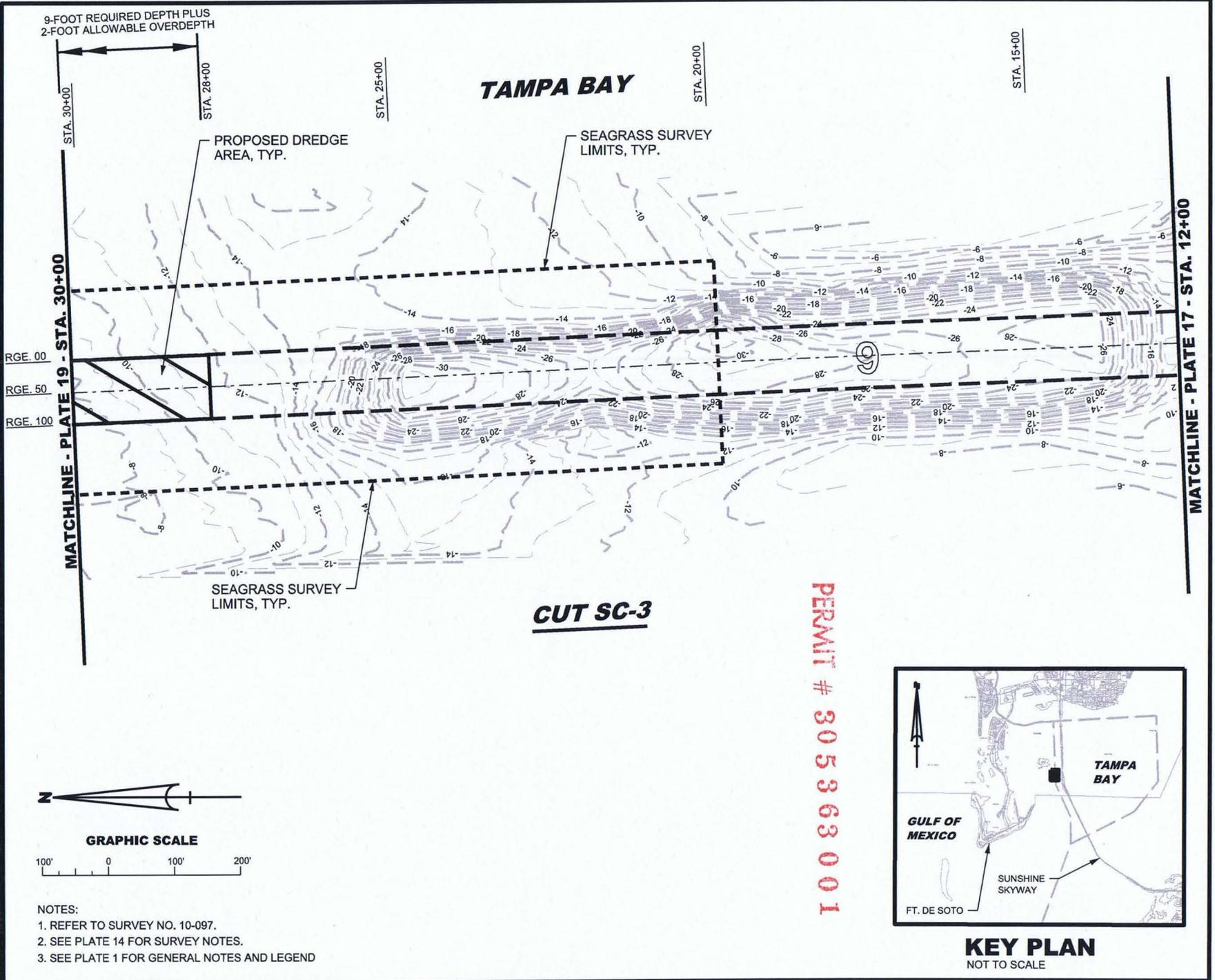


PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FILE NAME: GIMWWFY11-C-PL-18.DGN	DWN BY: J.D.B.
DATED: MARCH 2011	DSN BY: J.D.B.
SCALE: AS SHOWN	CMD BY: J.T.M.

GIMW CR - AR CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3)
PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL
MAINTENANCE DREDGING FY11
9-FOOT PROJECT
CUT SC-3
STA. 12+00 - STA. 30+00

PLATE:
18
OF 22

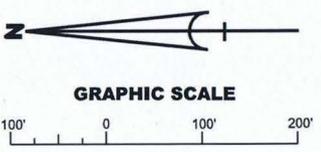


9-FOOT REQUIRED DEPTH PLUS
2-FOOT ALLOWABLE OVERDEPTH

RGE. 00
RGE. 50
RGE. 100

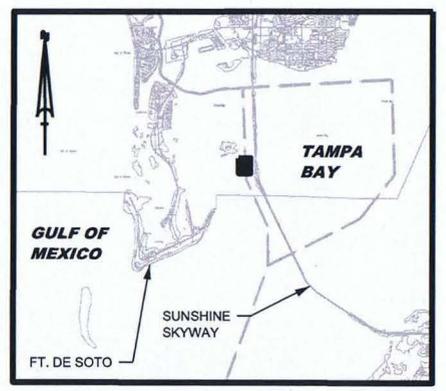
MATCHLINE - PLATE 19 - STA. 30+00

MATCHLINE - PLATE 17 - STA. 12+00



- NOTES:
1. REFER TO SURVEY NO. 10-097.
 2. SEE PLATE 14 FOR SURVEY NOTES.
 3. SEE PLATE 1 FOR GENERAL NOTES AND LEGEND

PERMIT # 305363001



KEY PLAN
NOT TO SCALE



US Army Corps of Engineers
Jacksonville District

PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FILE NAME:
GIWWFY11-C-PL-19.DGN

DATE:
MARCH 2011

SCALE:
AS SHOWN

DWN BY:
J.D.B.

DSN BY:
J.D.B.

CAD BY:
J.T.M.

GIWW CR - AR (CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3)
PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL

MAINTENANCE DREDGING FY11

9-FOOT PROJECT

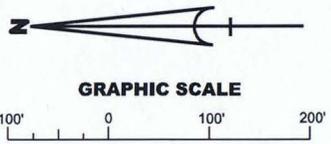
CUT SC-3

STA. 30+00 - STA. 47+00

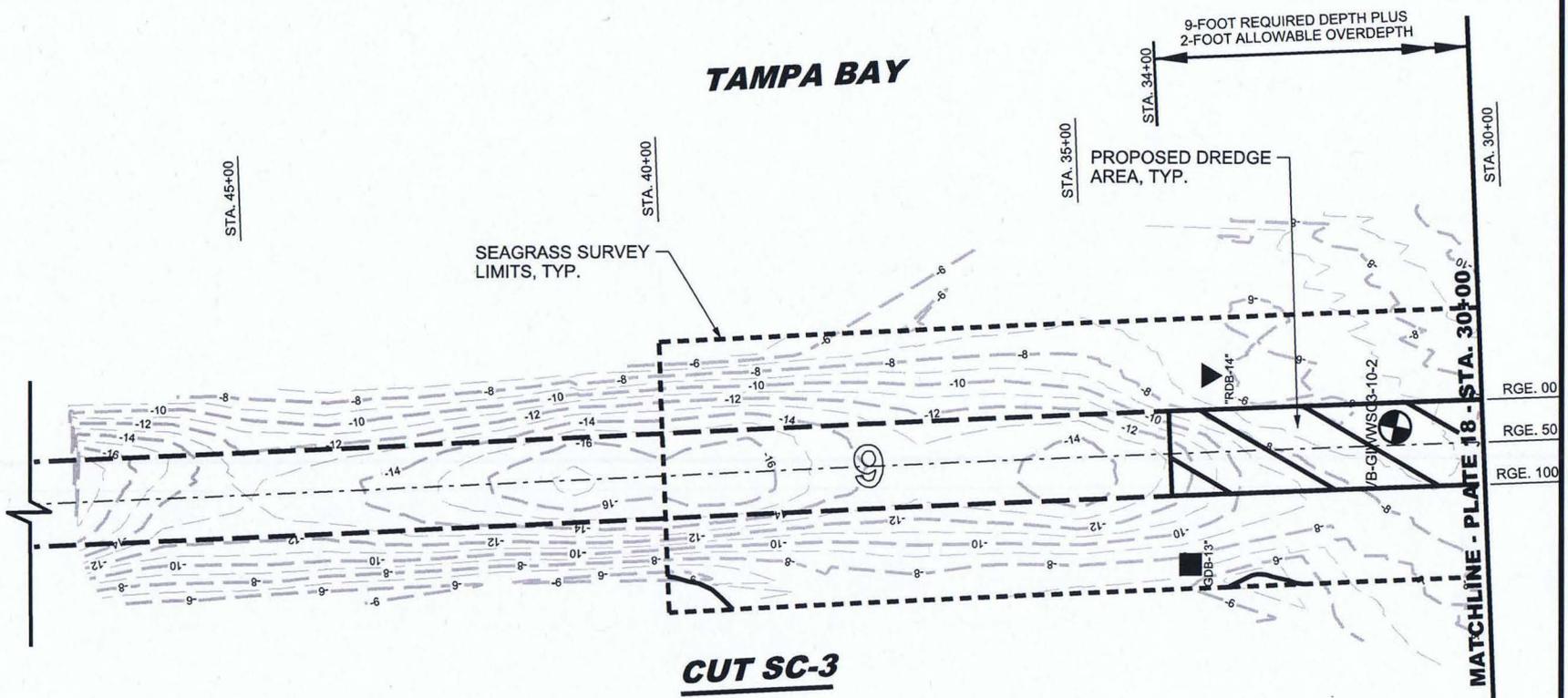
PLATE:

19

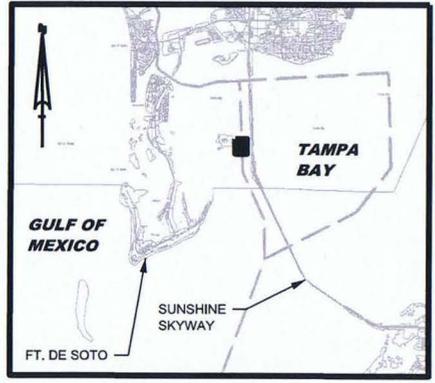
OF 22



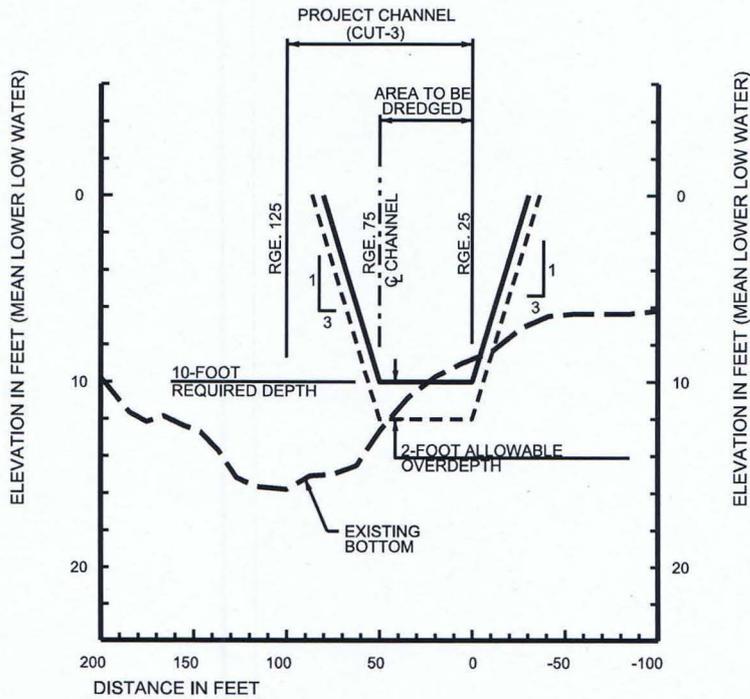
- NOTES:
1. REFER TO SURVEY NO. 10-097.
 2. SEE PLATE 14 FOR SURVEY NOTES.
 3. SEE PLATE 1 FOR GENERAL NOTES AND LEGEND



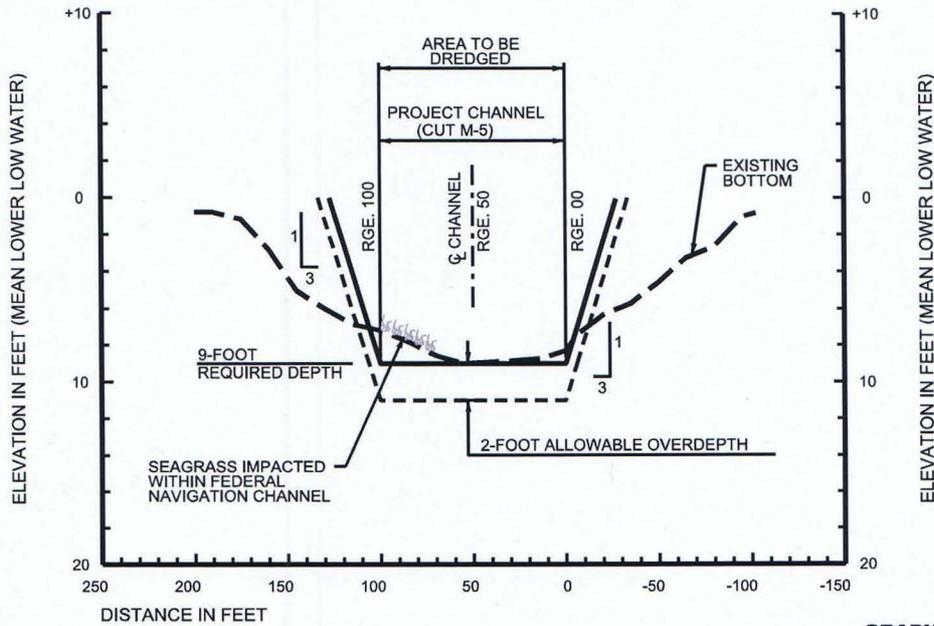
PERMIT # 905363001



KEY PLAN
NOT TO SCALE



1
PL-4 **STA. 18+50 CUT-3**
SCALES: HORIZ. "A"
VERT. "B"



2
PL-8 **STA. 30+00 CUT M-5**
SCALES: HORIZ. "A"
VERT. "B"

GRAPHIC SCALE "A"



GRAPHIC SCALE "B"



PERMIT # 305363001

- NOTES:
1. REFER TO SURVEY NO. 08-130 & 11-021.
2. SEE PLATE 3 & 6 FOR SURVEY NOTES.



US Army Corps
of Engineers
Jacksonville District

PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FILE NAME:
GIWWFY11-C-PL-20.DGN

DATED:
MARCH 2011

SCALE:
AS SHOWN

DWN BY:
J.D.B.

DSN BY:
J.D.B.

CKD BY:
J.T.M.

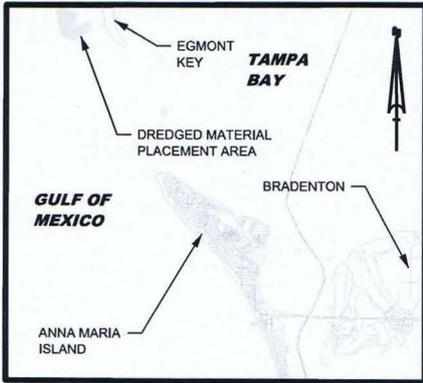
GIWW CR - AR (CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3)
PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL

MAINTENANCE DREDGING FY11
9-FOOT PROJECT

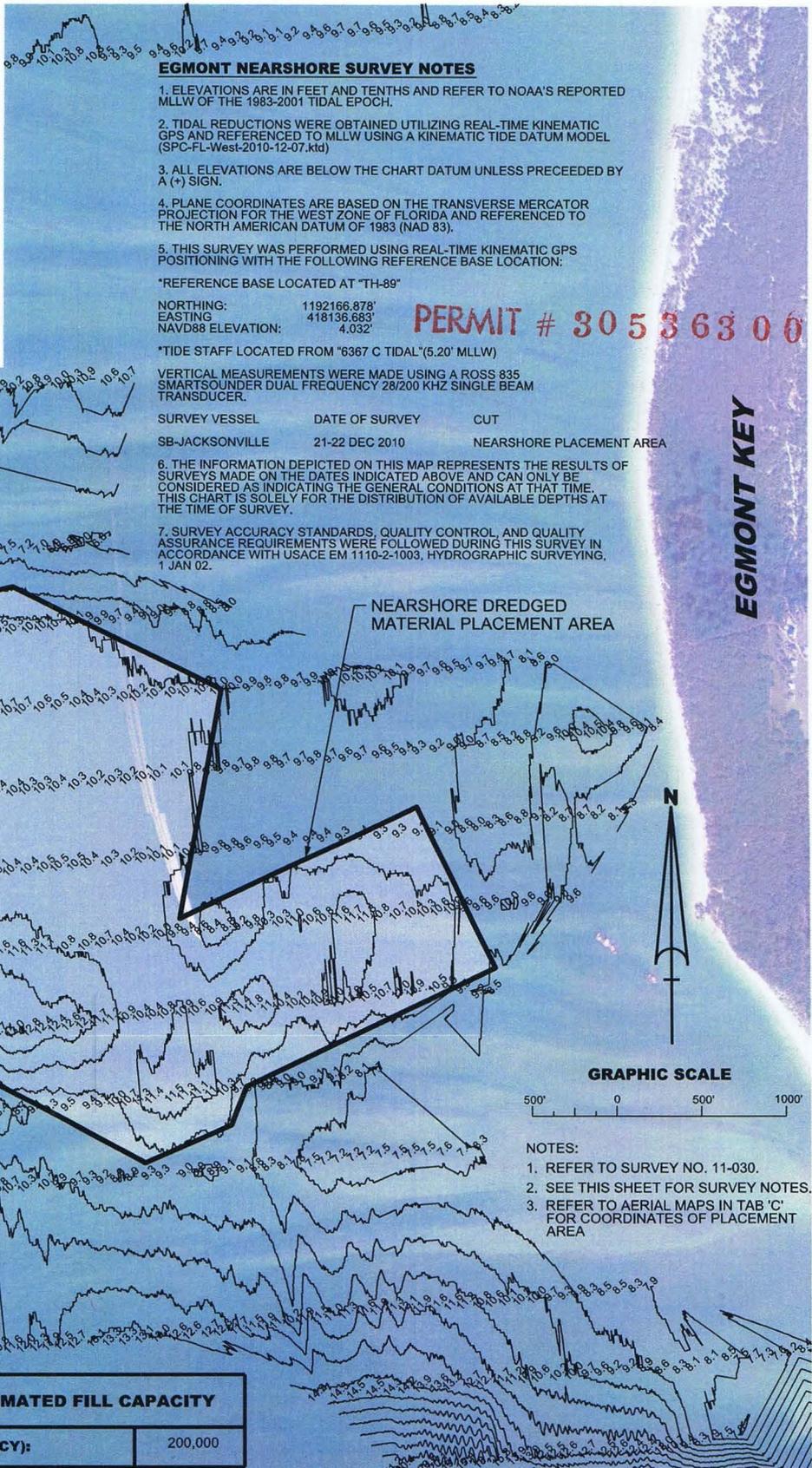
TYPICAL CROSS SECTIONS

PLATE:

20



KEY PLAN
NOT TO SCALE



EGMONT NEARSHORE SURVEY NOTES

1. ELEVATIONS ARE IN FEET AND TENTHS AND REFER TO NOAA'S REPORTED MLLW OF THE 1983-2001 TIDAL EPOCH.
2. TIDAL REDUCTIONS WERE OBTAINED UTILIZING REAL-TIME KINEMATIC GPS AND REFERENCED TO MLLW USING A KINEMATIC TIDE DATUM MODEL (SPC-FL-West-2010-12-07.ktd)
3. ALL ELEVATIONS ARE BELOW THE CHART DATUM UNLESS PRECEDED BY A (+) SIGN.
4. PLANE COORDINATES ARE BASED ON THE TRANSVERSE MERCATOR PROJECTION FOR THE WEST ZONE OF FLORIDA AND REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83).
5. THIS SURVEY WAS PERFORMED USING REAL-TIME KINEMATIC GPS POSITIONING WITH THE FOLLOWING REFERENCE BASE LOCATION:

*REFERENCE BASE LOCATED AT "TH-89"

NORTHING: 1192166.878'
EASTING 418136.683'
NAVD88 ELEVATION: 4.032'

PERMIT # 305863001

*TIDE STAFF LOCATED FROM "6367 C TIDAL"(5.20' MLLW)

VERTICAL MEASUREMENTS WERE MADE USING A ROSS 835 SMARTSOUNDER DUAL FREQUENCY 28/200 KHZ SINGLE BEAM TRANSDUCER.

SURVEY VESSEL	DATE OF SURVEY	CUT
SB-JACKSONVILLE	21-22 DEC 2010	NEARSHORE PLACEMENT AREA

6. THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED ABOVE AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS AT THAT TIME. THIS CHART IS SOLELY FOR THE DISTRIBUTION OF AVAILABLE DEPTHS AT THE TIME OF SURVEY.

7. SURVEY ACCURACY STANDARDS, QUALITY CONTROL, AND QUALITY ASSURANCE REQUIREMENTS WERE FOLLOWED DURING THIS SURVEY IN ACCORDANCE WITH USACE EM 1110-2-1003, HYDROGRAPHIC SURVEYING, 1 JAN 02.

NEARSHORE DREDGED MATERIAL PLACEMENT AREA

GRAPHIC SCALE



NOTES:

1. REFER TO SURVEY NO. 11-030.
2. SEE THIS SHEET FOR SURVEY NOTES.
3. REFER TO AERIAL MAPS IN TAB 'C' FOR COORDINATES OF PLACEMENT AREA

ESTIMATED FILL CAPACITY

TOTAL (CY):	200,000
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US Army Corps of Engineers
Jacksonville District

PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)

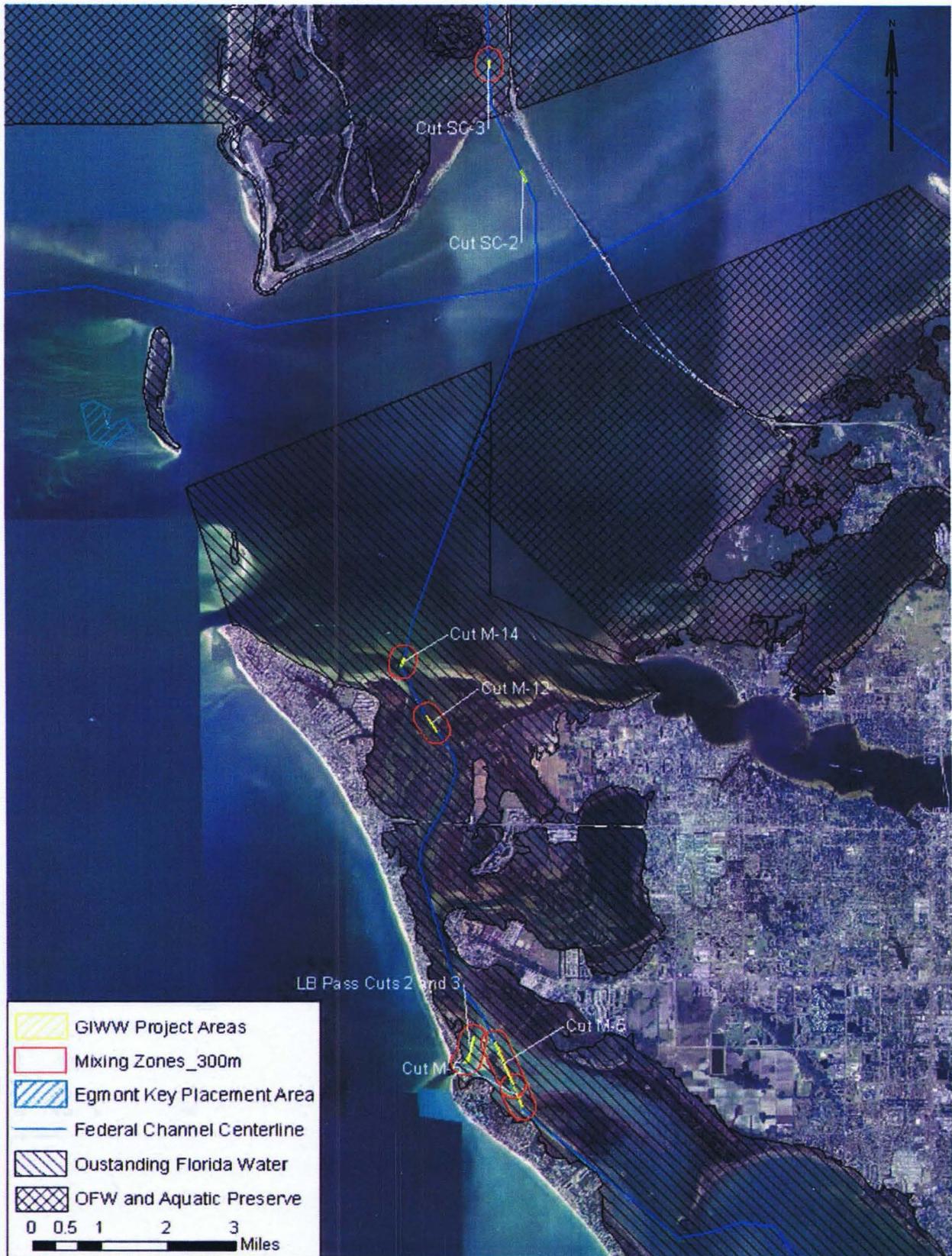
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FILE NAME:
GIWWFY11-C-PL-21.DGN
DATED:
MARCH 2011
SCALE:
AS SHOWN

DWN BY:
J.D.B.
DSN BY:
J.D.B.
CKD BY:
J.T.M.

GIWW CR - AR (CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3)
PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL
MAINTENANCE DREDGING FY11
9-FOOT PROJECT
EGMONT KEY - NEARSHORE DREDGED MATERIAL PLACEMENT AREA

PLATE:
21



US Army Corps
of Engineers
Jacksonville District

PERMIT DRAWINGS
(NOT FOR CONSTRUCTION)

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FILE NAME:
GIWWFY11-C-PL-02.DGN

DATED:
MARCH 2011

SCALE:
AS SHOWN

DWN BY:
J.D.B.

DSN BY:
J.D.B.

CKD BY:
J.T.M.

GIWW CR - AR (CUTS 2, 3, M-5, M-12, M-14, SC-2, SC-3)
PINELLAS, HILLSBOROUGH AND MANATEE COUNTY, FL

MAINTENANCE DREDGING FY11
9-FOOT PROJECT
MIXING ZONE MAP

PLATE:

22

OF 22

PERMIT # 305363001

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Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard, Jr.
Secretary

August 5, 2011

Eric P. Summa
Chief, Environmental Branch
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

NOTICE OF COMPLETENESS

DEP File Number: 0305363-001-JC and 002-BV, Multiple Counties
Applicant: U.S. Army Corps of Engineers
Project: GIWW – Longboat Pass to Sunshine Skyway Maint. Dredge

Dear Mr. Summa:

This is to acknowledge receipt of your response to the First Request for Additional Information on July 5, 2011, regarding an application for a joint coastal permit and authorization to use state-owned submerged lands. The project is to dredge the GIWW from Longboat Key with Sunshine Skyway Parkway, with nearshore placement at Egmont Key.

Based upon the submitted information, this application has been deemed complete. Pursuant to Section 120.60, F.S., and, if applicable, 15 CFR 930.62, final action on your application will be taken within 90 days of receipt of your last item of information (by October 3, 2011), unless you choose to waive this timeclock.

If you have any questions, please contact me at the letterhead address (add Mail Station 300), by e-mail at Lainie.edwards@dep.state.fl.us or by telephone at (850) 414-7796.

Sincerely,

Lainie Edwards, Ph.D.
Environmental Manager
Bureau of Beaches and Coastal Systems

Notice of Application Completeness
File No. 0305363-001-JC and 002-BV, Multiple Counties
GIWW – Longboat Pass to Sunshine Skyway Maint. Dredge
Page 2 of 2

cc: Paul Karch, USACE, Jacksonville
Amanda Lavigne, USACE, Jacksonville
Jim McAdams, USACE, Jacksonville
Kathleen McConnell, USACE, Jacksonville
Robbin Trindell, FWC, ISMS
Anne Richards, FWC, ISMS
Mary Duncan, FWC, ISMS
Bob Stetler, Hillsborough Co. EPC
Suzanne Cooper, Tampa Bay RPC
Ann Hodgson, Florida Audubon
Holly Greening, TBEP
Thomas Seal, DEP, BARS
Maryellen Edwards, DEP, SW District
Bill Vorstadt, DEP, SW District
Allyson Minick, DEP, SW District
Charles Kovach, DEP, SW District
Michael Barnett, Chief, BBCS
Martin Seeling, BBCS, JCP
Robert Brantly, BBCS, CE
Subarna Malakar, BBCS, CE
Jennifer Koch, BBCS, CE
Roxane Dow, BBCS, BECP
Randy Runnels, DEP
Catherine Florko, BBCS, BECP
Alex Reed, BBCS, BECP
Paden Woodruff, BBCS, BECP
JCP Compliance Officer
BBCS Permit File (hardcopy)

GIWW - LONGBOAT PASS ENVIRONMENTAL ASSESSMENT

APPENDIX D

CULTURAL RESOURCES COORDINATION AND RESPONSES

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REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

AUG 25 2010

Mr. Robert Thrower
Poarch Band of Creek Indians
Tribal Historic Preservation Officer
HCR 69A, Post Office Box 85B
Atmore, Alabama 36503

Dear Mr. Thrower:

The U.S. Army Corps of Engineers (Corps), Jacksonville District is proposing to perform maintenance dredging in the Gulf Intracoastal Water Way (GIWW) in Cuts M1-14, SC 2 and 3 and Cut 3 of Longboat Pass in Manatee, Hillsborough and Pinellas County, Florida (Figures 1 and 2).

The Corps has determined that this project has a potential to adversely affect unrecorded submerged historic properties and a submerged remote sensing cultural resources survey is needed. The purpose of the survey will be to determine if any resources exist within the project area and evaluate their significance. The determination for the need of a survey was based on background research and a visual inspection of the project area by Corps archeological staff.

I request your comments on this determination and welcome your input on the planned survey. If there are any questions, please contact Ms. Wendy Weaver at 904-232-2137 or e-mail at wendy.weaver@usace.army.mil.

Sincerely,

for

Eric P. Summa
Chief, Environmental Branch

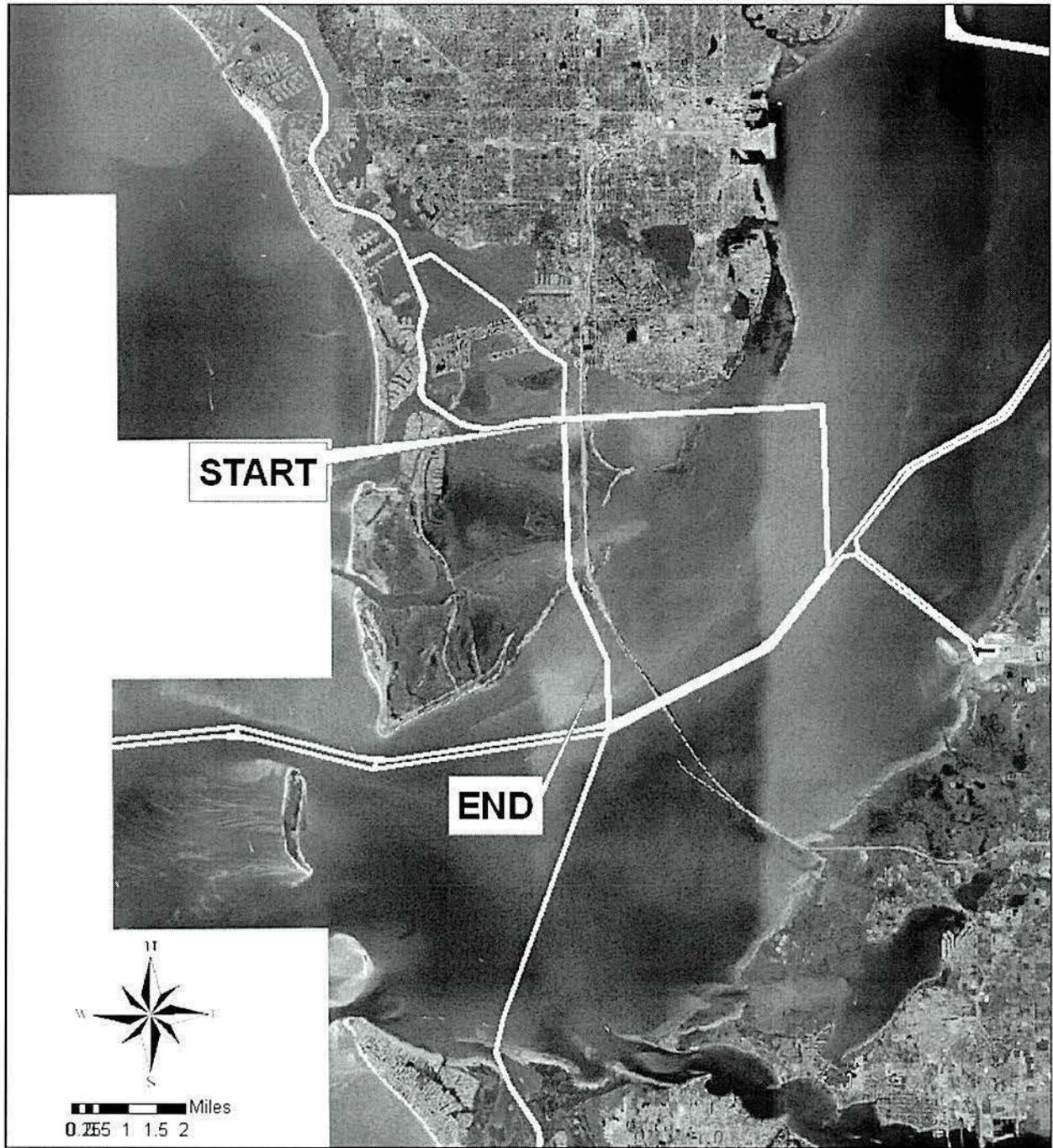


Figure 2. Gulf Intracoastal Water Way, Cuts SC 2 and 3



Figure 1. Gulf Intracoastal Water Way, Cuts M 1- 14 and Cut 3 of Longboat Pass.



REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

AUG 25 2010

Cultural Preservation Officer
Muscogee (Creek) Nation of Oklahoma
Post Office Box 580
Okmulgee, Oklahoma 74447

Dear Cultural Preservation Officer:

The U. S. Army Corps of Engineers (Corps), Jacksonville District is proposing to perform maintenance dredging in the Gulf Intracoastal Water Way (GIWW) in Cuts M1-14, SC 2 and 3 and Cut 3 of Longboat Pass in Manatee, Hillsborough and Pinellas County, Florida (Figures 1 and 2).

The Corps has determined that this project has a potential to adversely affect unrecorded submerged historic properties and a submerged remote sensing cultural resources survey is needed. The purpose of the survey will be to determine if any resources exist within the project area and evaluate their significance. The determination for the need of a survey was based on background research and a visual inspection of the project area by Corps archeological staff.

I request your comments on this determination and welcome your input on the planned survey. If there are any questions, please contact Ms. Wendy Weaver at 904-232-2137 or e-mail at wendy.weaver@usace.army.mil.

Sincerely,

A handwritten signature in cursive script, appearing to read "Eric P. Summa".

for Eric P. Summa
Chief, Environmental Branch



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

AUG 25 2010

Mr. William Steele
Tribal Historic Preservation Officer
Seminole Tribe of Florida
Ah Tha Thi Ki Museum
HC 61, Box 31A
Clewiston, Florida 33440

Dear Mr. Steele:

The U.S. Army Corps of Engineers (Corps), Jacksonville District is proposing to perform maintenance dredging in the Gulf Intracoastal Water Way (GIWW) in Cuts M1-14, SC 2 and 3 and Cut 3 of Longboat Pass in Manatee, Hillsborough and Pinellas County, Florida (Figures 1 and 2).

The Corps has determined that this project has a potential to adversely affect unrecorded submerged historic properties and a submerged remote sensing cultural resources survey is needed. The purpose of the survey will be to determine if any resources exist within the project area and evaluate their significance. The determination for the need of a survey was based on background research and a visual inspection of the project area by Corps archeological staff.

I request your comments on this determination and welcome your input on the planned survey. If there are any questions, please contact Ms. Wendy Weaver at 904-232-2137 or e-mail at wendy.weaver@usace.army.mil.

Sincerely,

A handwritten signature in cursive script, appearing to read "Eric P. Summa".

for Eric P. Summa
Chief, Environmental Branch



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

AUG 25 2010

Mr. Scott Stroh, Director
Division of Historical Resources
State Historic Preservation Officer
500 South Bronough Street
Tallahassee, Florida 32399-0250

Dear Mr. Stroh:

The U.S. Army Corps of Engineers (Corps), Jacksonville District is proposing to perform maintenance dredging in the Gulf Intracoastal Water Way (GIWW) in Cuts M1-14, SC 2 and 3 and Cut 3 of Longboat Pass in Manatee, Hillsborough and Pinellas County, Florida (Figures 1 and 2).

The Corps has determined that this project has a potential to adversely affect unrecorded submerged historic properties and a submerged remote sensing cultural resources survey is needed. The purpose of the survey will be to determine if any resources exist within the project area and evaluate their significance. The determination for the need of a survey was based on background research and a visual inspection of the project area by Corps archeological staff.

I request your comments on this determination and welcome your input on the planned survey. If there are any questions, please contact Ms. Wendy Weaver at 904-232-2137 or e-mail at wendy.weaver@usace.army.mil.

Sincerely,

A handwritten signature in cursive script, appearing to read "Eric P. Summa".

for Eric P. Summa
Chief, Environmental Branch



REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

AUG 25 2010

Mr. Steve Terry
Miccosukee Tribe of Indians of Florida
Post Office Box 440021
Tamiami Station
Miami, Florida 33144

Dear Mr. Terry:

The U.S. Army Corps of Engineers (Corps), Jacksonville District is proposing to perform maintenance dredging in the Gulf Intracoastal Water Way (GIWW) in Cuts M1-14, SC 2 and 3 and Cut 3 of Longboat Pass in Manatee, Hillsborough and Pinellas County, Florida (Figures 1 and 2).

The Corps has determined that this project has a potential to adversely affect unrecorded submerged historic properties and a submerged remote sensing cultural resources survey is needed. The purpose of the survey will be to determine if any resources exist within the project area and evaluate their significance. The determination for the need of a survey was based on background research and a visual inspection of the project area by Corps archeological staff.

I request your comments on this determination and welcome your input on the planned survey. If there are any questions, please contact Ms. Wendy Weaver at 904-232-2137 or e-mail at wendy.weaver@usace.army.mil.

Sincerely,

A handwritten signature in cursive script, appearing to read "Eric P. Summa".

for Eric P. Summa
Chief, Environmental Branch



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

AUG 25 2010

Mr. Pare Bowlegs
Tribal Historic Preservation Officer
Seminole Nation of Oklahoma
Post Office Box 1498
Seminole, Oklahoma 74884

Dear Mr. Bowlegs:

The U.S. Army Corps of Engineers (Corps), Jacksonville District is proposing to perform maintenance dredging in the Gulf Intracoastal Water Way (GIWW) in Cuts M1-14, SC 2 and 3 and Cut 3 of Longboat Pass in Manatee, Hillsborough and Pinellas County, Florida (Figures 1 and 2).

The Corps has determined that this project has a potential to adversely affect unrecorded submerged historic properties and a submerged remote sensing cultural resources survey is needed. The purpose of the survey will be to determine if any resources exist within the project area and evaluate their significance. The determination for the need of a survey was based on background research and a visual inspection of the project area by Corps archeological staff.

I request your comments on this determination and welcome your input on the planned survey. If there are any questions, please contact Ms. Wendy Weaver at 904-232-2137 or e-mail at wendy.weaver@usace.army.mil.

Sincerely,

A handwritten signature in cursive script, appearing to read "Eric P. Summa".

for Eric P. Summa
Chief, Environmental Branch



FLORIDA DEPARTMENT OF STATE

Dawn R. Roberts

Interim Secretary of State

DIVISION OF HISTORICAL RESOURCES

Mr. Eric Summa
Planning Division
Jacksonville USACE
P.O. Box 4970
Jacksonville, Florida 32232-0019

September 30, 2010

Re: DHR Project File No. 2010-04428/ Received by DHR: August 30, 2010
Project: Gulf Intracoastal Water Way Maintenance Dredge
Counties: Manatee, Hillsborough, Pinellas

Dear Mr. Summa:

Our office received and reviewed the above referenced project application in accordance with Section 106 of the National Historic Preservation and the National Environmental Policy Acts as amended, to assess possible adverse impacts to cultural resources (any prehistoric or historic district, site, building, structure, or object) listed, or eligible for listing, in the National Register of Historic Places.

Our office concurs with the recommendations of your agency for the necessity for submerged remote sensing cultural resource surveys of the area of potential effect for the proposed project. We look forward to reviewing the resultant survey report(s). The resultant survey report must conform to the specification set forth in Chapter 1A-46, *Florida Administrative Code*, and be forwarded to this agency in order to complete the review and consultation processes for this undertaking and its impacts to historic properties. The results of the analysis will determine if significant cultural resources would be disturbed by this development. In addition, if significant remains are located, the data described in the report and the consultant's conclusions will assist this office in determining measures that must be taken to avoid or minimize adverse impacts to archaeological sites and historical properties identified that are eligible for listing in the NRHP.

If you have any questions concerning our comments, please contact Michael Hart, Historic Sites Specialist, by phone at 850.245.6333, or by electronic mail at mrhart@dos.state.fl.us. Your continued interest in protecting Florida's historic properties is appreciated.

Sincerely,

Laura A. Kammerer
Deputy State Historic Preservation Officer
For Review and Compliance

500 S. Bronough Street • Tallahassee, FL 32399-0250 • <http://www.flheritage.com>

Director's Office
850.245.6300 • FAX: 245.6436

Archaeological Research
850.245.6444 • FAX: 245.6452

Historic Preservation
850.245.6333 • FAX: 245.6437

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GIWW - LONGBOAT PASS ENVIRONMENTAL ASSESSMENT

APPENDIX E

COORDINATION DOCUMENTS

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DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

MAR 23 2011

Mr. Dave Hankla
U. S. Fish & Wildlife Service
North Florida Field Office
7915 Baymeadows Way, Suite 200
Jacksonville, FL 32256-7517

Dear Mr. Hankla:

I am requesting informal consultation pursuant to Section 7 of the Endangered Species Act for the Maintenance Dredging of the Gulf Intracoastal Waterway Caloosahatchee River to Anclote River (GIWW CR to AR) and Longboat Pass, located in Manatee County, Florida.

The U.S. Army Corps of Engineers (Corps), Jacksonville District, is proposing to conduct maintenance dredging of specific segments the GIWW CR to AR (Cuts M-5, M-12 and M-14), and also Longboat Pass (Cuts 2 and 3), see enclosures. The local sponsor is the West Coast Navigational District. The proposed placement location for the dredged material is in the nearshore environment of Egmont Key from at least 1500-ft to 5000-ft west of the shoreline, see enclosure.

The preferred alternative consists of dredging the shoaled areas in the above-referenced channel cuts. The required dredging depth is 9-ft to 10-ft MLLW, with an allowable overdepth of 2 feet; therefore the maximum is not to exceed 12-ft MLLW. The total quantity to be dredged is approximately 30,000 C.Y. of material. All material shall be placed by split-hull discharge into the nearshore area west of Egmont Key. No placement of dredged material will occur on the beach area of Egmont Key; therefore, no impact to critical habitat for piping plover (*Charadrius melodus*) as a result of this action. Additionally, since the material is being placed in the nearshore, no adverse affect to nesting sea turtles is anticipated as a result of this action.

After reviewing available data, the Corps has determined that the proposed project may affect but is not likely to adversely affect the endangered Florida manatee (*Trichechus manatus*). The Corps makes this determination due to the implementation of the standard manatee protection measures in our plans and specifications for the project. Based on this information, we request that you concur with this finding.

Sea Turtles: Green Turtle (<i>Chelonia mydas</i>) Loggerhead (<i>Caretta caretta</i>) Kemp's ridley (<i>Lepidochelys</i>) Hawksbill (<i>Eretmochelys</i>)	may affect/not likely to adversely affect
Florida Manatee (<i>Trichecus manatus</i>)	may affect/not likely to adversely affect

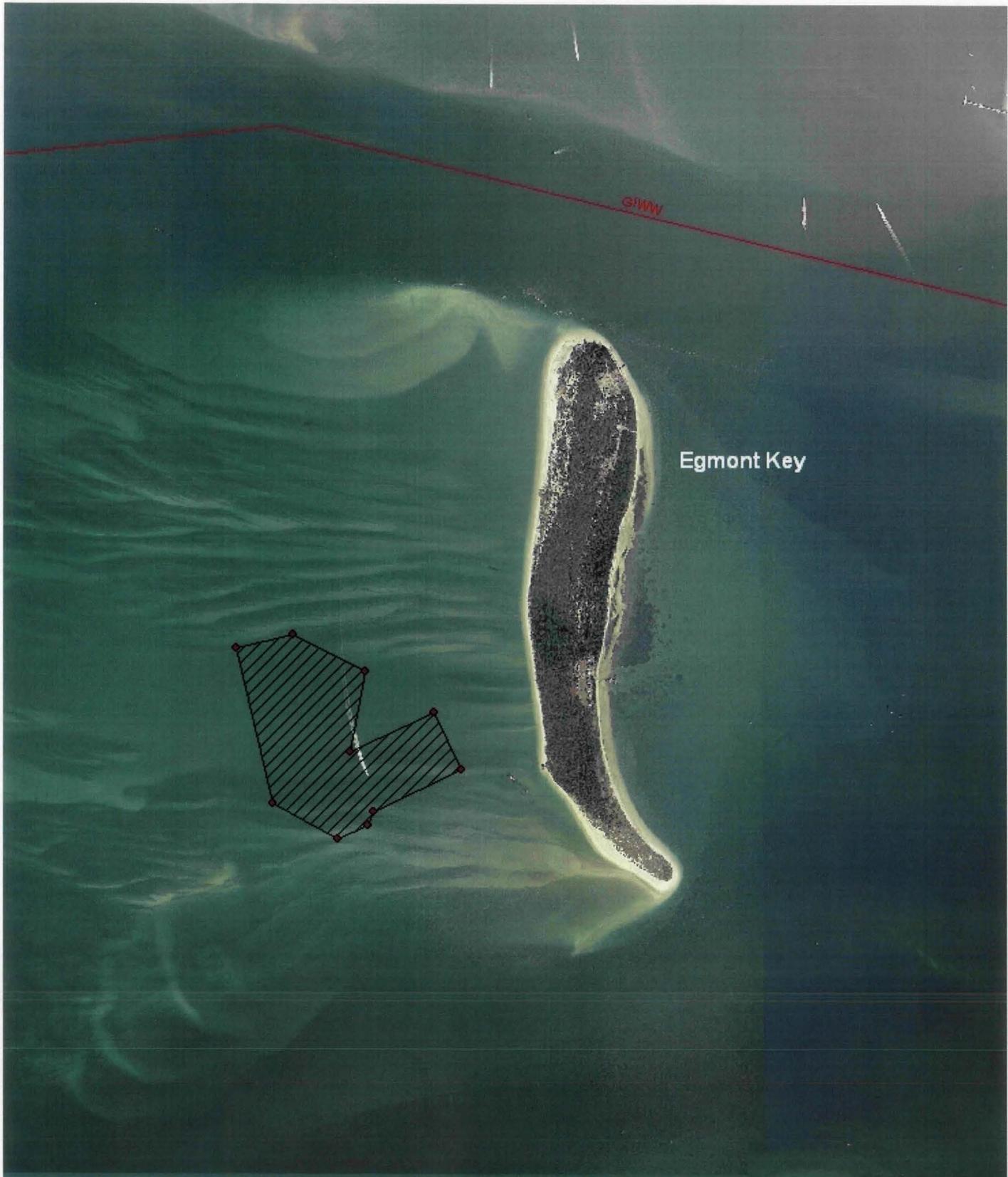
If you have any questions, please contact Ms. Kathleen McConnell at (904) 232-3607 or by email at kathleen.k.mcconnell@usace.army.mil.

Sincerely,



for
Eric P. Summa
Chief, Environmental Branch

Enclosure



Egmont Key

Legend

-  Egmont Key Placement Area
 -  Federal Channel Centerline
- 0 0.2 0.4 0.8
 Miles



EGMONT KEY PLACEMENT AREA	
JCP PERMIT APPLICATION	
GWW-Longboat Pass, Anna Maria, and Sunshine Skyway	
Scale: As Shown	Drawn By: ABL
Date: February 2011	Figure 5 of 5





Legend

 GIWW-Longboat Project Areas

 Federal Channel Centerline

0 0.125 0.25 0.5
Miles



LONGBOAT PASS CUTS 2 & 3, GMW CUT M-5

JCP PERMIT APPLICATION

GIWW-Longboat Pass, Anna Maria, and
Sunshine Skyway

Scale: As Shown

Drawn By: ABL

Date: February 2011

Figure 2 of 5



US Army Corps
of Engineers
Jacksonville District



Legend

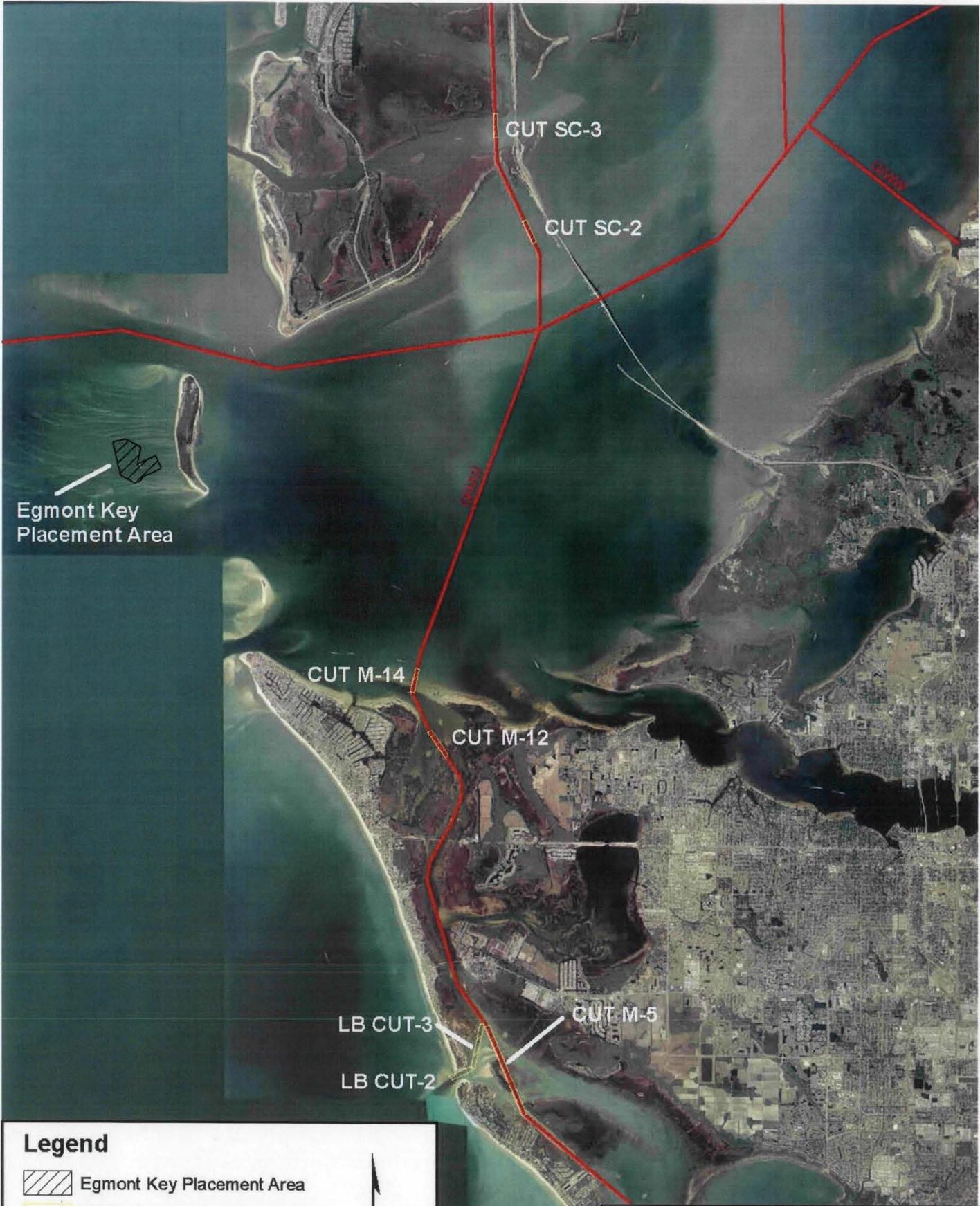
-  GIWW-Longboat Project Areas
-  Federal Channel Centerline

0 0.375 0.75 1.5 Miles



GIWW CUTS M-12 AND M-14 JCP PERMIT APPLICATION GIWW-Longboat Pass, Anna Maria, and Sunshine Skyway	
Scale: As Shown	Drawn By: ABL
Date: February 2011	Figure 3 of 5





Legend

-  Egmont Key Placement Area
-  GIWW-Longboat Project Areas
-  Federal Channel Centerline

0 1 2 4 Miles

AERIAL OF PROJECT EXTENT
 JCP PERMIT APPLICATION
 GIWW-Longboat Pass, Anna Maria, and
 Sunshine Skyway
 Scale: As Shown
 Date: February 2011

Drawn By: ABL
 Figure 1 of 5





United States Department of the Interior

U. S. FISH AND WILDLIFE SERVICE

7915 BAYMEADOWS WAY, SUITE 200
JACKSONVILLE, FLORIDA 32256-7517

IN REPLY REFER TO:

FWS Log No. 41910-2011-I-0210

August 2, 2011

Colonel Alfred A. Pantano, Jr. District Engineer
U.S. Army Corps of Engineers
Regulatory Division, North Permits Branch
P.O. Box 4970
Jacksonville, Florida 32232-0019
(Attn: Kathleen McConnell)

Dear Colonel Pantano:

The U.S. Fish and Wildlife Service (Service) reviewed the proposed maintenance dredging of approximately 106,305 cubic yards of material from the Gulf Intracoastal Waterway (GIWW) with nearshore placement proposed off of Egmont Key (projected for 1500 to 5000 feet west of the Egmont Key shoreline) located in Hillsborough County, Florida, and its effects on the loggerhead (*Caretta caretta*), green (*Chelonia mydas*), Kemp's ridley (*Lepidochelys kempi*), and hawksbill (*Eretmochelys imbricata*) sea turtles in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Your letter dated March 23, 2011 requesting informal consultation was received on March 25, 2011.

The Corps determined that the proposed project "may affect, but is not likely to adversely affect" the West Indian manatee (*Trichechus manatus latirostris*) with the inclusion of the Standard Manatee Construction Conditions (2011) and would have "no effect" on piping plover (*Charadrius melodus*) critical habitat because no material would be placed directly on the beach at Egmont Key. In addition, the Corps determined that the proposed project "may affect but is not likely to adversely affect" the loggerhead, green, Kemp's ridley, and hawksbill sea turtles.

The Service has determined that the project "may affect but is not likely to adversely affect" the piping plover because no equipment will be placed on the beach. Sand from the nearshore placement is expected to drift on to Egmont Key, which is piping plover Critical Habitat Unit FL-21. This is expected to occur in small amounts over a period of time. Based on this, the Service has determined that the project "may affect but is not likely to adversely modify" Critical Habitat Unit FL-21.

The Service also has determined that the project “may affect and is likely to adversely affect” the loggerhead and green sea turtle because they have historically nested along the shoreline at Egmont Key. Kemp’s ridley and hawksbill sea turtles have not been documented nesting in this area. The Service has determined that the proposed project is appropriate to apply to the Statewide Programmatic Biological Opinion (SPBO) concerning navigation maintenance dredging activities along the coast of Florida for the Corps dated April 19, 2011 (FWS Log No. 41910-2011-F-0170). The minimization measures, Reasonable and Prudent Measures, and Terms and Conditions in the SPBO are applicable to the proposed project and must be followed for the loggerhead and green sea turtles. We have assigned log number FWS 41910-2011-I-0210 to this individual consultation.

The following measures will also be taken to prevent the introduction of Norway rats onto Egmont Key:

- Baiting and trapping of rats will occur on the dredge beginning two weeks prior to project commencement, and it will continue through the completion of activities at Egmont Key.
- Any equipment placed on the island or operated within half a mile of the island will be inspected by a licensed exterminator before it is allowed to be mobilized to Egmont Key.
- Rat guards (conical plastic or metal plate guards) will be installed on any mooring lines installed to the island or nearshore to provide a barrier to rats traveling on the rope from the dredge/barges/boats.

Please submit a report for the proposed project as described in the SPBO Terms and Conditions B19, following completion of the proposed work.

Thank you for your cooperation in the effort to conserve fish and wildlife resources. Should you have any questions or require clarification regarding this letter, please contact Terri Calleson of this office at (904) 731-3286.

Sincerely,



David L. Hankla
Field Supervisor

cc:

DEP, Tallahassee, Florida (Lanie Edwards)

FWC, Imperiled Species Management Section, Tallahassee, Florida (Robbin Trindell)

NOAA Fisheries, St. Petersburg, Florida (Dennis Klemm)

Service, Atlanta, Georgia (Kenneth Graham)

Service, National Sea Turtle Coordinator (Sandy MacPherson)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4
SAM NUNN
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA GEORGIA 30303-8960

August 4, 2011

Mr. Eric P. Summa
Chief, Environmental Branch, Planning Division
Jacksonville District
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Subject: Review of the Environmental Assessment for Maintenance Dredging of Gulf Intracoastal Waterway (GIWW) Cuts M-5, M-12, and M-14, & Longboat Pass Cuts LP-2 and LP-3; Maintenance Dredging with Nearshore Material Placement, Manatee and Hillsborough Counties, FL

Dear Mr. Summa:

Consistent with Section 102(2)(c) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the U.S. Environmental Protection Agency (EPA) has reviewed the Environmental Assessment (EA) for long-term, ongoing maintenance dredging within the Gulf Intracoastal Waterway (GIWW) and Longboat Pass located in Manatee County, Florida. EPA understands that when a Federal navigation project is authorized, it is generally the responsibility of the Corps to maintain the channel. The GIWW from the Caloosahatchee River to the Anclote River, Florida was authorized at 100 feet wide by 9 feet deep, and Longboat Pass was authorized (at 12-foot-deep by 150 feet wide from the Gulf of Mexico to Longboat Pass Bridge; thence, 10-foot deep by 100 feet wide to and along the GIWW to the Cortez Bridge (which divides Anna Maria Sound from Sarasota Bay). The project consists of two components: the Federal navigation channel included in the dredging activity, and the placement of the dredged material.

The dredged material placement will occur in the nearshore environment approximately 1,500 – 5,000 linear feet from the western shoreline of Egmont Key, which is located about 12.5 miles north of the dredge site at the mouth of Tampa Bay in Hillsborough County, Florida. In the event that a cutterhead dredge with a discharge pipeline will be used for dredged material placement, the material may be placed along the shoreline of Longboat Key, approximately 7,600 feet south of Longboat Pass, between Florida Environmental Protection (FDEP) Monuments R-44 and R-51.

EPA notes that an interdisciplinary Corps of Engineers team “used a systematic approach to analyze the affected area, evaluate the environmental effects, and to write the

EA.” The analysis included literature research, field investigations, and coordination with resource agencies and private groups having expertise with the relevant issues. The Corps of Engineers appropriately considered the following issues in the EA:

- a. Water quality
- b. Endangered Species and Critical Habitat
- c. Historic properties
- d. Noise
- e. Safety
- f. Fish and wildlife resources
- g. Essential Fish Habitat (EFH)
- h. Recreation
- i. Navigation
- j. Economics
- k. Coral Reefs (no coral reefs located in the project area)
- l. Wetlands (none would be affected by the proposed project)

Besides the EPA, we note that the Corps of Engineers team coordinated with other key agencies as required, including the U.S. Fish and Wildlife Service (FWS), NOAA’s National Marine Fisheries Service (NMFS), Florida Fish and Wildlife Conservation Commission (FWC), and the Florida State Historic Preservation Officer (SHPO). Section 7 consultation was reportedly initiated on March 23, 2011 with the US Fish and Wildlife Service (USFWS), and their responses are included in Appendix E (pending). The Corps of Engineers believes the project is fully coordinated under the ESA and is in full compliance with the Act.

The Corps of Engineers team appropriately considered the following 3 alternatives. The Preferred Alternative will be dependent upon the type of equipment provided by Corps or contractor at time of award.

- No action
- Maintenance dredging of GIWW Cuts M-5, M-12, and M-14, and Longboat Pass Cuts 2 and 3 by use of a hopper dredge, with disposal in the nearshore area of Egmont Key
- Maintenance dredging of GIWW Cuts M-5, M-12, and M-14, and Longboat Pass Cuts 2 and 3 by use of a suction-cutterhead dredge with disposal placement along the shoreline of Longboat Key between DEP markers R 44 and R51

Regarding dredged material placement opportunities, Egmont Key has been reported as having the most critical need for sand placement and can accommodate deposition from a split-hull hopper dredge. The Corps of Engineers reports that the western portion of the island is experiencing significant erosion, and USFWS has expressed interest in obtaining suitable dredged materials for use in replenishing the eroding sand. Based upon these factors, Egmont Key has been considered the best option

for the disposal of dredged materials for this project. The nearshore of Egmont Key will be used rather than beach placement to “accommodate the discharge operation from a split-hull hopper dredge.” In the unlikely event that a hopper dredge will not be used for removal of material within the previously referenced channels, the Corps of Engineers reports that discharge by pipeline from a cutterhead dredge will occur along the shoreline of Longboat Key below mean lower low water (MLLW) line to also avoid impacts to nesting sea turtles.

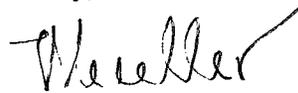
In addition to the above factors already considered by the Corps of Engineers for this Environmental Assessment, EPA notes that the document appropriately reviews the impairment status (e.g., 303d List) of area waterbodies, and discusses Total Maximum Daily Load studies (TMDLs). Sarasota Bay, at the location of Anna Maria Island and Longboat Key, has a Florida Surface Water Quality Classification of Class II, and this classification also applies to Egmont Key. A Class II waterbody is defined as having sufficient water quality for shellfish propagation or harvesting. For Sarasota Bay, the impairment causing the degradation in water quality is identified as nutrients, which are among the leading source of degradation of Florida water resources. Turbidity has also been considered in the EA, and water clarity was measured (on December 8, 2010) and the surface water had clear visibility to 8.2 feet. Historically, the range “has been from less than one foot to greater than 17 feet.” Turbidity was measured on this same date at 1.9 NTU.

The EA notes that temporary air pollution, water turbidity, and noise pollution increases can be expected during project construction. The dredge equipment will have a temporary effect until completion of the project. The Preferred Alternative – Hopper Dredge would result in turbidity generated at both the dredging and disposal sites. The Preferred Alternative – Cutterhead Dredge would result in similar effects to turbidity and benthic organisms as described above for Preferred Alternative – Hopper Dredge. In addition, there would be a short-term disruption to recreational and commercial navigation and fishing in the Federal navigational channel in Sarasota Bay and on the western shoreline of Longboat Key from the presence and operation of the dredged material transport and disposal operations. EPA recommends that any Best Management Practices (BMPs) that will be implemented to control turbidity during construction should be cited in the Final EA.

EPA notes that an assessment of the project’s potential effects on Essential Fish Habitat (EFH) is appropriately included within this EA in Section 4.7, but final comments from NMFS are still pending. Although not likely, if NMFS ends up objecting to the Department of the Army’s authorization of this activity, EPA requests notification of the same. Any NMFS comments should be added to the Final EA when provided.

We appreciate the opportunity to review the project. EPA requests a copy of the signed Finding of No Significant Impact (FONSI) for our files when/if it is eventually issued for this project. Should you have questions, feel free to coordinate with Paul Gagliano, P.E., of my staff, at 404/562-9373 or at gagliano.paul@epa.gov, or EPA Region 4's Eric Hughes, located in your Jacksonville District office.

Sincerely,

A handwritten signature in black ink, appearing to read "Mueller", with a long, sweeping horizontal stroke extending to the right.

Heinz J. Mueller, Chief
NEPA Program Office
Office of Policy and Management

cc David Pritchett, USEPA Region 4 -Jacksonville District office



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

JUL 21 2011

Planning Division
Environmental Branch

Mr. Mark Thompson
NOAA Fisheries Service
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701

Dear Mr. Thompson:

Pursuant to the National Environmental Policy Act (NEPA), enclosed for your review and comment is a copy of the draft Environmental Assessment (EA) for the Gulf Intracoastal Waterway (GIWW) Cuts M-5, M-12, and M-14, & Longboat Pass Cuts LP-2 and LP-3 Maintenance Dredging with Nearshore Material Placement Project, Manatee and Hillsborough Counties, Florida. The Corps is the lead consultant on this action.

Included throughout the EA is information which constitutes the Essential Fish Habitat (EFH) Assessment as required by the 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). Sections 2.6; 3.4; 4.7; 5.3; 5.16; and 5.19 of the enclosed NEPA document constitute our Essential Fish Habitat Assessment in accordance with procedures between our agencies as stated in the May 3, 1999 Statement of Findings. Based on analysis discussed in the EA, the U.S. Army Corps of Engineers has determined that the nearshore material placement of dredged material would not adversely affect the essential habitat of species managed under this Act.

We request your comments pursuant to NEPA and the MSFCMA by August 7, 2011. If you have any questions or need further information, please contact Ms. Kathleen McConnell at 904-232-3607 or by email: Kathleen.k.mcconnell@usace.army.mil.

Sincerely,

Eric P. Summa
Chief, Environmental Branch

Enclosure

CF (w/encl):

Mr Mark Smarek; National Marine Fisheries Service – Habitat Conservation Division, 263
13th Avenue South, St. Petersburg, Florida 33701- 5505 (by Fedex)

Spinning/CESAJ-PD-EC
Mora/CESAJ-DP
Summa/CESAJ-PD-E

From: Mark.Sramek@noaa.gov
To: McConnell, Kathleen K. SAJ
Cc: Karch, Paul J SAJ; Edwards, Lainie; Mora, Millan A SAJ; Jordan-Sellers, Terri SAJ; Spinning, Jason J SAJ
Subject: Re: GIWW - Longboat Pass EFH Coordination (UNCLASSIFIED)
Date: Monday, November 14, 2011 12:10:48 PM

NOAA's National Marine Fisheries Service (NMFS), Southeast Region, Habitat Conservation Division, has reviewed the subject Department of the Army, Corps of Engineers (COE), Jacksonville District (JAX), Planning Division's Environmental Assessment (EA) dated July 2011, regarding the "Gulf Intracoastal Waterway (GIWW) Cuts M-5, M-12, and M-14, & Longboat Pass Cuts LP-2 and LP-3 Maintenance Dredging With Nearshore Material Placement in Manatee and Hillsborough Counties, Florida." NMFS had previously provided EFH conservation recommendations to your office in response to the July 2011 EA regarding the project on October 25, 2011. Since receipt of the EA, NMFS has continued to consult with local, state and NOAA Restoration Center (RC) staff in reviewing the adequacy of the submerged aquatic vegetation (SAV) mitigation plan. Through multiple subsequent email and telephone communications with your staff, we have worked cooperatively with the COE JAX Planning Division to resolve outstanding issues with the initial SAV mitigation plan. Previously identified deficiencies in the SAV mitigation plan included: 1) questions regarding the effectiveness of the proposed use of bird stakes in Tampa Bay to restore seagrasses; 2) the potential for natural recruitment of SAV in the shallow existing prop scars at the mitigation site; and 3) and the long term viability of restored seagrass habitats given the frequency of small recreational boat traffic throughout the proposed mitigation site.

Based on our review of the COE JAX Planning Division's subsequent email from Ms. Terri Jordan-Sellers dated October 26, 2011, the COE has indicated flexibility in developing a final SAV mitigation plan in coordination with NMFS and NOAA RC staff. Therefore, the respective project revisions adequately address and are consistent with the recommendations previously provided to your office through an electronic mail message from Mr. Mark Sramek, dated October 25, 2011. Finally, in the spirit of better communication and cooperation, NMFS requests the COE JAX Planning Division coordinate any similar future actions through our office earlier during the planning process.

Thank you for your consideration of these comments. This satisfies the consultation procedures outlined in 50 CFR Section 600.920, of the regulation to implement the EFH provisions of the Magnuson-Stevens Fishery Conservation and Management Act.

----- Original Message -----

From: "McConnell, Kathleen K. SAJ" <Kathleen.K.Mcconnell@usace.army.mil>
Date: Monday, November 7, 2011 11:02 am
Subject: GIWW - Longboat Pass EFH Coordination (UNCLASSIFIED)
To: Mark Sramek <Mark.Sramek@noaa.gov>
Cc: "Karch, Paul J SAJ" <Paul.J.Karch@usace.army.mil>, "Edwards, Lainie" <Lainie.Edwards@dep.state.fl.us>, "Mora, Millan A SAJ" <Millan.A.Mora@usace.army.mil>, "Jordan-Sellers, Terri SAJ" <Terri.Jordan-Sellers@usace.army.mil>, "Spinning, Jason J SAJ" <Jason.J.Spinning@usace.army.mil>

- > Classification: UNCLASSIFIED
- > Caveats: NONE
- >
- > HI Mark:
- >
- > I just wanted to follow up with you regarding the mitigation plan for
- > GIWW Longboat Pass. As we spoke two weeks ago, the plan in a
- > conceptual form would be acceptable to NMFS along with the conditions
- > outlined during our last conversation and follow up e mail of 24 - 25
- > October 2011.
- >
- > As you will recall, we are anticipating receiving the EFH final
- > coordination from you on or before November 15, 2011, which is next

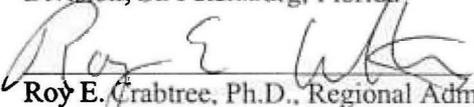
- > Tuesday. Meanwhile, the Corps is pursuing the issuance of the FDEP
- > Water Quality Certification, which also hinges upon the mitigation
- > plan as proposed.
- >
- > Please let me know the status of the EFH coordination so that
- > possibly Lainie Edwards can also move forward on the issuance of the
- > permit.
- >
- > Call me if you have any questions. Thanks for your attention to this
- > detail.
- >
- > Kathleen "Kat" McConnell
- > Biologist, USACE Jacksonville District
- > Planning Division Environmental Coastal Section
- > 701 San Marco
- > Jacksonville, FL 32207
- > 904-232-3607
- >
- >
- >
- > Classification: UNCLASSIFIED
- > Caveats: NONE
- >
- >

**Endangered Species Act - Section 7 Consultation
Biological Opinion**

Action Agency: United States Army Corps of Engineers (COE)

Activity Dredging of Gulf of Mexico Navigation Channels and Sand Mining
("Borrow") Areas Using Hopper Dredges by COE Galveston, New
Orleans, Mobile, and Jacksonville Districts (Consultation Number
F/SER/2000/01287)

Consulting Agency: National Oceanic and Atmospheric Administration, National Marine
Fisheries Service, Southeast Regional Office, Protected Resources
Division, St. Petersburg, Florida

Approved by: 
Roy E. Crabtree, Ph.D., Regional Administrator
NOAA Fisheries, Southeast Regional Office
St. Petersburg, Florida

Date Issued: NOV 19 2003

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Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. § 1531 *et seq.*), requires that each Federal agency shall ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of such species. When the action of a Federal agency may affect a protected species, that agency is required to consult with either the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) or the U.S. Fish and Wildlife Service (FWS), depending upon the protected species that may be affected.

A protected species take shall normally be charged to the District which issues the regulatory permit for the hopper dredging. Civil works projects do not require regulatory permitting therefore civil works hopper dredging takes shall be charged to the COE District conducting or contracting the dredging project.

However, in Florida, the Mobile District will assume responsibility for (and be charged with) all takes of threatened or endangered species resulting from hopper dredging or relocation trawling activities contracted by the Mobile District even though regulatory permits for the activities may be issued by the Jacksonville District, based on a working agreement to this effect developed between the Mobile and Jacksonville Districts (Susan Rees, pers. comm. to Eric Hawk, October 30, 2003).

For example: The Jacksonville District authorizes (via regulatory permit action through a branch office of its Regulatory Division) the restoration of Pensacola Beach utilizing a hopper dredge. The Jacksonville District's Florida West Coast anticipated incidental take level ("quota") shall be charged with any takes ensuing from the hopper dredge activities even though Pensacola Beach geographically lies within the Mobile District's civil works boundaries, since the Jacksonville District has the authority to incorporate permit conditions to limit protected species take, and contracts the work.

For example: The Mobile District typically acts as construction agent for the U.S. Navy to hopper dredge the navigation channel at the Pensacola Naval Air Station ("Navy channel"), a non-civil works "regulatory" project subject to permitting by the Jacksonville District's Regulatory Division (which has regulatory permitting authority for projects in the Florida Panhandle). The Mobile District, acting for the Navy, applies for and obtains the required regulatory permit from Jacksonville District's Regulatory Division. However, the Mobile District, pursuant to the working agreement in place between the Mobile and Jacksonville Districts, shall be charged for any takes ensuing from that hopper dredging activity.

9.0 Reasonable and Prudent Measures

Regulations (50 CFR 402.02) implementing section 7 of the ESA define reasonable and prudent measures as actions the Director believes necessary or appropriate to minimize the impacts, i.e., amount or extent, of incidental take. The reasonable and prudent measures that NOAA Fisheries believes are necessary to minimize the impacts of hopper dredging in the Gulf of Mexico have been discussed with the COE and include use of temporal dredging windows, intake and overflow screening, use of sea turtle deflector dragheads, observer and reporting requirements, and sea turtle relocation trawling. The following reasonable and prudent measures and associated terms and conditions are established to implement these measures, and to document incidental takes. Only incidental takes that occur while these measures are in full implementation are authorized. These restrictions remain valid until reinitiation and conclusion of any subsequent section 7 consultation.

Seasonal Dredging Windows, Observer Requirements, Deflector Dragheads, and Relocation Trawling⁵

⁵The COE Wilmington District's sidecast dredges FRY, MERRITT, and SCHWEIZER, and split-hull hopper dredge CURRITUCK, are exempt from the above hopper dredging requirements (operating windows, deflectors, screening, observers, reporting requirements, etc.). Their small size and operating characteristics including small draghead sizes [2-ft by 2-ft, to 2-ft by 3-ft], small draghead openings [5-in by 5-in to 5 in by 8 in], small suction intake pipe diameters [10-14 in], and limited draghead suction [350-

Experience has shown that injuries sustained by sea turtles entrained in the hopper dredge dragheads are usually fatal. Current regional opinions for hopper dredging require seasonal dredging windows and observer monitoring requirements, deflector dragheads, and conditions and guidelines for relocation trawling, which NOAA Fisheries' believes are necessary to minimize effects of these removals on listed sea turtle species that occur in inshore and nearshore Gulf and South Atlantic waters.

Temperature- and date-based dredging windows:

Both the Mobile and Jacksonville Districts expressed comments opposing NOAA Fisheries' imposition of seasonal dredging windows in their respective Gulf of Mexico dredging areas. In their November 28, 2000, BA on their Florida west coast hopper dredging activities, the Jacksonville District indicated that sea turtles are present year-round in the Gulf, so windows would only be of limited effectiveness. In their October 30, 2002, comments to NOAA Fisheries, the Mobile District noted it did not want to be restricted to seasonal hopper dredging windows, indicating that these would potentially seriously and detrimentally impact its ability to complete its operations and maintain Federal navigation projects due to "no excess of large dredges of the type required to perform maintenance of most Federal projects" and other reasons related to dredging industry capacity, downsizing, "loss of production" associated with the deflector draghead, and safety concerns.

Sea turtles generally move inshore with warming waters and offshore with cooling waters. In East Coast channels, Dickerson et al. (1995) found reduced sea turtle abundance with water temperatures less than 16°C. They found that 1,008 trawls conducted at or below 16°C captured 22 turtles (4.4 per cent), while 1,791 trawls conducted above 16°C resulted in 473 (95.6 percent) captures. Dickerson et al. also found that sea turtles tend to avoid water temperatures less than 15°C; however, hopper dredging Kings Bay, Georgia between March 1-12, 1997 with surface water temperatures of 57-58°F (13.9-14.4°C) resulted in 11 turtle takes in nine days (NMFS 1997).

More recently, the Savannah District COE (COE 2003) reported that the average surface temperature at which recent hopper dredge turtle takes have occurred in Brunswick is 57.7°F (14.3°C) and that "there are scattered takes at lower temperatures than turtles would normally be expected to occur" but that "These lower temperatures may not have played a significant role in those takes." The lowest temperature at which multiple takes have occurred in Brunswick in 2003 is 57°F (13.9°C).

Recognizing the relationship between water temperature and sea turtle presence and based on work by the NOAA Fisheries' Galveston Laboratory (Renaud et al. 1994, 1995) funded by the COE, NOAA Fisheries wrote in its September 22, 1995 RBO to the Galveston and New Orleans Districts that sea turtles might be taken by hopper dredges "in all ship channels in the northern Gulf when temperatures exceed 12°C," and that "Lacking seasonal water temperature data, NMFS believes takes may occur from April through November northeast of Corpus Christi, Texas." Consequently, Term and Condition No. 3 of the 1995 RBO required that observers be aboard hopper dredges year-round from Corpus Christi southwest to the Mexican border, but "If no turtle take is observed in December, then observer coverage can be terminated during January and February or until water temperatures again reach 12°." It also required that "In channels

400 hp]) have been previously determined by NOAA Fisheries to not adversely affect listed species (March 9, 1999, ESA consultation with COE Wilmington District, incorporated herein by reference). The aforementioned vessels and commercial hopper and sidecast dredges of the same or lesser sizes and operating characteristics working in the Gulf of Mexico would be considered similarly exempt by NOAA Fisheries' SERO after consultation with SERO.

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GIWW - LONGBOAT PASS ENVIRONMENTAL ASSESSMENT

APPENDIX F

**PRE-CONSTRUCTION
SEAGRASS SURVEY REPORT**

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**PRE-CONSTRUCTION SEAGRASS SURVEY FOR
OPERATIONS AND MAINTENANCE DREDGING OF
THE GULF INTRACOASTAL WATERWAY,
INCLUDING LONGBOAT, ANNA MARIA,
AND SUNSHINE SKYWAY PASSES**

FINAL REPORT

DECEMBER 2010

Prepared for:
Jacksonville District
U.S. Army Corps of Engineers
701 San Marco Drive
Jacksonville, Florida 32207

Prepared by:
Dial Cordy and Associates Inc.
490 Osceola Avenue
Jacksonville, FL 32250

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1.0 INTRODUCTION

Dial Cordy and Associates Inc. was contracted by Gulf Engineers and Consultants Inc. on behalf of the Jacksonville District, United States Army Corps of Engineers (USACE) to conduct pre-construction seagrass and hardbottom surveys associated with operations and maintenance dredging of the Gulf Intracoastal Waterway (GIWW), including Longboat, Anna Maria and the Sunshine Skyway passes (Figure 1). The proposed project involves maintenance dredging to remove material that has accumulated within the GIWW and associated passes. Longboat Pass is geographically positioned in Manatee County, approximately four miles north of the Sarasota County line, which bisects Longboat Key (Figure 1). Anna Maria Island is to the north and Longboat Key is to the south of the pass. The Sunshine Skyway pass is at the mouth of Tampa Bay in the vicinity of the Sunshine Skyway bridge.

The GIWW from Caloosahatchee River to Anclote River (Florida) was authorized at 100-feet-wide by 9-feet-deep by H. Doc. 371/76/1 on 2 March 1945, and Longboat Pass (Florida) was authorized in a Detailed Project Report (April 1976) on 14 July 1960 (approved by the Chief of Engineers 20 April 1976, under Section 107 of 1960 Rivers and Harbors Act) at 12-feet-deep by 150-feet-wide from the Gulf of Mexico to Longboat Pass Bridge; thence, 10-feet-deep by 100-feet-wide to and along the GIWW to the Cortez Bridge (which divides Anna Maria Sound from Sarasota Bay).

To restore authorized channel depths, several segments within the GIWW between the Caloosahatchee River and Anclote River, as well as Cuts 2 and 3 of the Sunshine Skyway area and Cuts 2 and 3 within the vicinity of Longboat Pass are proposed to be dredged. Proposed dredging areas suspected of containing aquatic resources have been selected for this survey (Figure 1).

Beach quality sand secured from the dredging event would be placed along the shoreline of Longboat Key, approximately 7,600 feet south of Longboat Pass, between Florida Department of Environmental Protection (FDEP) Monuments R-44 and R-51 (Figure 1).

The purpose of the pre-construction marine resource surveys, detailed below, was to delineate and map seagrasses or hardbottom that occur within the proposed project area that could be affected during the proposed maintenance dredging of the GIWW, or during shoreline placement of dredged material, operation of equipment, movements of dredging vessels, placement of anchors, or during turbidity-producing events.



Legend

 Longboat Pass / GIWW Survey Area



0 1 2 4 6 Miles

Location of Survey Areas

Seagrass Survey for Operations and Maintenance
Dredging of Longboat Pass / Gulf Intracoastal Waterway

Scale: 1 inch = 2 miles

Drawn By: MR

Date: November 2010

Approved By: SD

DIAL CORDY
AND ASSOCIATES INC
Environmental Consultants

J10-1176

Figure 1

2.0 PREVIOUS SURVEYS AND RELATED ENVIRONMENTAL DOCUMENTS

The most recent seagrass survey within the project area was performed by Dial Cordy (2009), which included Cut M-5 to the northern limit of Cut M-7, and Cuts 1, 2, and 3 of Longboat Pass. In total, 109 diver transects were performed perpendicular to the channels. Resource maps and estimates of potential impacts to seagrass beds from dredging were summarized in the report. Hardbottom habitat was identified north and south of Longboat Pass. Exposed rock was also identified adjacent to the GIWW channel between Cut M-5 - Transect 16 and M-5 – Transect 18, east of Jewfish Key.

In 1995, the USACE described communities of limestone, rock/rubble, limestone/sponge, limestone/sand, and soft corals occurring north of Longboat Pass (USACE 1995). USACE (1984) was referenced to state that approximately 20.9 acres of “scattered rock hardbottom” were located near FDEP monument R-36 and between monuments R-39 and R-41. “Rock hardbottom” was noted to comprise 14.8 acres between R-35 and R-39. Finally, a total of approximately 74 acres of “scattered rock hardbottom” and “rock hardbottom” were located between monuments R-27 and R-30. No hardbottom formations were identified in these documents south of Longboat Pass.

Data collected from surveys performed by Coastal Planning and Engineering (for Town of Longboat Key, Florida, 2005/06 Beach Renourishment Project, Second Post-Construction Hardbottom Monitoring and Mitigation Report, FDEP Permit No. 0202209-001-JC) did, contrary to older USACE documents (USACE 1984, 1995), show that hardbottom formations were present south of Longboat Pass. These formations were generally located southeast of FDEP monument R-49, and many of the features were located within 1000 feet of shore. It is possible that these features were not visible or detectable a decade or two earlier at the time surveys were completed for the USACE (1984 and 1995). These areas were also observed during the Dial Cordy (2009) survey south of Longboat Pass.

3.0 TECHNICAL APPROACH

3.1 Overview

Marine resource surveys for upcoming operations and maintenance (O&M) dredging activities were conducted from 23 – 28 September 2010. In general, surveys involved diver inspections of the authorized navigation channels within Cuts M-5, M-12, and M-14 (Longboat and Anna Maria); Cuts 1, 2, and 3 in Longboat Pass; and Cuts SC -2 and SC-3 of the Sunshine Passes: the pipeline corridor, the dredging anchorage zones (extending 100 feet outside of the channel) adjacent to those channels; and the candidate renourishment area south of the pass (Table 1, Figure 1). Surveys included 150 transects perpendicular to the channel (comprising 38 transects for Cuts C-2 and C-3; 84 transects for Cuts M-5, M-12, and M-14; and 28 transects for SC-2 and 3) for seagrass surveys; and 28 towed video transects perpendicular to the shore for the hardbottom survey south of Longboat Key (Figures 2-8). Longboat Pass Cut 1 and the Pipeline Corridor were surveyed using a towed diver along meandering transects. Seagrass survey transects were spaced approximately 150 feet apart, and hardbottom video transects were surveyed every 100 feet. Small seagrass polygons located between transects were surveyed for mapping purposes and general quantitative data collected.

Table 1. Summary of segments included in the 2010 seagrass survey .

Name of Segment	Station	Linear Footage	Width of Corridor (feet)
GIWW (Anna Maria, Longboat)			
M-5	0+00 - 79+35	7935	300
M-12	20+00 - 45+00	2500	300
M-14	0+00 - 20+00	2000	300
Sunshine Skyway			
SC-2	10+00 - 30+00	2000	300
SC-3	20+00 - 40+00	2000	300
Longboat Pass			
LB Cut 2	15+50 + 20+50	500	300
LB Cut 3	0+00 - 20+00	2000	300
Pipeline Corridor	20+00 - 37+00	1700	120



Legend

-  Survey Transect
 -  Longboat Pass / GIWW Survey Area
- 0 125 250 500 750 Meters



GIWW M-5 Survey Transect Locations	
Seagrass Survey for Operations and Maintenance Dredging of Longboat Pass / Gulf Intracoastal Waterway	
Scale: 1 inch = 250 meters	Drawn By: MR
Date: November 2010	Approved By: SD
	J10-1176
	Figure 2



Legend

— Survey Transect

▭ Longboat Pass / GIWW Survey Area



Longboat Pass LB-2 and LB-3 Survey Transect Locations

Seagrass Survey for Operations and Maintenance Dredging of Longboat Pass / Gulf Intracoastal Waterway

Scale: 1 inch = 250 meters

Drawn By: MR

Date: November 2010

Approved By: SD



J10-1176

Figure 3

M-13
M-12



Legend

— Survey Transect

□ Longboat Pass / GIWW Survey Area

0 50 100 200 300 Meters



GIWW M-12 Survey Transect Locations	
Seagrass Survey for Operations and Maintenance Dredging of Longboat Pass / Gulf Intracoastal Waterway	
Scale: 1 inch = 100 meters	Drawn By: MR
Date: November 2010	Approved By: SD
 DIAL CORDY AND ASSOCIATES INC. <i>Environmental Consultants</i>	J10-1176
	Figure 4



Legend

— Survey Transect

□ Longboat Pass / GIWW Survey Area



GIWW M-14 Survey Transect Locations	
Seagrass Survey for Operations and Maintenance Dredging of Longboat Pass / Gulf Intracoastal Waterway	
Scale: 1 inch = 100 meters	Drawn By: MR
Date: November 2010	Approved By: SD
 DIAL CORDY AND ASSOCIATES INC <i>Environmental Consultants</i>	J10-1176
	Figure 5



GIWW CUT SC-2

Legend

— Survey Transect

□ Longboat Pass / GIWW Survey Area



GIWW SC-2 Survey Transect Locations	
Seagrass Survey for Operations and Maintenance Dredging of Longboat Pass / Gulf Intracoastal Waterway	
Scale: 1 inch = 100 meters	Drawn By: MR
Date: November 2010	Approved By: SD
	J10-1176
	Figure 6



Legend

— Survey Transect

□ Longboat Pass / GIWW Survey Area



GIWW SC-3 Survey Transect Locations	
Seagrass Survey for Operations and Maintenance Dredging of Longboat Pass / Gulf Intracoastal Waterway	
Scale: 1 inch = 100 meters	Drawn By: MR
Date: November 2010	Approved By: SD
	J10-1176
	Figure 7



Legend

-  FDEP Monument
 -  Towed Video Trackline
 -  Longboat Pass / GIWW Survey Area
- 0 125 250 500 750 Meters



Beach Placement Area Towed Video Tracklines	
Seagrass Survey for Operations and Maintenance Dredging of Longboat Pass / Gulf Intracoastal Waterway	
Scale: 1 inch = 250 meters	Drawn By: MR
Date: November 2010	Approved By: SD
	

3.2 Seagrass Survey and Sampling

Specific methods used by the field team for surveying the location of seagrass habitat and collecting quantitative data, when present, are provided below. In general, divers were deployed along pre-plotted transects for all cuts except for the pipeline corridor. Due to the depth and currents, divers were towed along meandering transects over the length of the pipeline corridor to ascertain presence/absence of seagrass. To aid in determining continuity of the seagrass beds, each area between transects was visually inspected from the surface. Where seagrasses were observed at the initiation point for any transect, divers entered the water to map the seagrass along each transect and to collect quantitative data. For small beds mapped between transects, representative quadrat data was collected within the beds, as well as measurements of the bed taken for mapping purposes.

3.2.1 Field Operations

3.2.1.1 Transects

Seagrass transect lines were surveyed perpendicular to the axis of the channel dredge areas. Transect initiation points (150 ft from channel edge) were created prior to the survey (using ArcGIS 9.2) and were located in the field using HYPACKMAX™ navigational software (Figures 2-7). Transect end-points and diver compass headings were recorded during the survey so that transects could be re-sampled during post-construction monitoring events. Seagrasses along transects were mapped by noting the distance of the edge of seagrass from the transect initiation point (initiation points were 150 feet from one side of the channel to incorporate the “anchor zone.” and channel limits). Divers swam transect lines (marked weighted lines) noting bottom type within a 1-meter wide area centered on each transect line.

3.2.1.2 Point-Sampling

At several points along transects, point-quadrat samples were used to facilitate qualitative descriptions of bottom type, quantitatively assess percent-cover of seagrass, and to determine species composition within the vegetated areas. Within the seagrass sampling area, quadrat sample locations were positioned every 5 meters along planned transects where seagrass was present. Quadrats were one-meter by one-meter and sub-divided into 100 10x10 cm subplots (to allow for counting subplots containing seagrass out of the 100). Differentially corrected GPS (dGPS) positions for each of these quadrats were recorded in the field. Percent-cover was visually estimated for all seagrass species occurring in each quadrat, and a score based on the cover of the species in that quadrat was assigned according to the Braun-Blanquet (1965) abundance scale (Table 2).

Table 2. Braun-Blanquet abundance scores.

0	Species absent from quadrat
0.1	Species represented by a solitary short shoot, <5% cover
0.5	Species represented by a few (< 5%) short shoots, <5% cover
1.0	Species represented by many (> 5%) short shoots, <5% cover
2.0	Species represented by many (> 5%) short shoots 5% - 25% cover
3.0	Species represented by many (> 5%) short shoots 25%- 50% cover
4.0	Species represented by many (> 5%) short shoots 50%- 75% cover
5.0	Species represented by many (> 5%) short shoots 75%-100% cover

3.2.2 Seagrass Habitat Maps and Data

Seagrass polygons were developed by using transect data to estimate coverage among transects, in ArcGIS 9.2. The perimeters of all seagrass beds within the channel and construction “anchor zone” were delineated over an aerial imaging base. The seagrass maps were prepared to illustrate coverage according to species composition. The area of cover and abundance data for each species assemblage type was quantified and tabulated with reference to location.

3.3 Hardbottom Surveys

3.3.2 Surface-based

To identify, delineate and map hardbottom habitat located in the nearshore area seaward of the beach disposal area south of Longboat Pass (Figure 8), an integrated video mapping system developed specifically for this application was used. The system included a towed video camera (Deepsea Power and Light/LED Multi Seacam 2065 Low light) used in conjunction with a DGPS and HYPACKMAX™ navigation software. The video camera was placed to the bottom of the seafloor and when the towing vessel was propelled forward, the camera was pulled through the water column in a forward facing direction, so that the benthos was visible on the bottom of the screen. During the survey, the camera was used to remotely locate resources, which were more carefully studied by divers. While conducting shore-parallel transects in search for hardbottom and other habitats, the real-time position of the camera was overlaid on the digitally recorded survey record (Everfocus Digital Recorder) along with the survey date and time. The point at which each video transect crossed a change in marine habitat (i.e., hardbottom) was determined from post-processing of the video record. The points were then incorporated into a database and ArcGIS 9.2 was used to generate resource maps.

3.3.3 In-water

Several locations along shore-perpendicular transects were surveyed by divers adjacent to the beach disposal area south of the pass to further verify video images. No quantitative data were taken as no hardbottom was located.

4.0 RESULTS

4.1 Overview

Seagrass beds were found along the length of Cut M-5; at limited locations of Longboat Cut 3 and within the pipeline corridor; along the southern half of M-12 and M-14; and at two locations along the northwest side of SC-3 (Figures 9-17). No seagrass were observed within Longboat Cuts 1 and 2, and SC-2 (Figures 12 and 15). Of the total of 150 transects surveyed, seagrass was located within 50 of them for the total project survey area. This does not include seagrass beds mapped between transects. Table 3 provides a summary of the acreage cover of seagrass species found within each project cut and the pipeline corridor. Summary data tables for all collected transect data are provided in Appendix A.

Seagrass species cover types identified in the study area included monospecific beds of manatee grass (*Syringodium filiforme*), turtle grass (*Thalassia testudinum*), and shoal grass

(*Halodule wrightii*); and mixed beds of shoal grass/manatee grass, shoal grass/turtle grass, manatee grass/turtle grass, and mixed beds comprised of all three species. Several areas of exposed rock/outcrops and unvegetated bottom with scattered rocks were also identified during seagrass surveys east of Jewfish Key, along the east and west channel edge (Figure 10). No hardbottom habitat was found along 28 towed video transects surveyed in the nearshore area of Longboat Key, only a relict seawall.

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PI STA. 0+00 CU
 STA. 79+35.40 CU

GIWW CUT M-5

Legend

Longboat Pass / GIWW Survey Area

Resource Delineation (Sept10)

- Halodule wrightii
- Syringodium filiforme
- Thalassia testudinum
- H. wrightii / S. filiforme
- H. wrightii / T. testudinum
- S. filiforme / T. testudinum
- H. wrightii / S. filiforme / T. testudinum
- Exposed Rock Ledge

Non-vegetated, predominantly sandy bottom



Matchline Figure 9

Matchline Figure 10

GIWW Cut M-5 Resource Delineation - North

Seagrass Survey for Operations and Maintenance
 Dredging of Longboat Pass / Gulf Intracoastal Waterway

Scale: 1 inch = 100 meters

Drawn By: MR

Date: November 2010

Approved By: SD



J10-1176

Figure 9

Matchline Figure 9

Matchline Figure 10

Pipeline Corridor

GIWW CUT M-5

Matchline Figure 10

Matchline Figure 11

Legend

Longboat Pass / GIWW Survey Area

Resource Delineation (Sept10)

- Halodule wrightii
- Syringodium filiforme
- Thalassia testudinum
- H. wrightii / S. filiforme
- H. wrightii / T. testudinum
- S. filiforme / T. testudinum
- H. wrightii / S. filiforme / T. testudinum
- Exposed Rock Ledge

Non-vegetated, predominantly sandy bottom



GIWW Cut M-5 Resource Delineation - Central

Seagrass Survey for Operations and Maintenance Dredging of Longboat Pass / Gulf Intracoastal Waterway

Scale: 1 inch = 100 meters

Drawn By: MR

Date: November 2010

Approved By: SD



J10-1176

Figure 10

Matchline Figure 10

Matchline Figure 11

GIWW CUT M-5

T M-5

CUT M-4

Legend

Longboat Pass / GIWW Survey Area

Resource Delineation (Sept10)

- Halodule wrightii
- Syringodium filiforme
- Thalassia testudinum
- H. wrightii / S. filiforme
- H. wrightii / T. testudinum
- S. filiforme / T. testudinum
- H. wrightii / S. filiforme / T. testudinum
- Exposed Rock Ledge

Non-vegetated, predominantly sandy bottom



GIWW Cut M-5 Resource Delineation - South

Seagrass Survey for Operations and Maintenance
Dredging of Longboat Pass / Gulf Intracoastal Waterway

Scale: 1 inch = 100 meters

Drawn By: MR

Date: November 2010

Approved By: SD

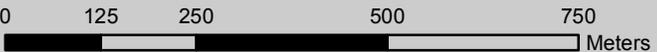


J10-1176

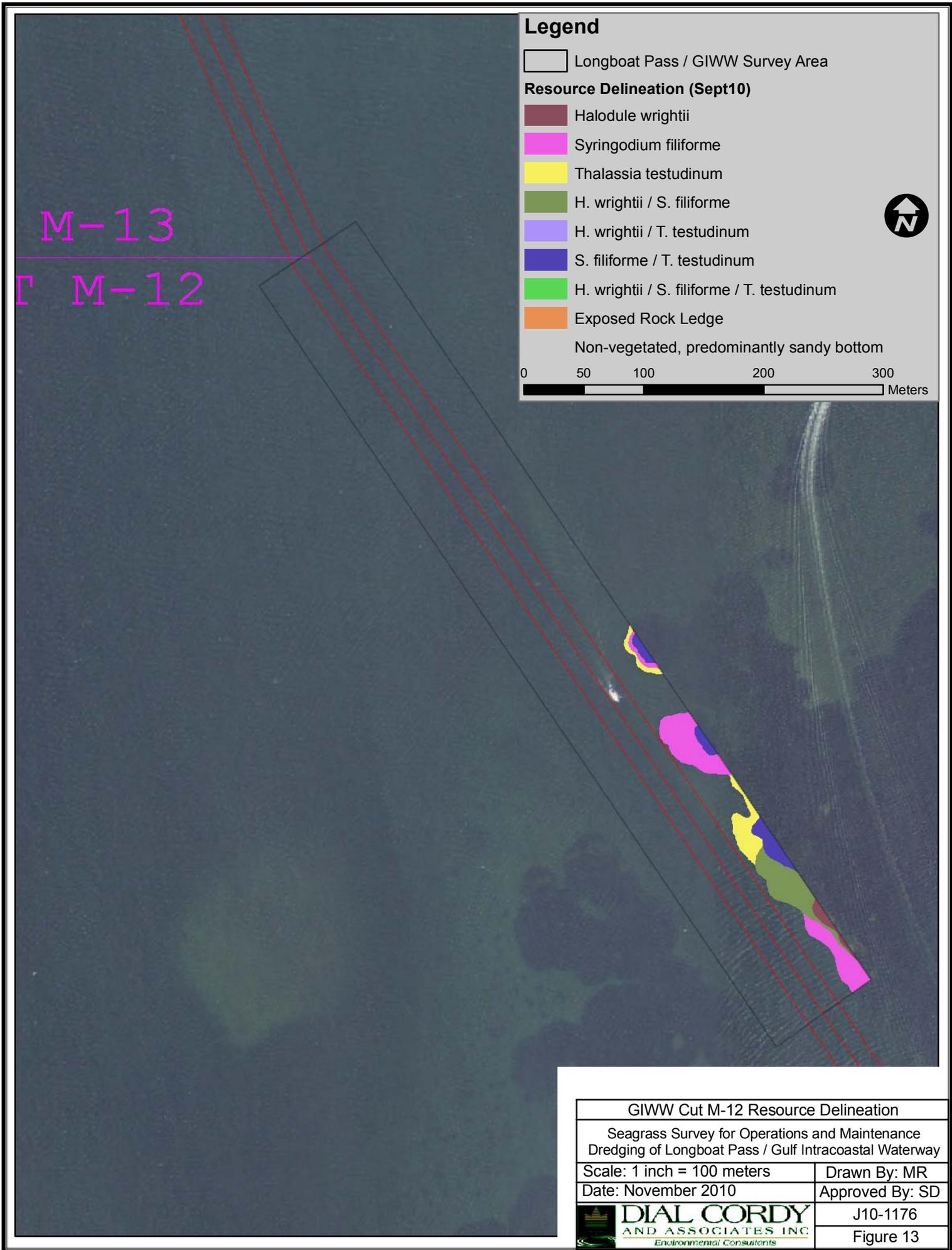
Figure 11

Legend

- Longboat Pass / GIWW Survey Area
- Resource Delineation (Sept10)**
- Halodule wrightii
- Syringodium filiforme
- Thalassia testudinum
- H. wrightii / S. filiforme
- H. wrightii / T. testudinum
- S. filiforme / T. testudinum
- H. wrightii / S. filiforme / T. testudinum
- Exposed Rock Ledge
- Non-vegetated, predominantly sandy bottom



Longboat Pass Cut 1, 2 and 3 Resource Delineation	
Seagrass Survey for Operations and Maintenance Dredging of Longboat Pass / Gulf Intracoastal Waterway	
Scale: 1 inch = 250 meters	Drawn By: MR
Date: November 2010	Approved By: SD
 DIAL CORDY AND ASSOCIATES INC. Environmental Consultants	J10-1176
	Figure 12



Legend

□ Longboat Pass / GIWW Survey Area

Resource Delineation (Sept10)

- Halodule wrightii
- Syringodium filiforme
- Thalassia testudinum
- H. wrightii / S. filiforme
- H. wrightii / T. testudinum
- S. filiforme / T. testudinum
- H. wrightii / S. filiforme / T. testudinum
- Exposed Rock Ledge
- Non-vegetated, predominantly sandy bottom



0 50 100 200 300 Meters

GIWW Cut M-12 Resource Delineation

Seagrass Survey for Operations and Maintenance
Dredging of Longboat Pass / Gulf Intracoastal Waterway

Scale: 1 inch = 100 meters

Drawn By: MR

Date: November 2010

Approved By: SD

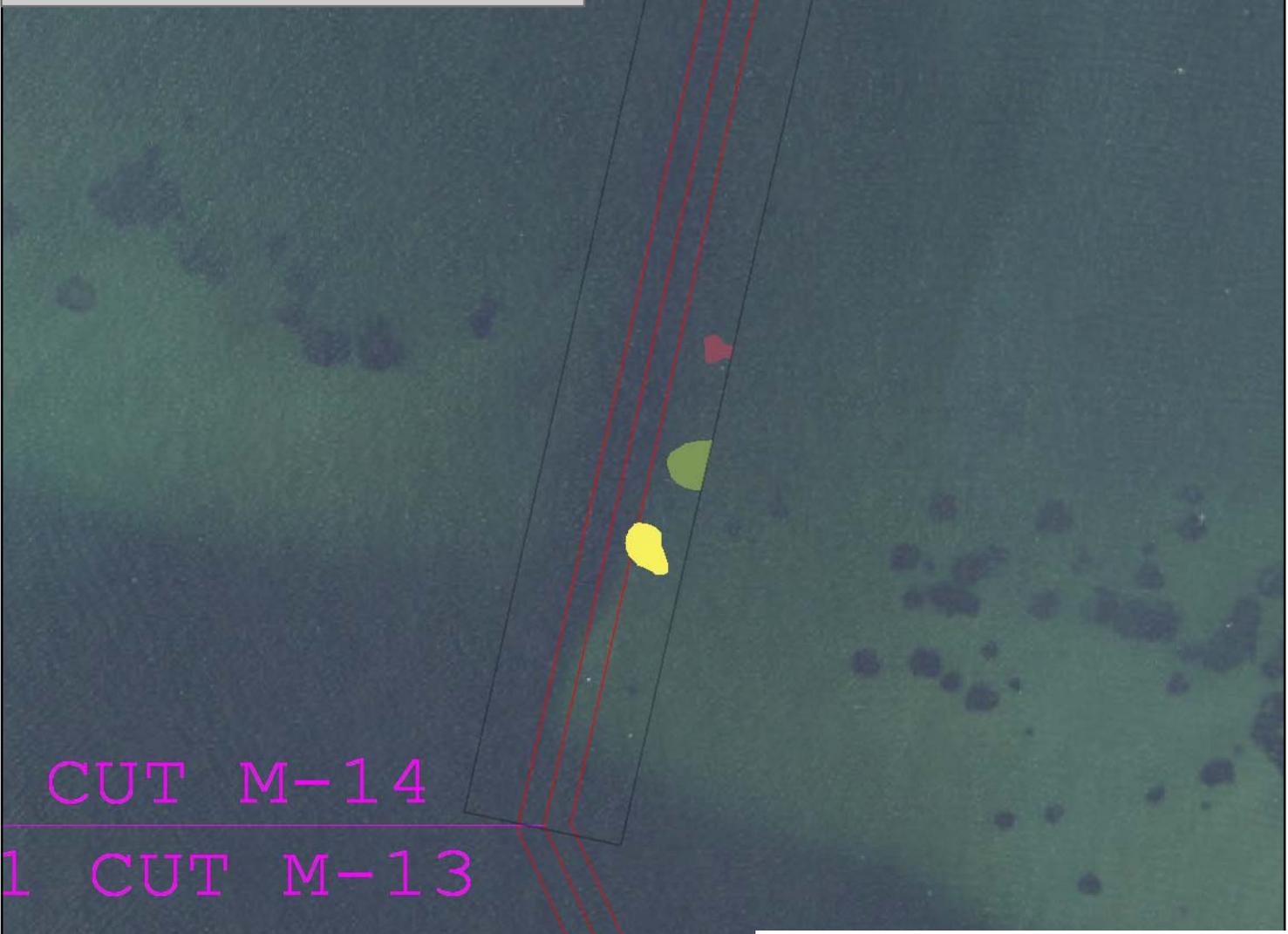


J10-1176

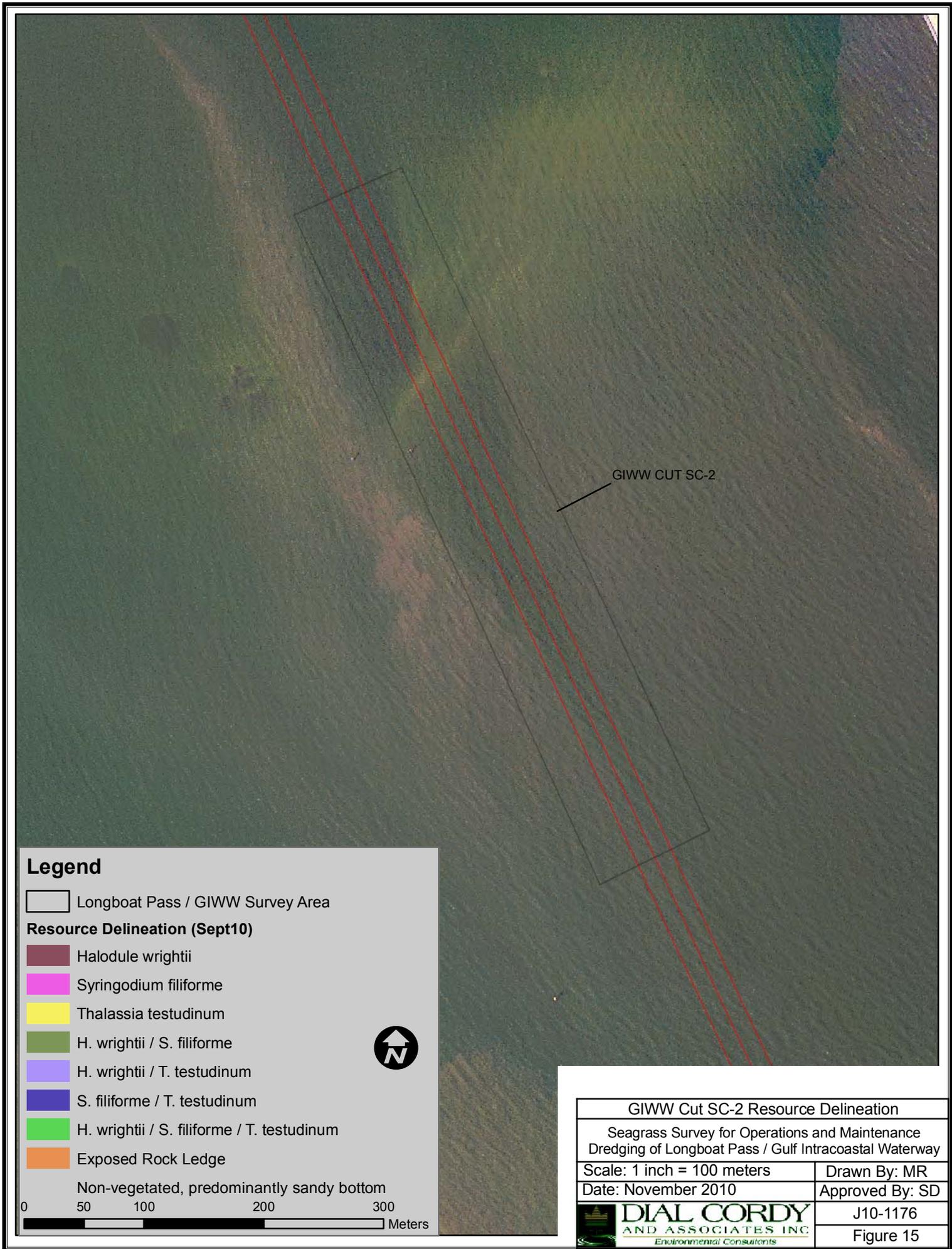
Figure 13

Legend

- Longboat Pass / GIWW Survey Area
- Resource Delineation (Sept10)**
- Halodule wrightii
- Syringodium filiforme
- Thalassia testudinum
- H. wrightii / S. filiforme
- H. wrightii / T. testudinum
- S. filiforme / T. testudinum
- H. wrightii / S. filiforme / T. testudinum
- Exposed Rock Ledge
- Non-vegetated, predominantly sandy bottom



GIWW Cut M-14 Resource Delineation	
Seagrass Survey for Operations and Maintenance Dredging of Longboat Pass / Gulf Intracoastal Waterway	
Scale: 1 inch = 100 meters	Drawn By: MR
Date: November 2010	Approved By: SD
 DIAL CORDY AND ASSOCIATES INC <i>Environmental Consultants</i>	J10-1176
	Figure 14



Legend

 Longboat Pass / GIWW Survey Area

Resource Delineation (Sept10)

-  Halodule wrightii
-  Syringodium filiforme
-  Thalassia testudinum
-  H. wrightii / S. filiforme
-  H. wrightii / T. testudinum
-  S. filiforme / T. testudinum
-  H. wrightii / S. filiforme / T. testudinum
-  Exposed Rock Ledge



Non-vegetated, predominantly sandy bottom



GIWW CUT SC-2

GIWW Cut SC-2 Resource Delineation	
Seagrass Survey for Operations and Maintenance Dredging of Longboat Pass / Gulf Intracoastal Waterway	
Scale: 1 inch = 100 meters	Drawn By: MR
Date: November 2010	Approved By: SD
 DIAL CORDY AND ASSOCIATES INC <i>Environmental Consultants</i>	J10-1176
	Figure 15



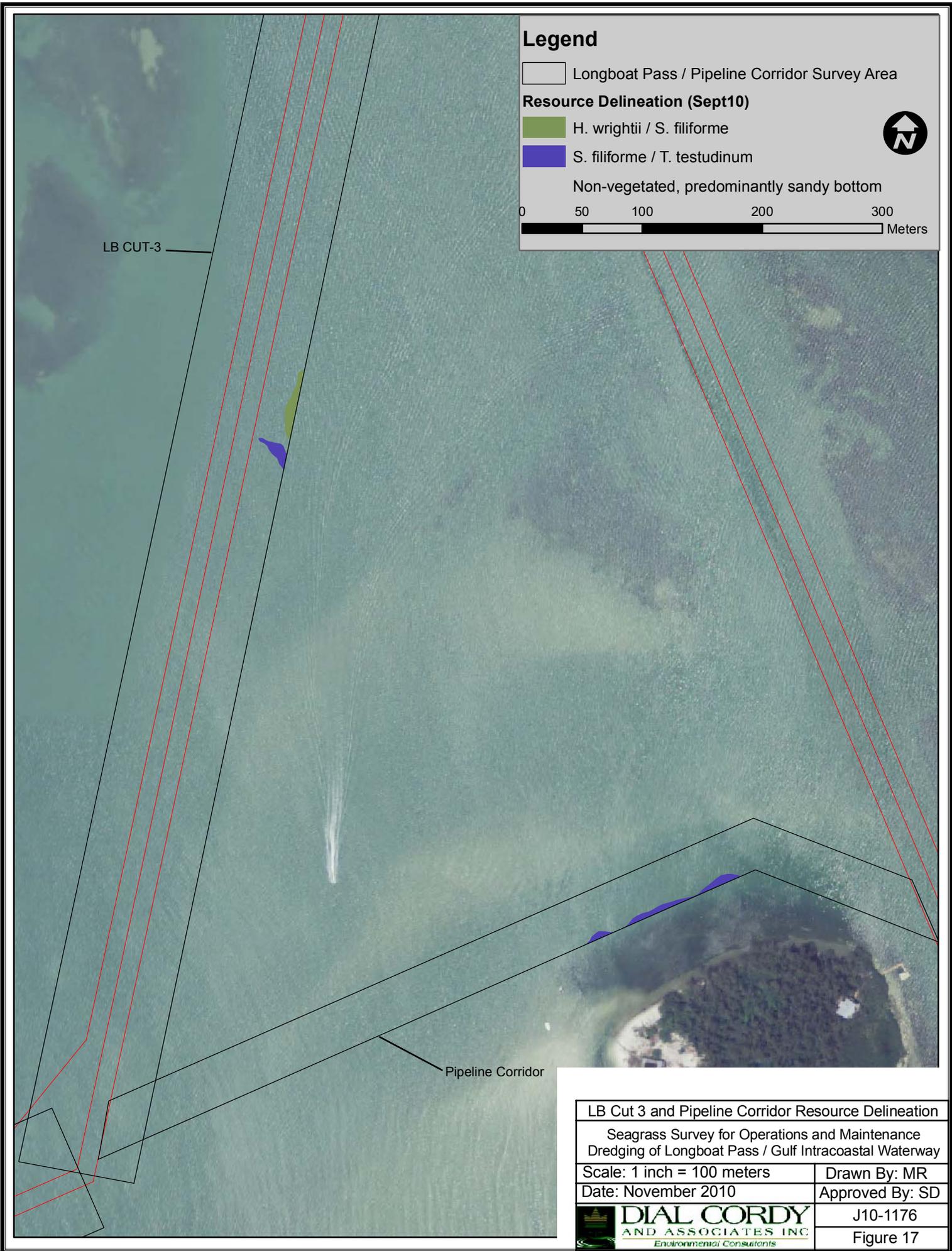
GIWW CUT SC-3

Legend

- Longboat Pass / GIWW Survey Area
- Resource Delineation (Sept10)**
- Halodule wrightii
- Syringodium filiforme
- Thalassia testudinum
- H. wrightii / S. filiforme
- H. wrightii / T. testudinum
- S. filiforme / T. testudinum
- H. wrightii / S. filiforme / T. testudinum
- Exposed Rock Ledge
- Non-vegetated, predominantly sandy bottom



GIWW Cut SC-3 Resource Delineation	
Seagrass Survey for Operations and Maintenance Dredging of Longboat Pass / Gulf Intracoastal Waterway	
Scale: 1 inch = 100 meters	Drawn By: MR
Date: November 2010	Approved By: SD
 DIAL CORDY AND ASSOCIATES INC <i>Environmental Consultants</i>	J10-1176
	Figure 16



Legend

□ Longboat Pass / Pipeline Corridor Survey Area

Resource Delineation (Sept10)

■ H. wrightii / S. filiforme

■ S. filiforme / T. testudinum

Non-vegetated, predominantly sandy bottom



LB CUT-3

Pipeline Corridor

LB Cut 3 and Pipeline Corridor Resource Delineation	
Seagrass Survey for Operations and Maintenance Dredging of Longboat Pass / Gulf Intracoastal Waterway	
Scale: 1 inch = 100 meters	Drawn By: MR
Date: November 2010	Approved By: SD
	J10-1176
	Figure 17

Table 3. Habitat types and area coverage within the GIWW study area.

Location	Community	Area (ac)	
GIWW M-5	<i>H. wrightii</i>	3.442	
	<i>H. wrightii</i> / <i>S. filiforme</i>	0.374	
	<i>H. wrightii</i> / <i>S. filiforme</i> / <i>T. testudinum</i>	0.034	
	<i>H. wrightii</i> / <i>T. testudinum</i>	1.480	
	<i>S. filiforme</i>	4.432	
	<i>S. filiforme</i> / <i>T. testudinum</i>	4.825	
	<i>T. testudinum</i>	0.421	
	Exposed rock ledge	0.153	
LB CUT-2	Unvegetated, sandy substrate		
LB CUT-3	<i>H. wrightii</i> / <i>S. filiforme</i>	0.089	
	<i>S. filiforme</i> / <i>T. testudinum</i>	0.055	
Pipeline Corridor	<i>H. wrightii</i>	0.000	(8.529 ft ²)
	<i>S. filiforme</i> / <i>T. testudinum</i>	0.115	
GIWW M-12	<i>Halodule wrightii</i>	0.059	
	<i>H. wrightii</i> / <i>Syringodium filiforme</i>	0.354	
	<i>S. filiforme</i>	0.641	
	<i>S. filiforme</i> / <i>Thalassia testudinum</i>	0.216	
	<i>T. testudinum</i>	0.245	
GIWW M-14	<i>H. wrightii</i>	0.052	
	<i>H. wrightii</i> / <i>S. filiforme</i>	0.145	
	<i>T. testudinum</i>	0.140	
GIWW SC-2	Unvegetated, sandy substrate		
GIWW SC-3	<i>S. filiforme</i>	0.063	

4.2 Seagrass Distribution, Occurrence, and Abundance

4.2.1 General Distribution and Occurrence

The distribution and occurrence of seagrass species cover types within each Cut or study area are described below.

Cut M-5

All monospecific and mixed seagrass species beds described above were found within M-5 (Figures 9-11). Of the species cover types present, monospecific and mixed beds of *S. filiforme* and *T. testudinum* were the most abundant; covering a total area of 9.78 acres; while *H. wrightii* species cover types covered an area of 5.33 total acres (Table 3). A majority of the seagrass observed in this cut occurred east of Jewfish Key between Transects M-15 and M-37. Both *H. wrightii* (0.125 ac) and *S. filiforme* (0.117 ac) were found with limited cover within the channel between Transect M-15 and M-21 (Appendix A).

Longboat Cut 3

A small mixed bed of *H. wrightii/S. filiforme* and one of *S. filiforme/T. testudinum* were found on the east side of Cut 3, near the middle of the cut (Figure 12), covering an area of 0.09 and 0.06 acres respectively, for the two beds (Table 3). No seagrass was found within the channel.

Cut M-12

Seagrass species cover types found along the east side of the channel between Transects M-12-1 and M-12-8 included monospecific beds of all three species and mixed beds of *H. wrightii/S. filiforme*, and *S. filiforme/T. testudinum* (Figure 13). Seagrass covered a total area of 1.51 acres within this cut; with *S. filiforme*, *T. testudinum*, and mixed beds of both species covering an area of 1.10 acres; and *H. wrightii* and mixed beds of *H. wrightii/S. filiforme* covering 0.41 acres (Table 3). No seagrass was observed within the channel.

Cut M-14

One small bed of *T. testudinum*, *H. wrightii*, and one mixed bed of *H. wrightii/S. filiforme* were observed east of the channel between. A small portion of the *T. testudinum* polygon (0.023 ac) occurred within the channel limits along the slope of the channel (Figure 14). Seagrass covered a total area of 0.34 acres within this cut (Table 3).

Cut SC-3

Seagrass occurrence was limited to two small beds of *S. filiforme*, which are the eastern limits

of larger seagrass beds extending to the west (Figure 16). Seagrass covered an area of 0.06 acres within this cut and none were found within the channel limits (Table 3).

Pipeline Corridor

Seagrass occurrence within the pipeline corridor was limited to the presence of a mixed bed of *S. filiforme*/*T. testudinum* along approximately 100 ft of the southern border of the corridor near Jewfish Key (Figure 17). Seagrass covered an area of 8.25 ft² for *H. wrightii* (not shown on figure due to scale) and 0.12 acres for *S. filiforme*/*T. testudinum* (Table 3).

4.2.2 Abundance and Frequency of Occurrence

Of the 150 transects surveyed along the GIWW, marine seagrass species were observed along 50 transects or 33% of all transects (Tables 4-6). *H. wrightii* occurred at 38 transects or 25% of all transects surveyed, while *S. filiforme* also occurred at 38 transects, or 25% of all transects surveyed. *T. testudinum* occurred at 36 or 24% of all transects. A summary of percent cover, abundance, and density data along each transect where seagrass was found is provided in Tables 4-6. Transect data are included as Appendix A.

4.2.2.1 Abundance

Abundance is expressed as a sum of the cover abundance scores (Braun-Blanquet scores) divided by the number of quadrats where the specific species was assigned a score. Scores range from 0.1 to 5, where 0.1 is a solitary shoot, 0.5 is a few shoots <5%, 1.0 is numerous shoots <5% cover, 2.0 is 5 to 25% cover, 3.0 is 25 to 50%, 4.0 is 50 to 75% cover, and 5.0 is >75% cover.

The range of abundance values for *H. wrightii* ranged from 1.5 to 5.0 at the M-5 transects where *H. wrightii* occurred. Across M-5 transects *H. wrightii* average abundance in the study area was a mean of 3.7. *S. filiforme* abundance values ranged from 2.2 to 5, with a mean of 4.2 across all transects containing *S. filiforme*. *T. testudinum* ranged from 1.3 to 5.0 with a mean of 3.57. The M-12 transects had significantly lower abundance than M-5 with averages for *H. wrightii*, *S. filiforme* and *T. testudinum* being 2.5, 3.5, and 0.5 respectively. M-14 had abundance values of 2.0 for all three species due to the low number of occupied quadrats and consistency of the small beds.

4.2.2.2 Density

Density is expressed as the sum of the cover abundance scores divided by the total quadrats sampled. When compared to abundance values, density values are comparatively low because values are averaged across all quadrats within each transect, rather than only at occupied quadrats.

Density values for transects M-5 for *H. wrightii* ranged from 0.07 to 1.23, with a mean density of 0.49. *S. filiforme* had density values ranging from 0.1 to 2.6 with a mean density value of 1.15. *T. testudinum* had density values ranging from 0.1 to 1.8 with a mean density value of 0.70. M-12 transects had lower density values with averages for *H. wrightii*, *S. filiforme* and *T. testudinum* being 0.2, 0.76 and 0.10 respectively. M-14 values were also low with 0.54, 0.45 and 0.45 for *H. wrightii*, *S. filiforme*, and *T. testudinum* respectively.

Table 4. Seagrass percent cover, abundance, and density values for M-5 transects. September 2010.

Transect	Species	Percent Cover	Abundance	Density
1	<i>S. filiforme</i>	5.56	4.00	0.30
1	<i>T. testudinum</i>	14.89	3.22	0.60
2	<i>S. filiforme</i>	9.40	4.00	0.48
3	<i>S. filiforme</i>	10.56	4.00	0.44
3	<i>T. testudinum</i>	6.67	3.50	0.26
3	<i>H. wrightii</i>	1.85	3.00	0.11
4	<i>H. wrightii</i>	9.78	2.67	0.35
4	<i>T. testudinum</i>	3.70	4.00	0.17
5	<i>H. wrightii</i>	1.09	4.00	0.17
6	<i>H. wrightii</i>	9.52	4.50	0.43
6	<i>S. filiforme</i>	4.76	5.00	0.24
7	<i>H. wrightii</i>	8.75	5.00	0.63
13	<i>H. wrightii</i>	10.56	2.33	0.78
16	<i>T. testudinum</i>	8.65	3.67	0.42
16	<i>S. filiforme</i>	30.19	3.67	1.27
16	<i>H. wrightii</i>	11.65	1.55	0.12
17	<i>T. testudinum</i>	17.20	4.20	0.84
17	<i>S. filiforme</i>	31.60	4.33	1.56
17	<i>H. wrightii</i>	15.40	4.25	0.68
18	<i>T. testudinum</i>	30.00	4.75	1.58
18	<i>S. filiforme</i>	36.17	4.18	1.92
18	<i>H. wrightii</i>	8.33	5.00	0.42
19	<i>T. testudinum</i>	8.08	1.37	0.33
19	<i>S. filiforme</i>	54.80	4.64	2.60
19	<i>H. wrightii</i>	8.00	5.00	0.40
20	<i>T. testudinum</i>	18.85	3.00	0.92
20	<i>S. filiforme</i>	55.58	4.33	2.50
20	<i>H. wrightii</i>	7.69	5.00	0.38
21	<i>T. testudinum</i>	37.41	3.55	1.44
21	<i>S. filiforme</i>	25.56	3.12	1.04
21	<i>H. wrightii</i>	5.00	3.00	0.22
22	<i>T. testudinum</i>	33.33	4.11	1.37
22	<i>S. filiforme</i>	40.74	4.64	1.89
22	<i>H. wrightii</i>	11.48	3.00	0.44
23	<i>T. testudinum</i>	23.20	3.00	0.72

Table 4. (continued).

Transect	Species	Percent Cover	Abundance	Density
23	<i>S. filiforme</i>	39.40	3.82	1.68
23	<i>H. wrightii</i>	16.00	4.50	0.72
24	<i>T. testudinum</i>	22.22	4.50	1.00
24	<i>S. filiforme</i>	18.52	5.00	0.93
24	<i>H. wrightii</i>	30.00	3.44	1.15
25	<i>T. testudinum</i>	28.08	3.50	1.08
25	<i>S. filiforme</i>	29.23	3.56	1.23
25	<i>H. wrightii</i>	27.50	4.00	1.23
26	<i>T. testudinum</i>	11.11	4.67	0.52
26	<i>S. filiforme</i>	44.44	4.75	2.11
26	<i>H. wrightii</i>	14.81	4.80	0.89
27	<i>T. testudinum</i>	41.20	4.18	1.84
27	<i>S. filiforme</i>	38.40	4.00	1.60
27	<i>H. wrightii</i>	12.00	4.33	0.52
28	<i>T. testudinum</i>	26.67	4.38	1.30
28	<i>S. filiforme</i>	29.63	4.50	1.33
28	<i>H. wrightii</i>	18.52	5.00	0.93
29	<i>T. testudinum</i>	17.60	3.80	0.76
29	<i>S. filiforme</i>	42.40	4.27	1.88
29	<i>H. wrightii</i>	16.00	5.00	0.80
30	<i>T. testudinum</i>	6.15	4.00	0.31
30	<i>S. filiforme</i>	27.69	4.50	1.38
30	<i>H. wrightii</i>	19.23	5.00	0.96
31	<i>T. testudinum</i>	13.85	3.50	0.54
31	<i>S. filiforme</i>	33.08	3.50	1.35
31	<i>H. wrightii</i>	11.54	3.75	0.58
32	<i>S. filiforme</i>	23.21	4.57	1.14
32	<i>H. wrightii</i>	10.54	4.67	0.50
33	<i>T. testudinum</i>	16.35	2.68	0.62
33	<i>S. filiforme</i>	19.23	5.00	0.96
33	<i>H. wrightii</i>	15.00	4.25	0.65
34	<i>T. testudinum</i>	10.56	3.50	0.52
34	<i>S. filiforme</i>	14.07	4.50	0.67
34	<i>H. wrightii</i>	10.19	4.00	0.44
36	<i>T. testudinum</i>	4.19	1.07	0.12
36	<i>S. filiforme</i>	5.56	5.00	0.37
36	<i>H. wrightii</i>	11.11	3.67	0.41

Table 4. (concluded).

Transect	Species	Percent Cover	Abundance	Density
37	<i>T. testudinum</i>	19.05	3.60	0.86
37	<i>S. filiforme</i>	15.00	2.22	0.53
37	<i>H. wrightii</i>	9.52	5.00	0.48
38	<i>T. testudinum</i>	17.96	3.80	0.70
38	<i>S. filiforme</i>	25.93	4.29	1.11
38	<i>H. wrightii</i>	6.11	3.50	0.26
41	<i>T. testudinum</i>	8.70	5.00	0.43
41	<i>S. filiforme</i>	8.70	5.00	0.43
41	<i>H. wrightii</i>	5.43	3.00	0.26
42	<i>T. testudinum</i>	12.00	5.00	0.60
42	<i>H. wrightii</i>	6.80	2.55	0.20
43	<i>T. testudinum</i>	8.46	3.67	0.42
43	<i>H. wrightii</i>	10.00	3.00	0.35
44	<i>T. testudinum</i>	2.31	3.00	0.12
45	<i>H. wrightii</i>	2.69	2.05	0.16
46	<i>T. testudinum</i>	1.54	1.33	0.15
46	<i>S. filiforme</i>	7.69	5.00	0.38
46	<i>H. wrightii</i>	1.54	2.00	0.08
47	<i>S. filiforme</i>	2.00	3.00	0.12
47	<i>H. wrightii</i>	2.00	1.50	0.12
48	<i>H. wrightii</i>	6.15	2.25	0.35

Table 5. Seagrass percent cover, abundance, and density values for M-12 transects September 2010.

Transect	Species	Percent Cover	Abundance	Density
1	<i>S. filiforme</i>	31.00	4.31	1.72
2	<i>H. wrightii</i>	7.41	5.00	0.37
2	<i>S. filiforme</i>	5.19	2.82	0.52
2	<i>T. testudinum</i>	0.63	0.10	0.01
3	<i>S. filiforme</i>	33.25	3.73	1.31
3	<i>H. wrightii</i>	3.00	0.10	0.03
4	<i>S. filiforme</i>	10.23	2.28	0.35
4	<i>T. testudinum</i>	18.08	1.51	0.47
5	<i>S. filiforme</i>	7.31	4.00	0.31
5	<i>T. testudinum</i>	6.73	1.37	0.16

Table 5. (concluded).

Transect	Species	Percent Cover	Abundance	Density
6	<i>S. filiforme</i>	30.00	4.43	1.35
6	<i>T. testudinum</i>	0.70	0.10	0.01
7	<i>S. filiforme</i>	3.48	4.00	0.17
7	<i>T. testudinum</i>	0.22	0.10	0.00
8	<i>S. filiforme</i>	11.74	3.00	0.39
8	<i>T. testudinum</i>	0.43	0.10	0.00

Table 6. Seagrass percent cover, abundance, and density values for M-14 transects September 2010.

Transect	Species	Percent Cover	Abundance	Density
5	<i>T. testudinum</i>	1.05	2.00	0.0909
6	<i>H. wrightii</i>	5.27	2.00	0.5455
6	<i>S. filiforme</i>	2.55	2.00	0.4545

Table 7. Seagrass average percent cover, abundance, and density values for all transects September 2010.

Location	Species	Percent Cover	Abundance	Density
M-5	<i>H. wrightii</i>	10.62	3.70	0.49
M-5	<i>S. filiforme</i>	25.14	4.22	1.15
M-5	<i>T. testudinum</i>	16.21	3.57	0.71
M-12	<i>H. wrightii</i>	5.20	2.55	0.20
M-12	<i>S. filiforme</i>	16.52	3.57	0.77
M-12	<i>T. testudinum</i>	4.46	0.55	0.11
M-14	<i>T. testudinum</i>	55.00	2.00	0.40
M-14	<i>H. wrightii</i>	35.00	2.00	0.53
M-14	<i>S. filiforme</i>	45.00	2.00	0.53

4.3 Hardbottom Communities

Twenty-eight shore-perpendicular transects in the nearshore areas south of Longboat Pass between R-042 and R-049 were surveyed to investigate whether hardbottom or other marine habitats were present. The only item found was a submerged relict seawall between R-048 and

R-049 (Figure 18). No natural hardbottom habitat was found. The hardbottom areas reported in 2009 (Dial Cordy 2009) and previously by Coastal Planning and Engineering Inc. (2009) occur south of R-049 and out of the study area for this contract. In addition, exposed rock was observed adjacent to the channel between transects M-5-28 and M-5-31 (Figure 10). These are likely exposed rocks which have been present since the channel was first dredged.

4.4 Seagrass Potentially Effected from Proposed Operations and Maintenance Dredging

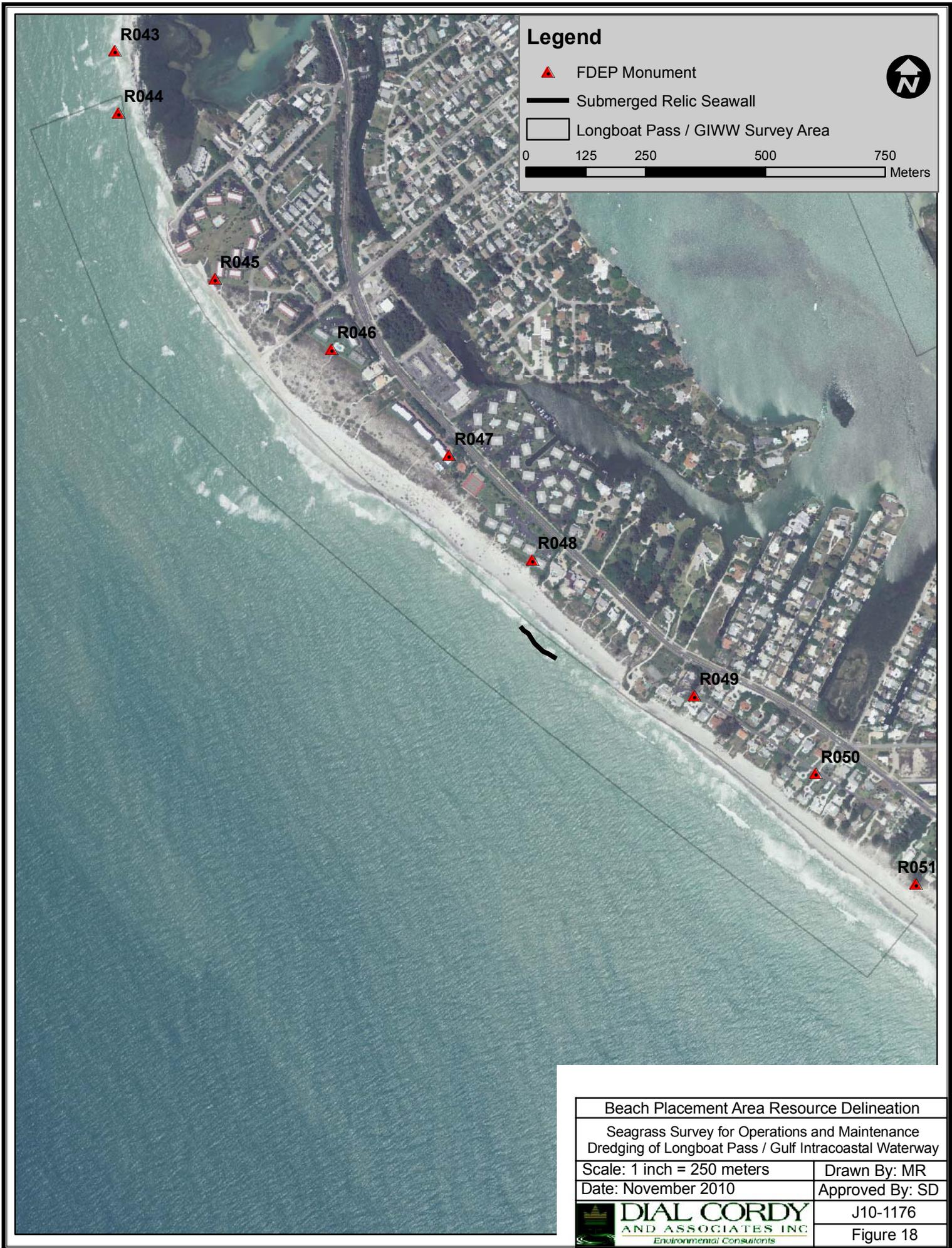
Based on the baseline seagrass survey performed within the study area a total of 0.309 acres may be directly affected as a result of maintenance dredging, excluding potential impacts within the pipeline corridor. Table 8 summarizes the seagrass cover types and acreages effected. Seagrass impacts are limited to Cuts M-5 and M-14. Seagrass located within the proposed pipeline corridor can be avoided if the corridor is realigned or shifted to the north. Given the present width of the corridor, this impact can likely be avoided (Figure 17).

Table 8. Seagrass potentially effected from proposed dredging.

Cover Type	Acreage	Location
<i>Halodule wrightii</i>	0.125 ac	M-5
<i>Syringodium filiforme</i>	0.117 ac	M-5
<i>H. wrightii/S. filiforme</i>	0.044 ac	M-5
<i>Thalassia testudinum</i>	0.023 ac	M-14
<i>H. wrightii</i>	0.040 ac	Pipeline Corridor
<i>S. filiforme/T. testudinum</i>	0.115 ac	Pipeline Corridor

5.0 SUMMARY

Seagrasses in the study area most likely to be subject to impacts from maintenance dredging include monospecific and mixed beds of *T. testudinum*, *H. wrightii*, and *S. filiforme* within Cuts M-5 and M-14, totaling 0.309 acres. This total acreage assumes that seagrass present within the pipeline corridor can be avoided. Within Cut M-5, between Transects 28 and 31, exposed rock/outcrops were observed adjacent to the channel. Depending upon the angle of repose for dredging this cut, it is likely these areas may not be affected as a result of dredging. No natural hardbottom habitat was observed along the 28 towed video transects in the nearshore area of Longboat Key.



Beach Placement Area Resource Delineation	
Seagrass Survey for Operations and Maintenance Dredging of Longboat Pass / Gulf Intracoastal Waterway	
Scale: 1 inch = 250 meters	Drawn By: MR
Date: November 2010	Approved By: SD
J10-1176	
Figure 18	

6.0 REFERENCES

Braun-Blanquet, J. 1965. Plant Sociology: the study of plant communities. Hafner Publications. London, UK. 439 pp.

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APPENDIX A
FIELD DATA SUMMARY

Longboat Pass, M-5, M-12, M-14 Seagrass Data

Species: (SF) <i>Syringodium filiforme</i> , (TT) <i>Thalassia testudinum</i> , (HW) <i>Halodule wrightii</i>						
Abundance: r = solitary, + = few, 1 = < 5% cover, 2 = 5-25% cover, 3 = 26-50% cover, 4 = 51-75% cover, 5 = 76-100% cover						
Epiphyte density: 1=clean, 2=light, 3=moderate, 4=heavy						
Sediments: 1=shelly sand, 2=sand, 3=muddy sand, 4=muck, 5=rocky/rubble						
M-5						
Transect 1	Date	9/27/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0						
105	SF	3	50	30	4	
110	SF/TT	5/+	100/2	35	4	
115	TT	4	100	35	4	
120	TT	4	100	35	4	
125	TT	4	100	35	4	
130	TT	4	100		4	
Transect 2						
Transect 2	Date	9/27/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	SF	5	100	35	4	
5	SF	5	100	35	4	
120	SF	2	35	35	4	
Transect 3						
Transect 3	Date	9/27/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	SF/TT	2/4	85/100	25/30	4	
5	SF/TT	5/3	100/80	25/30	4	
10	SF/TT	5	100	30	4	
15	HW	3	50	20	3	
Transect 4						
Transect 4	Date	9/27/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	HW	5	100	25	4	
5	HW/TT	2/4	55/85	25/35	4	
10	HW	1	70	25		
Transect 5						
Transect 5	Date					
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	HW	2	25			
Transect 6						
Transect 6	Date					
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	HW	5	100			
5	HW/SF	4/5	100/100			
Transect 7						
Transect 7	Date					
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	HW	5	100			
5	HW	5	100			
10	HW	5	10			
Transect 8						
Transect 8	Date					
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0						bare
Transect 9						
Transect 9	Date					
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0						bare
Transect 10						
Transect 10	Date					
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0						bare

Longboat Pass, M-5, M-12, M-14 Seagrass Data

Species: (SF) <i>Syringodium filiforme</i> , (TT) <i>Thalassia testudinum</i> , (HW) <i>Halodule wrightii</i>						
Abundance: r = solitary, + = few, 1 = < 5% cover, 2 = 5-25% cover, 3 = 26-50% cover, 4 = 51-75% cover, 5 = 76-100% cover						
Epiphyte density: 1=clean, 2=light, 3=moderate, 4=heavy						
Sediments: 1=shelly sand, 2=sand, 3=muddy sand, 4=muck, 5=rocky/rubble						
M-5						
Transect 11	Date					
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0						bare
Transect 12	Date					
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0						bare
						deep hole filled with dead TT
Transect 13	Date					
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	HW	4	80			
15	HW	2	10			
20	HW	1	5			
Transect 14	Date					
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0						No Grass
Transect 15	Date	9/25/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0						bare
Transect 16	Date	9/25/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT/SF	5/3	100/100	30/25	4-Apr	
5	TT/SF	4/4	100/100	30/25	4-Apr	
10	SF	5	100			
15	TT/SF	2/3	25/80	30/25	4-Apr	
20	SF	5	100			
25	SF	5	100	30		
30	SF	3	65	30		
35	SF	2	40	20		
40	HW	+	3	15		
120	SF	4	100			
125	HW	3	100			
Transect 17	Date	9/25/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT/SF	5/5	100/100	30/30	4	
5	TT/SF	5/5	100/100	30/30	4	
10	TT/SF	5/5	100/100			
15	TT/SF	5/5	100/100			
20	SF	5	100	30	4	
25	SF	5	100			
30	SF	5	100			
40	HW	4	100			
55	HW	3	85			
105	SF	3	65			
110	TT/SF	1/1	30/25			
115	HW	5	100			
120	HW	5	100			

Longboat Pass, M-5, M-12, M-14 Seagrass Data

Species: (SF) <i>Syringodium filiforme</i> , (TT) <i>Thalassia testudinum</i> , (HW) <i>Halodule wrightii</i>						
Abundance: r = solitary, + = few, 1 = < 5% cover, 2 = 5-25% cover, 3 = 26-50% cover, 4 = 51-75% cover, 5 = 76-100% cover						
Epiphyte density: 1=clean, 2=light, 3=moderate, 4=heavy						
Sediments: 1=shelly sand, 2=sand, 3=muddy sand, 4=muck, 5=rocky/rubble						
M-5						
Transect 18	Date	9/25/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT	4	100			
5	TT/SF	3/5	40/100			
10	TT/SF	4/4	100/100			
15	TT/SF	5/5	100/100			
20	TT/SF	5/5				
25	SF	4				
30	SF	3				
35	SF	3				
90	SF	5	100			
95	TT/SF	5/5	85/100			
100	TT/SF	5/5	100/100			
105	TT/SF	5/2	100/100			
110	TT/HW	4/5	95/100			
115	HW	5	100			
Transect 19						
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT/SF	1/5	20/100	30		
5	TT/SF	1/5	25/100			
10	TT/SF	2/3	60/100			
15	SF	5	100			
20	SF	5	100			
25	SF	5	100			
30	SF	5	100			
35	SF	3	80			
80	SF	5	100			
85	SF	4	90			
90	SF	5	100			
95	TT/SF	+/5	3/100			
100	TT/SF	+/5	4/100			
105	TT/SF	4/5	90/100			
110	HW	5	100			
115	HW	5	100			
Transect 20						
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT/SF	2/5	35/100	35	4	
5	TT/SF	4/5	85/100		4	
10	TT/SF	4/5	90/100		4	
15	TT/SF	3/5	70/100			
20	TT/SF	2/3	25/90			
25	SF	5	100			
30	SF	5	100			
35	SF	3	75			
85	SF	3	90			
90	SF	3	90			
95	SF	4	100			
100	SF	4	100			
105	SF	5	100			
110	TT/SF	3/5	65/100			
115	TT/SF	4/5	95/100			
120	TT/HW	2/5	25/100			
125	HW	5	100			

Longboat Pass, M-5, M-12, M-14 Seagrass Data

Species: (SF) <i>Syringodium filiforme</i> , (TT) <i>Thalassia testudinum</i> , (HW) <i>Halodule wrightii</i>						
Abundance: r = solitary, + = few, 1 = < 5% cover, 2 = 5-25% cover, 3 = 26-50% cover, 4 = 51-75% cover, 5 = 76-100% cover						
Epiphyte density: 1=clean, 2=light, 3=moderate, 4=heavy						
Sediments: 1=shelly sand, 2=sand, 3=muddy sand, 4=muck, 5=rocky/rubble						
M-5						
Transect 21	Date	9/25/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT	4	100			
5	TT	4	100			
10	TT	4	100			
15	TT	4	100			
20	TT/SF	5/3	100/100			
25	TT/SF	1/4	100/100			
30	SF	5	100			
45	HW	2	35			
80	SF/HW	3/1	80/20			
100	TT/SF	3/2	80/65			
105	TT/SF	3/1	85/35			
110	TT/SF	3/5	80/100			
115	TT/SF	5/5	100/100			
120	TT/SF/HW	3/+/4	65/10/100			
Transect 22	Date	9/25/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT/SF	5/5	100/100			
5	TT/SF	5/5	100/100			
10	TT/SF	1/5	100/100			
15	TT/SF	5/2	100/100			
20	TT/SF	1/5	100/100			
25	SF	5	100			
85	HW	1	10			
95	SF	5	100			
100	SF	5	100			
105	TT/SF	5/5	100/100			
110	TT/SF	5/4	100/100			
115	TT/SF	5/5	100/100			
120	HW	5	100			
125	HW	5	100			
130	TT/HW	5/1	100/100			
Transect 23	Date					
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT/SF	3/3	80/80			
5	TT/SF	3/5	100/100			
10	TT/SF	4/4	100/100			
15	TT/SF	4/3	100/100			
20	TT/SF	3/3	100/100			
25	SF	4	100			
30	SF	4	100			
85	SM	1	5			
95	TT/SF	1/5	100/100			
100	SF	5	100			
105	SF/HW	5/3	100/100			
110	HW	5	100			
115	HW	5	100			
120	HW	5	100			

Longboat Pass, M-5, M-12, M-14 Seagrass Data

Species: (SF) <i>Syringodium filiforme</i> , (TT) <i>Thalassia testudinum</i> , (HW) <i>Halodule wrightii</i>						
Abundance: r = solitary, + = few, 1 = < 5% cover, 2 = 5-25% cover, 3 = 26-50% cover, 4 = 51-75% cover, 5 = 76-100% cover						
Epiphyte density: 1=clean, 2=light, 3=moderate, 4=heavy						
Sediments: 1=shelly sand, 2=sand, 3=muddy sand, 4=muck, 5=rocky/rubble						
M-5						
Transect 24	Date					
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT	5	100			
5	TT	5	100			
10	TT/HW	5/1	100/100			
15	TT/HW	5/2	100/100			
20	TT/HW	5/2	100/100			
25	TT/SF	2/5	100/100			
60	HW	1	10			
95	SF	5	100			
100	SF	5	100			
105	SF	5	100			
110	SF/HW	5/5	100/100			
115	HW	5	100			
120	HW	5	100			
125	HW	5	100			
130	HW	5	100			
Transect 25	Date					
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	HW	5	100			
5	TT/HW	5/1	100/100			
10	TT/SF	5/2	100/100			
15	TT/SF	5/5	100/100			
20	TT/SF	1/5	100/100			
25	SF	5	100			
30	SF	2	50			
35	SF	1	10			
80	SF	5	100			
85	TT/SF	3/3	100/100			
90	TT/SF	4/4	100/100			
95	TT	3	70			
100	TT/HW	4/1	60/90			
105	HW	5	100			
110	HW	5	100			
115	HW	5	100			
120	HW	5	100			
125	HW	2	25			
Transect 26	Date	9/26/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	SF	5	100	20	3	
5	SF	5	100			
10	SF	5	100			
15	SF	5	100			
20	SF	5	100			
25	SF	5	100			
30	SF/HW	4/4	100/-			
90	SF	5	100			
95	SF	5	100			
100	TT/SF	4/4	100/100			
105	TT/SF	5/4	100/100			
110	TT/SF	5/5	100/100			
115	HW	5	100	20		
120	HW	5	100			
125	HW	5	100			
130	HW	5	100			

Longboat Pass, M-5, M-12, M-14 Seagrass Data

Species: (SF) <i>Syringodium filiforme</i> , (TT) <i>Thalassia testudinum</i> , (HW) <i>Halodule wrightii</i>						
Abundance: r = solitary, + = few, 1 = < 5% cover, 2 = 5-25% cover, 3 = 26-50% cover, 4 = 51-75% cover, 5 = 76-100% cover						
Epiphyte density: 1=clean, 2=light, 3=moderate, 4=heavy						
Sediments: 1=shelly sand, 2=sand, 3=muddy sand, 4=muck, 5=rocky/rubble						
M-5						
Transect 27	Date	9/26/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT/SF	5/1	100/100			
5	TT/SF	5/5	100/100			
10	TT/SF	1/5	50/100			
15	SF	5	100			
20	SF	4	80			
85	TT/SF	3/3	80/80			
90	TT/SF	4/4	100/100			
95	TT/SF	4/4	100/100			
100	TT/SF	4/4	100/100			propeller scar
105	TT/SF	5/5	100/100			
110	TT/HW	5/5	100/100			
115	TT/HW	5/5	100/100			
120	TT/HW	5/3	100/100			
Transect 28						
Transect 28	Date	9/26/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT/HW	2/5	20/100			
5	TT	5	100			
10	TT/SF	5/5	100/100			
15	TT/SF	4/5	100/100			
20	TT/SF	4/5	100/100			
25	SF	5	100			
90	SF	3	100			
95	TT/SF	5/5	100/100			
100	TT/SF	5/3	100/100			
105	TT/SF	5/5	100/100			
110	HW	5	100			
115	HW	5	100			
120	HW	5	100			
125	HW	5	100			
Transect 29						
Transect 29	Date	9/26/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT/SF	5/5	100/100			
5	SF	5	100			
10	TT/SF	4/5	100/100			
15	SF	5	100			
20	SF	5	100			
25	TT/SF	1/5	40/100			
30	SF	5	100			sponges, soft coral, hard coral
80	SF	3	60			
85	SF	5	100			
90	TT/SF	4/4	100/100			
95	TT/SF	5/5	100/100			
100	HW	5	100			
105	HW	5	100			
110	HW	5	100			
115	HW	5	100			

Longboat Pass, M-5, M-12, M-14 Seagrass Data

Species: (SF) <i>Syringodium filiforme</i> , (TT) <i>Thalassia testudinum</i> , (HW) <i>Halodule wrightii</i>						
Abundance: r = solitary, + = few, 1 = < 5% cover, 2 = 5-25% cover, 3 = 26-50% cover, 4 = 51-75% cover, 5 = 76-100% cover						
Epiphyte density: 1=clean, 2=light, 3=moderate, 4=heavy						
Sediments: 1=shelly sand, 2=sand, 3=muddy sand, 4=muck, 5=rocky/rubble						
M-5						
Transect 30	Date	9/26/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	HW	5	100	8		
5	HW	5	100			
10	TT/SF	5/5	100/100			
15	TT/SF	3/3	60/60			
20	SF	5	100			
80						ledge/rock w sponges, no grass
85	SF	4	80			
90	SF	4	80			
95	SF	5	100			
100	SF	5	100			
105	SF	5	100			
110	HW	5	100			
115	HW	5	100			
120	HW	5	100			
Transect 31	Date	9/26/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT/SF	5/1	100/100			
5	TT/SF	3/3	60/60			
10	SF	5	100			
20	SF	2	50			
25	SF	5	100			
30	SF	3	50			
90	SF	5	100			
95	SF	5	100			
100	TT/SF	1/5	100/100			
105	TT/SF	5/1	100/100			
110	HW	5	100			
115	HW	5	100			
120	HW	2	50			
125	HW	3	50			
Transect 32	Date	9/26/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	SF	5	100	30	4	
5	SF	5	100	30	4	
15	SF	5	100	30	2	
20	SF	3	50	25	2	
25	SF	5	100	35	3	
110	SF	5	100	35	2	
115	SF	4	100	25	2	
120	HW	4	95	20	2	
125	HW	5	100	25	2	
130	HW	5	100	20	2	

Longboat Pass, M-5, M-12, M-14 Seagrass Data

Species: (SF) <i>Syringodium filiforme</i> , (TT) <i>Thalassia testudinum</i> , (HW) <i>Halodule wrightii</i>						
Abundance: r = solitary, + = few, 1 = < 5% cover, 2 = 5-25% cover, 3 = 26-50% cover, 4 = 51-75% cover, 5 = 76-100% cover						
Epiphyte density: 1=clean, 2=light, 3=moderate, 4=heavy						
Sediments: 1=shelly sand, 2=sand, 3=muddy sand, 4=muck, 5=rocky/rubble						
M-5						
Transect 33	Date	9/26/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT	5	100	3		
5	TT/HW	+/5	5/100	30/25	3	
10	HW	5	100	30	3	
15	SF/HW	5/4	100/90	35/30	3	
20	SF	5	100	35	3	
25	TT/SF	2/5	25/100	40/35	3	
30	SF	5	100	40	3	
35	SF	5	100			
105	HW	3	100	20	4	
115	TT	3	95	25	4	
120	TT	3	100	30	4	
125	TT	3	100	30	4	
Transect 34	Date	9/26/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	HW	5	100	20	4	
5	TT/HW	4/4	100/100	30/20	4	
10	TT	5	100	35	4	
15	TT/SF	2/5	15/100	35/35	4	
20	TT/SF	3/5	70/100	35/35	4	
25	SF	5	100	35		
100	HW	3	75	20		
130	SF	3	80	35	3	
Transect 35	Date	9/26/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0						No Grass
Transect 36	Date	9/27/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	HW	3	100	15	4	
5	HW	4	100	15	4	
10	HW	4	100	15	4	
15	TT	3	100	25	4	
20	TT/SF	+/5	6/100	30/30	4/4	
25	TT/SF	+/5	7/50	30/30	3/3	
Transect 37	Date	9/27/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	HW	5	100	25	4	
5	TT/HW	4/5	90/100	35/25	4/4	
10	TT/SF	4/+	100/10	35/30	4/4	
15	TT/SF	5/2	100/35	35/30	4/4	
20	TT/SF	4/2	95/70	35/30	4/4	
25	TT/SF	1/4	15/100	35/30	4/4	
30	SF	3	100	35		

Longboat Pass, M-5, M-12, M-14 Seagrass Data

Species: (SF) <i>Syringodium filiforme</i> , (TT) <i>Thalassia testudinum</i> , (HW) <i>Halodule wrightii</i>						
Abundance: r = solitary, + = few, 1 = < 5% cover, 2 = 5-25% cover, 3 = 26-50% cover, 4 = 51-75% cover, 5 = 76-100% cover						
Epiphyte density: 1=clean, 2=light, 3=moderate, 4=heavy						
Sediments: 1=shelly sand, 2=sand, 3=muddy sand, 4=muck, 5=rocky/rubble						
M-5						
Transect 38	Date	9/27/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT/SF	4/4	100/100	35/25	4	
5	TT/SF	4/4	100/100	35/25	4	
10	TT/SF	4/4	100/100	35/25	4	
15	TT/SF	3/4	100/100	35/25	4	
20	TT/SF	4/4	100/100	35/25	4	
25	SF	5	100	35	4	
30	SF	5	100			
90	HW	3	65	15	3	
130	HW	4	100	20	4	
Transect 39						
Transect 39	Date	9/27/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0						bare
Transect 40						
Transect 40	Date	9/27/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0						bare
Transect 41						
Transect 41	Date	9/27/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT	5	100	35	4	
5	TT	5	100	35	4	
10	SF	5	100	35	4	
15	SF	5	100	35	4	
20	HW	3	75	20	3	
110	HW	3	50	20	3	
Transect 42						
Transect 42	Date	9/27/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT	5	100			
5	TT	5	100			
10	TT	5	100			
15	HW	5	90			
25	HW	+	80			
Transect 43						
Transect 43	Date	9/27/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT	5	100			
5	TT	5	100			
10	TT/HW	1/2	20/80			
15	HW	3	100			
100	HW	4	80			
Transect 44						
Transect 44	Date	9/27/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
20	TT	3	60			
Transect 45						
Transect 45	Date	9/27/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	HW	4	50			
5	HW	4	20			

Longboat Pass, M-5, M-12, M-14 Seagrass Data

Species: (SF) <i>Syringodium filiforme</i> , (TT) <i>Thalassia testudinum</i> , (HW) <i>Halodule wrightii</i>						
Abundance: r = solitary, + = few, 1 = < 5% cover, 2 = 5-25% cover, 3 = 26-50% cover, 4 = 51-75% cover, 5 = 76-100% cover						
Epiphyte density: 1=clean, 2=light, 3=moderate, 4=heavy						
Sediments: 1=shelly sand, 2=sand, 3=muddy sand, 4=muck, 5=rocky/rubble						
M-5						
Transect 46	Date					
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	HW	2	40			
115	TT	1	10			
120	TT/SF	1/5	10/100			
125	TT/SF	2/5	20/100			
Transect 47	Date					
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
25	SF/HW	3/2	50/40			
100	HW	1	10			
Transect 48a	Date					
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
5	HW	3	40			
20	HW	1	20			
120	HW	2	40			
125	HW	3	60			
Transect 48b	Date					
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0						bare
Transect 49	Date					
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0						bare

Longboat Pass, M-5, M-12, M-14 Seagrass Data

Species: (SF) <i>Syringodium filiforme</i> , (TT) <i>Thalassia testudinum</i> , (HW) <i>Halodule wrightii</i>						
Abundance: r = solitary, + = few, 1 = < 5% cover, 2 = 5-25% cover, 3 = 26-50% cover, 4 = 51-75% cover, 5 = 76-100% cover						
Epiphyte density: 1=clean, 2=light, 3=moderate, 4=heavy						
Sediments: 1=shelly sand, 2=sand, 3=muddy sand, 4=muck, 5=rocky/rubble						
M-12						
Transect 1	Date	9/28/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	SF	5	100	35	4	
5	SF					
10	SF/HW	5/+	100/5	35/15	4	
15	SF/HW	5/+	100/15	35/15	4	
20	SF/HW	5/+	100/15	35/15	4	
25	SF/HW	5/+	100/5	35/15	4	
30	SF/HW	5/+	100/5	35/15	4	
35	SF/HW	5/+	65/15	25/10	40179	
Transect 2						
Transect 2	Date	9/28/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	SF	5	100	35	4	
5	TT/SF	+/2	20/80	35/35	4	
10	TT/SF	1/2	25/85	35/35	4	
15	TT/SF	2/R	85/1	35/25	3	
20	TT	2	75	30	2	
25	TT	2	85	25	2	
30	TT	2	90	25	2	
35	TT	2	70	30		
125	TT	1	20	25	2	
Transect 3						
Transect 3	Date	9/28/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	SF	5	100	35	4	
5	SF					
10	SF/HW	5/+	100/5	35/15	4	
15	SF/HW	5/+	100/5	35/15	4	
20	SF/HW	5/+	100/5	35/15	4	
25	SF/HW	5/+	100/5	35/15	4	
30	SF/HW	5/+	100/5	35/15	4	
35	SF/HW	1/+	65/15	25/10	1/1	
Transect 4						
Transect 4	Date	9/28/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	SF	5	100	35	4	
5	TT/SF	+/2	20/80	35/35	4	
10	TT/SF	1/2	25/85	35/35	4	
15	TT/SF	2/R	85/1	35/25	3	
20	TT	2	75	30	2	
25	TT	2	85	25	2	
30	TT	2	90	25	2	
35	TT	2	70	30		
125	TT	1	20	25	2	
Transect 5						
Transect 5	Date	9/28/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT/SF	+/3	5/90	35/35	4/4	
5	TT	2	85	35	4	
10	TT	2	85	35	4	
125	SF	5	100	4		

Longboat Pass, M-5, M-12, M-14 Seagrass Data

Species: (SF) <i>Syringodium filiforme</i> , (TT) <i>Thalassia testudinum</i> , (HW) <i>Halodule wrightii</i>						
Abundance: r = solitary, + = few, 1 = < 5% cover, 2 = 5-25% cover, 3 = 26-50% cover, 4 = 51-75% cover, 5 = 76-100% cover						
Epiphyte density: 1=clean, 2=light, 3=moderate, 4=heavy						
Sediments: 1=shelly sand, 2=sand, 3=muddy sand, 4=muck, 5=rocky/rubble						
M-12						
Transect 6						
	Date	9/28/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	SF	5	100	35	3	bare
5	TT/SF	+/4	15/95	35/35	3/3	
10	TT/SF	R/4	1/100	35/35	3/3	
15	SF	5	100	35	3	
20	SF	5	100	35	3	
25	SF	5	100	35	3	
30	SF	3	95	35	3	
Transect 7						
	Date	9/28/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	TT/SF	+/4	5/80	35/35		
5						SAND
Transect 8						
	Date	9/28/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	SF	5	100			
5	TT/SF	+/2	10/85	35/35		
10	SF	2	85	35		
Transect 9						
	Date	9/28/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0						SAND
5						SAND
Transect						
	Date	9/28/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0						
10						
Transect 10						
	Date	9/28/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0						SAND
5						

Longboat Pass, M-5, M-12, M-14 Seagrass Data

Species: (SF) <i>Syringodium filiforme</i> , (TT) <i>Thalassia testudinum</i> , (HW) <i>Halodule wrightii</i>						
Abundance: r = solitary, + = few, 1 = < 5% cover, 2 = 5-25% cover, 3 = 26-50% cover, 4 = 51-75% cover, 5 = 76-100% cover						
Epiphyte density: 1=clean, 2=light, 3=moderate, 4=heavy						
Sediments: 1=shelly sand, 2=sand, 3=muddy sand, 4=muck, 5=rocky/rubble						
M-14						
Transect 5						
	Date	9/27/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0						
35	TT	2	23	5		
	0					
110	0					
Transect 6						
	Date	9/27/10				
Station (m)	Species	Abundance	Quads Occupied	Blade Length (cm)	Epiphyte Density	Station Comments
0	HW	2	12	2 to 7		
5	HW	2	15			
10	HW	2	19			
10	SF	2	16			
15	HW	2	26			
15	SF	2	12			
20	HW	2	24			
20	SF	2	11			
25	HW	2	20			
25	SF	2	17			
110						

GIWW - LONGBOAT PASS ENVIRONMENTAL ASSESSMENT

APPENDIX G

GEO-TECHNICAL REPORT

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**Final Report of Conceptual Geotechnical Data
Vibracore Borings GIWW/Vicinity of Longboat Pass
Contract W912EP-05-D-0009
Manatee County, Florida
WOLF/WPC Project No. EQ105037**

- Prepared For -

**U.S. Army Corps of Engineers
Jacksonville District
701 San Marco Boulevard, 3 East
Jacksonville, Florida 32207**

- Prepared By -

**WOLF/WPC
3047-4 St. Johns Bluff Road South
Jacksonville, Florida 32246**

March 11, 2011

Ms. Barbara Nist
U.S. Army Corps of Engineers
701 San Marco Boulevard, 3 East
Jacksonville, Florida 32207

Final Geotechnical Data Report
Vibracore Borings GIWW/Vicinity of Longboat Pass
Contract W912EP-05-D-0009
Volusia County, Florida
WOLF/WPC Project No. EQ105037
USACE Task Order No. 139

Dear Ms. Nist:

WOLF/WPC has performed the field and laboratory geotechnical services for the Vibracore Borings in the Vicinity of Longboat Pass, Manatee County, Florida. This conceptual report presents our understanding of the project, outlines our exploratory procedures, and presents the field and laboratory data obtained for the project.

We have enjoyed assisting you on this project and look forward to serving as your geotechnical consultant on the remainder of this project and on future projects. If you have any questions concerning this report, please contact us.

Respectfully Submitted,
WOLF/WPC



Robert M. Cords, P.E.
Senior Geotechnical Engineer
Registered, Florida No. 71863

Distribution: U.S. Army Corps of Engineers (3)
File (1)

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APPENDICES

APPENDIX A

- Site Location Map
- Field Exploration Plan

APPENDIX B

- Drilling Logs for Vibracore Borings

APPENDIX C

- Photographs

APPENDIX D

- Table: Visual % Shell and Fines
- Laboratory Testing Results

SECTION 1.0 – INVESTIGATION SCOPE

The scope of services for this investigation was provided in the scope of work (SOW) dated June 14, 2010, and was performed under the existing contract W912EP-05-D-0009. The requested field scope of services for this investigation included performing twenty-seven (27) Vibracore borings. The laboratory testing scope of services consisted of index property tests, including grain-size sieve analyses, visual shell, and carbonate content testing.

The project site is shown on the Site Location Map and Field Exploration Plan in Appendix A of this report. The proposed depth of the Vibracore borings was 10 feet below the mud line or to refusal, whichever was most shallow. Laboratory testing was assigned by the U.S. Army Corps of Engineers (USACE) following review of preliminary field drilling logs and soil samples.

SECTION 2.0 – INVESTIGATION PURPOSE

The offshore part of the Longboat Pass Entrance Channel, Manatee County will be relocated to the south, into an area less prone to shoaling. Sediment samples were collected via vibracoring from the new offshore channel location to provide geotechnical data. In addition, vibracore borings were performed for regular scheduled maintenance in the inner part of the Longboat Pass Channel and at the Gulf Intracoastal Waterway (GIWW) Cut M-4, Cut M-5, Cut M-7, Cut M-12, Cut M-14, Cut SC2, and Cut SC3. The area of investigation includes Longboat Pass and locations along the Gulf Intracoastal Water Way from Longboat Key, extending to slightly north of Cow and Calf Key. The top-of-hole elevations were between -3.93 feet and -10.51 feet Mean Lower Low Water (MLLW) during the time of our exploration.

SECTION 3.0 – FIELD EXPLORATION

3.1 General

The field exploration conducted for this investigation included performing twenty-seven (27) Vibracore borings at locations specified by the U.S. Army Corps of Engineers (USACE). Exploration point coordinates (Northings and Eastings) were provided by USACE. The exploration points were initially laid out using differential GPS equipment on the work vessel following conversion of the coordinates from State Plane Coordinates to Latitude and Longitudes using the conversion program CORPSCON.

The locations of selected borings were adjusted by the Corps of Engineers technical representative to account for site conditions at the time of our exploration. In addition, two borings (VB-LBP10-4 & VB-LBP10-5) were removed from the scope of work since they were located outside the proposed dredge area, and one boring (VB-GIWWM5-10-5) was added to the scope to provide additional needed data. The surveyed position of the test locations were determined using Global Positioning System (GPS) Real Time Kinematics (RTK) methods. The equipment used included an EPOCH 35 GPS receiver and a TDS NOMAD data collector. The horizontal coordinates were recorded in State Plane coordinates (Florida West) NAD83, and the elevations were recorded in MLLW. The top-of-hole elevation was measured by obtaining the boat deck elevation with the RTK GPS equipment and then measuring the distance from the boat deck to the top-of-hole using an 8-pound mushroom anchor attached to 100-pound test monofilament line. The distance from the boat deck to top-of-hole was then subtracted from the boat deck elevation to obtain the top-of-hole elevation. The following tables summarize the exploration locations, depths, and show the calculation of the bottom elevation:

Table 3.1-Summary of Exploration Point Locations and Depths

POINT NAME	NORTHING COORDINATE LOCATION	EASTING COORDINATE LOCATION	EXPLORATION DEPTH / FEET	DATE PERFORMED
VB-LBP10-1	1133135.8	433879.1	9	10/13/2010
VB-LBP10-2	1132503.2	433714.4	10	10/13/2010
VB-LBP10-3	1131461.6	433500.7	11.5	10/13/2010
*VB-LBP10-4	1129511.0	430845.7	Not Sampled	10/11/2010
*VB-LBP10-5	1129253.5	430744.0	Not Sampled	10/11/2010
VB-LBP10-6	1129086.4	430533.7	10.2	10/11/2010
VB-LBP10-7	1131001.1	432296.6	12.5	10/12/2010
VB-LBP10-8	1130530.5	431440.6	10.5	10/11/2010
VB-LBP10-9	1129853.3	430686.0	10	10/11/2010
VB-LBP10-10	1129265.6	429831.8	12.2	10/11/2010
VB-LBP10-11	1128842.7	429360.7	10.75	10/11/2010
VB-GIWWM4-10-1	1122895.8	443578.7	13	10/11/2010
VB-GIWWM4-10-2	1122321.6	444243.3	10.5	10/11/2010
VB-GIWWM4-10-3	1121795.6	444898.4	10.5	10/11/2010
VB-GIWWM5-10-1	1128225.9	437588.2	11.8	10/11/2010
VB-GIWWM5-10-2	1129249.7	437120.5	11.7	10/11/2010
VB-GIWWM5-10-3	1131343.7	436263.0	11.7	10/12/2010
VB-GIWWM5-10-4	1131881.7	436081.6	11	10/12/2010
**VB-GIWWM5-10-5	1128600.4	437298.5	11	10/13/2010
VB-GIWWM7-10-1	1143388.0	430765.7	11.4	10/12/2010
VB-GIWWM7-10-2	1144164.5	430586.7	11	10/12/2010
VB-GIWWM7-10-3	1145657.0	430161.4	11	10/12/2010
VB-GIWWM12-10-1	1158205.5	430825.0	11.5	10/12/2010
VB-GIWWM13-10-1	1161030.8	429178.3	11	10/12/2010
VB-GIWWM14-10-1	1162955.5	428548.3	11	10/12/2010
VB-GIWWSC2-10-1	1200802.4	438079.5	11.3	10/12/2010
VB-GIWWSC2-10-2	1201399.2	437876.3	12.2	10/12/2010
VB-GIWWSC3-10-1	1221023.6	434901.1	10.5	10/12/2010
VB-GIWWSC3-10-2	1209816.9	435301.6	11	10/12/2010

*Sediment elevation below -12 feet MLLW at time of exploration, boring location removed from project scope

**Boring location added to original project scope

Table 3.2-Summary of Top of Hole Elevations

BORING DESIGNATION	MEASURED WATER DEPTH (FT)	MEASURED BOAT DECK TO BOTTOM (FT)	SURVEYED DECK ELEVATION (NAVD 88) (FT)	BOTTOM ELEVATION NAVD 88 (FT)	BOTTOM ELEVATION MLLW (FT)
VB-LBP10-1	8.2	10.6	1.41	-9.19	-7.70
VB-LBP10-2	7.4	9.8	1.22	-8.58	-7.09
VB-LBP10-3	9.9	12.3	1.03	-11.27	-9.78
VB-LBP10-4	12.8	15.2	1.4	-13.80	-12.31
VB-LBP10-5	11.3	13.7	1.4	-12.30	-10.81
VB-LBP10-6	10.9	13.2	1.2	-12.00	-10.51
VB-LBP10-7	9.7	12.1	2.07	-10.03	-8.54
VB-LBP10-8	6.5	8.9	1.8	-7.10	-5.61
VB-LBP10-9	6.0	8.4	1.6	-6.80	-5.31
VB-LBP10-10	5.5	7.8	0.8	-7.00	-5.51
VB-LBP10-11	8.0	10.4	0.93	-9.47	-7.98
VB-GIWWM4-10-1	8.2	10.6	1.92	-8.68	-7.19
VB-GIWWM4-10-2	7.9	10.3	1.78	-8.52	-7.03
VB-GIWWM4-10-3	8.0	10.4	1.66	-8.74	-7.25
VB-GIWWM5-10-1	9.1	11.5	2.26	-9.24	-7.75
VB-GIWWM5-10-2	8.5	10.9	2.31	-8.59	-7.10
VB-GIWWM5-10-3	10.2	12.6	2.19	-10.41	-8.92
VB-GIWWM5-10-4	8.5	10.9	2.27	-8.63	-7.14
VB-GIWWM5-10-5	4.5	6.9	1.48	-5.42	-3.93
VB-GIWWM7-10-1	5.9	8.3	1.86	-6.44	-4.95
VB-GIWWM7-10-2	10.2	12.6	1.75	-10.85	-9.36
VB-GIWWM7-10-3	10.5	12.9	1.69	-11.21	-9.72
VB-GIWWM12-10-1	6.2	8.6	1.68	-6.92	-5.43
VB-GIWWM13-10-1	10.0	12.4	1.5	-10.90	-9.41
VB-GIWWM14-10-1	5.7	8.1	1.5	-6.60	-5.11
VB-GIWWSC2-10-1	7.8	10.2	1.24	-8.96	-7.47
VB-GIWWSC2-10-2	5.7	8.1	1.24	-6.86	-5.37
VB-GIWWSC3-10-1	9.7	12.1	1.64	-10.46	-8.97
VB-GIWWSC3-10-2	7.2	9.6	1.3	-8.30	-6.81

3.2 Vibracore Borings

The vibracore borings were performed by Athena Technologies on October 11, 12, and 13, 2010. Water depths ranged from 4.5 to 12.8 feet at the time of our exploration. The vibracore borings were performed with the Athena Technologies work vessel Artemis. The Artemis is a 30-foot long aluminum catamaran hull and drafts 1.5 to 2.5 feet of water.

The vibracore samples were collected by locating the vessel over the test location and setting a three-point anchor system to maintain position.

Once in position, the sample was obtained by vibrating a 3.5-inch diameter, thin-walled, metal tube into the bottom sediments to a depth of 10 feet or slightly greater or until refusal was met, whichever was most shallow, and then extracting the tube and sample using a winch. The metal tube was not fitted with a core catcher. Instead, a check valve was located at the top of the tube to provide a slight vacuum during sample extraction.

Each sample was retained within the sampling tube. While on the vessel, each sample tube was measured and cut into sealed sections of up five linear feet. After recording the depth of penetration and the recovery, the sample tubes were labeled and stored for later transport to our laboratory facility in Jacksonville, Florida.

A sample recovery of 85 percent or greater was obtained at each test location. The Vibracore Boring Drilling Logs and photographs are presented in Appendix B and C respectively, of this report.

SECTION 4.0 – LABORATORY TESTING

Following review of the preliminary field logs, USACE assigned several laboratory tests on samples obtained from the vibracore operation. The laboratory testing conducted for this exploration included the following:

- 44 Sieve Analysis Tests
- 44 Visual Shell Tests
- 7 Special Carbonates Tests
- 7 Resieves (Post Special Carbonate Test)

A summary of the laboratory testing and index property testing are presented in Appendix D, Table 1 of this report. The gradation curves are provided in Appendix D after Table 1. The special carbonate test results are presented in the CO3 % column on the gradation curve sheets. The visual shell test results are presented in the CO3 % column on the gradation curve sheets and are presented as a number followed by the letters (est). Per FDEP's request, this contract was set-up to provide the special assignment Non-ASTM carbonate analysis. seven (7) sediments samples were sieved and subject to the Non-ASTM carbonate analysis. Residual

material from these samples was re-sieved to examine the grain size distribution of the material remaining after the carbonates had been removed by the test procedure.

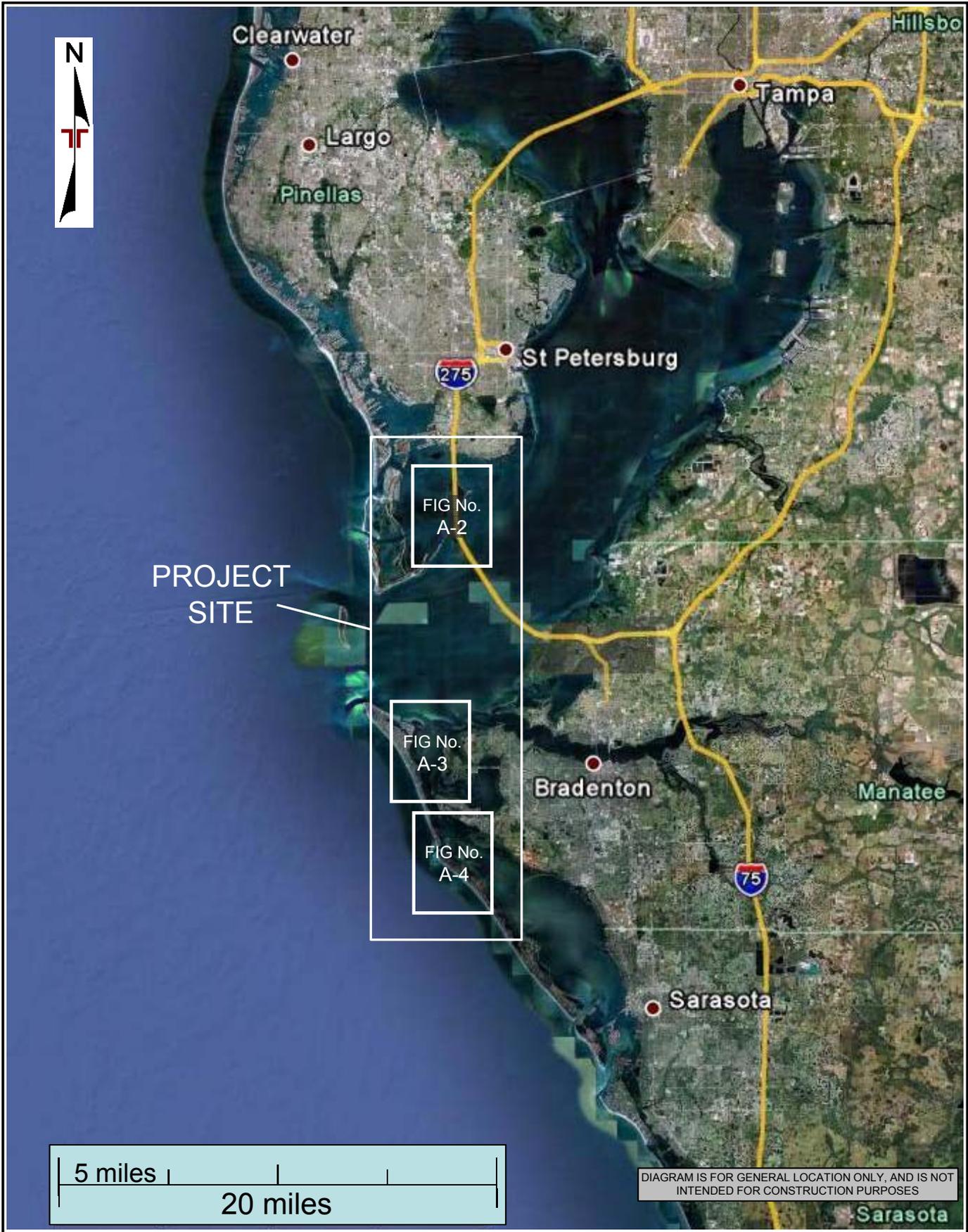
SECTION 5.0 – SUBSURFACE MATERIALS ENCOUNTERED

The encountered soils were classified using the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488. The water depth ranged from 4.5 to 12.8 feet at the test locations. Below the mud line, the vibracores generally encountered fine and medium quartz sand with trace to some sand-sized shell (SP), sand with silt (SP-SM), and silty sand (SM). In addition, minor zones of highly weathered or decomposed limestone, clay or sandy clay were also encountered. The vibracore borings performed in and around Longboat Pass encountered mostly clean sands (SP) and the borings performed along the Intracoastal Waterway generally encountered clean sands (SP) with lesser amounts of sand with silt (SP-SM) and silty fine sand (SM). One boring, VB-LBP10-1 encountered refusal on possible limestone at a depth of 9 feet below the mud line. This possible limestone layer is located well below the anticipated dredge depth of -9 feet MLLW.

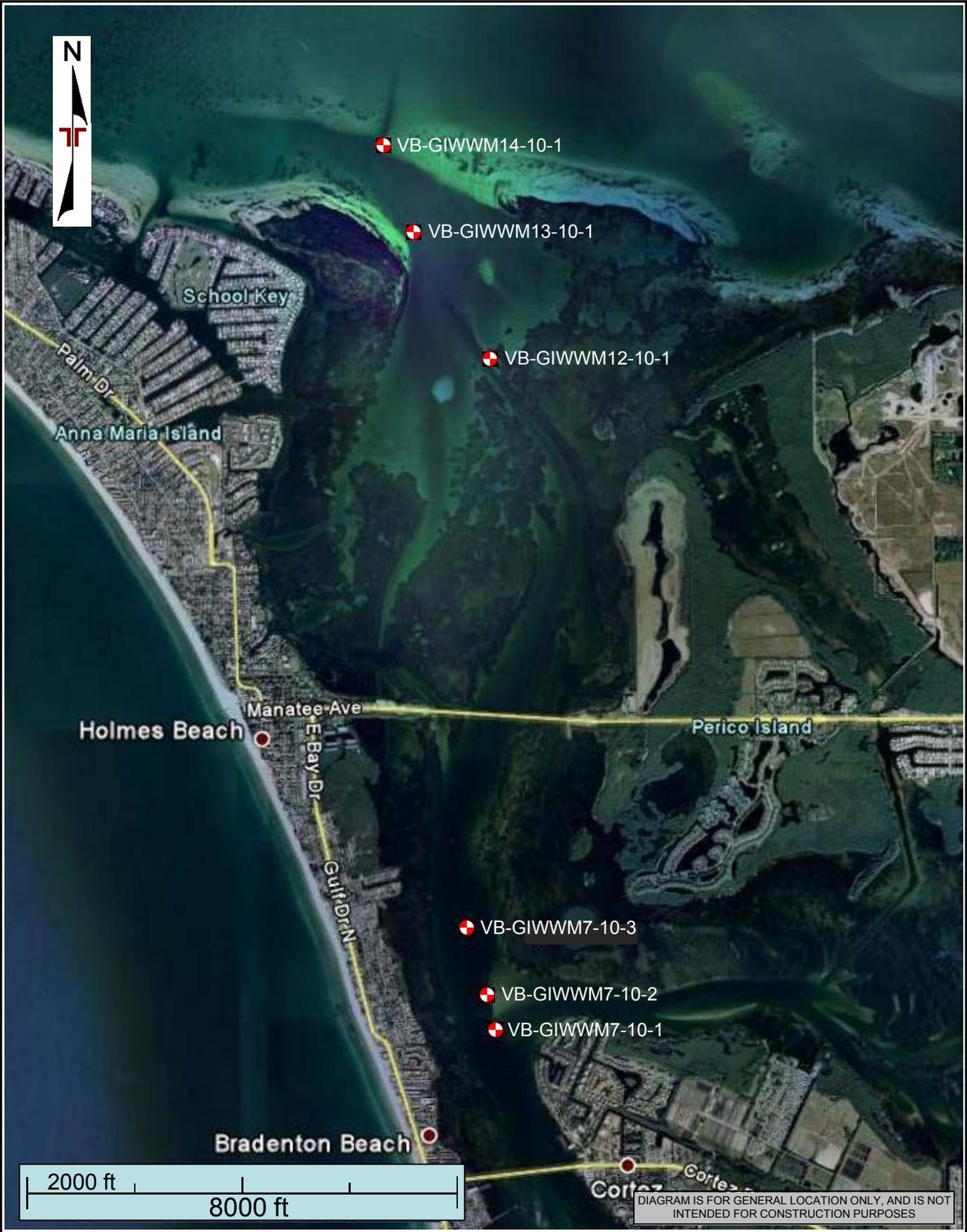
APPENDICES

APPENDIX A

- **Site Location Map**
- **Field Exploration Plan**









APPENDIX B

- **Drilling Logs for Vibracore Borings**

Boring Designation VB-LBP10-1

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass			9. SIZE AND TYPE OF BIT 3.5" Vibracore	
2. BORING DESIGNATION VB-LBP10-1		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAJ		11. MANUFACTURER'S DESIGNATION OF DRILL		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Athena Technologies, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. ELEVATION GROUND WATER		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 10-13-10
8. TOTAL DEPTH OF BORING 9.0 Ft.		16. ELEVATION TOP OF BORING -7.7 Ft.		COMPLETED 10-13-10
		17. TOTAL RECOVERY FOR BORING 88 %		
		18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-7.7	0.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace medium-grained sand-sized shell, 10YR 8/1 white (SP)	100			-7.7 Vibracore		0
					1		-10.2 Vibracore		
			At El. -12.2 Ft., mostly fine-grained sand-sized quartz, few medium to coarse-grained sand-sized shell, trace fine gravel-sized shell	73	2		-12.7 Vibracore		5
-15.6	7.9								
-16.7	9.0	N/R					-16.7		
			BORING TERMINATED IN REFUSAL						
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results						10
			SAMPLE ID SAMPLE DEPTH LABORATORY CLASSIFICATION						
			1 2.5/3.0 SP*						
			2 5.0/5.5 SP*						
			*Lab visual classification based on gradation curve. No Atterberg limits.						15

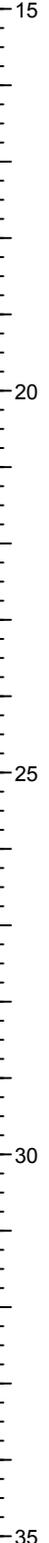
Boring Designation VB-LBP10-2

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass		9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-LBP10-2		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAJ		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER		
4. NAME OF DRILLER Athena Technologies, Inc.		12. TOTAL SAMPLES DISTURBED 3 UNDISTURBED (UD) 0		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES 0		
6. THICKNESS OF OVERBURDEN N/A		14. ELEVATION GROUND WATER		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING STARTED 10-13-10 COMPLETED 10-13-10		
8. TOTAL DEPTH OF BORING 10.0 Ft.		16. ELEVATION TOP OF BORING -7.1 Ft.		
		17. TOTAL RECOVERY FOR BORING 93 %		
		18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE REC.	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-7.1	0.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace medium-grained sand-sized shell, trace silt, 10YR 8/1 white (SP)	100			-7.1 Vibracore		0
				100	1-Post		-9.6 -9.6 Vibracore		
				100			Vibracore		
					2		-12.1 Vibracore		5
-16.4	9.3			86			Vibracore		
-17.1	10.0	NR					-17.1		10
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results						
			SAMPLE ID SAMPLE DEPTH LABORATORY CLASSIFICATION						

			1 2.5/3.0 SP*						
			1-Post 2.5/3.0 SP*						
			2 5.0/5.5 SP*						

DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS		
			PROJECT Vibracore Borings GIWW/Vicinity of		COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW	
LOCATION COORDINATES X = 433,714 Y = 1,132,503			ELEVATION TOP OF BORING -7.1 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			*Lab visual classification based on gradation curve. No Atterberg limits.						

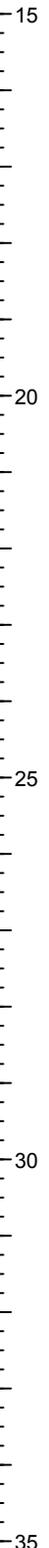


Boring Designation VB-LBP10-3

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass		9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-LBP10-3		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAJ		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER		
4. NAME OF DRILLER Athena Technologies, Inc.		12. TOTAL SAMPLES DISTURBED: 1 UNDISTURBED (UD): 0		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES 0		
6. THICKNESS OF OVERBURDEN N/A		14. ELEVATION GROUND WATER		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING STARTED: 10-13-10 COMPLETED: 10-13-10		
8. TOTAL DEPTH OF BORING 11.5 Ft.		16. ELEVATION TOP OF BORING -9.8 Ft.		
		17. TOTAL RECOVERY FOR BORING 85 %		
		18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-9.8	0.0		SAND, poorly-graded, some medium to coarse-grained sand-sized shell, some fine-grained sand-sized quartz, little fine to coarse gravel-sized shell up to 1", trace silt, 10YR 8/1 white (SP)	100			-9.8		0
						1		-11.3	
				83			Vibracore		5
-19.6	9.8								10
		NR							
-21.3	11.5						-21.3		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results SAMPLE ID SAMPLE DEPTH LABORATORY CLASSIFICATION						15

DRILLING LOG (Cont. Sheet)			INSTALLATION			SHEET 2 OF 2 SHEETS			
PROJECT Vibracore Borings GIWW/Vicinity of			COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW			
LOCATION COORDINATES X = 433,501 Y = 1,131,462			ELEVATION TOP OF BORING -9.8 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			1 1.5/2.0 SP* *Lab visual classification based on gradation curve. No Atterberg limits.						



Boring Designation VB-LBP10-6

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass		9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-LBP10-6		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAJ		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER		
4. NAME OF DRILLER Athena Technologies, Inc.		12. TOTAL SAMPLES DISTURBED 1 UNDISTURBED (UD) 0		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES 0		
6. THICKNESS OF OVERBURDEN N/A		14. ELEVATION GROUND WATER		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING STARTED 10-11-10 COMPLETED 10-11-10		
8. TOTAL DEPTH OF BORING 10.2 Ft.		16. ELEVATION TOP OF BORING -10.5 Ft.		
		17. TOTAL RECOVERY FOR BORING 86 %		
		18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer		

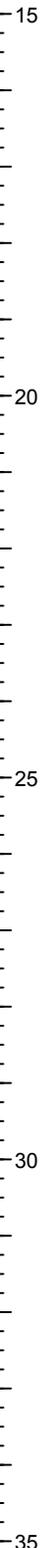
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-10.5	0.0		SAND, poorly-graded, mostly medium to coarse-grained sand-sized shell, some fine gravel-sized shell, few fine-grained sand-sized quartz, 10YR 6/1 gray (SP)	100			-10.5 Vibracore		0
-13.0	2.5		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace fine gravel-sized shell, 10YR 8/1 white (SP)		1		-12.0		
-15.4	4.9		SAND, poorly-graded, mostly fine to coarse-grained sand-sized shell, some fine-grained sand-sized quartz, 10YR 6/1 gray (SP)	84			Vibracore		5
-18.3	7.8		SAND, clayey, mostly fine-grained sand-sized quartz, some medium to coarse-grained sand-sized shell, little clay, few fine gravel-sized shell up to 1/2", 10YR 5/1 gray (SC)						
-19.3	8.8								
-20.7	10.2	N/R					-20.7		10
NOTES:									
1. Soils are field visually classified in accordance with the Unified Soils Classification System.									
2. Laboratory Testing Results									
SAMPLE ID			SAMPLE DEPTH			LABORATORY CLASSIFICATION			
-----			-----			-----			
1			1.5/2.0			SP*			
*Lab visual classification based on gradation curve. No Atterberg limits.									

Boring Designation VB-LBP10-7

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District		SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass			9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-LBP10-7		LOCATION COORDINATES X = 432,297 Y = 1,131,001		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)	HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAJ		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
4. NAME OF DRILLER Athena Technologies, Inc.			12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			DEG. FROM VERTICAL	BEARING	UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A			13. TOTAL NUMBER CORE BOXES 0		
7. DEPTH DRILLED INTO ROCK N/A			14. ELEVATION GROUND WATER		
8. TOTAL DEPTH OF BORING 12.5 Ft.			15. DATE BORING		STARTED 10-12-10
			16. ELEVATION TOP OF BORING -8.5 Ft.		COMPLETED 10-12-10
			17. TOTAL RECOVERY FOR BORING 86 %		
			18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-8.5	0.0		SAND, poorly-graded, mostly medium to coarse-grained sand-sized shell, little fine gravel-sized shell up to 3/4", few fine-grained sand-sized quartz, 10YR 6/1 gray (SP)	100			-8.5 Vibracore		0
					1		-10.5 Vibracore		
			At El. -12.0 Ft., little fine-grained sand-sized quartz, trace silt	100	2-Post		-12.5 -12.5 Vibracore		
				79			Vibracore		5
-19.2	10.7								10
		NIP							
-21.0	12.5						-21.0		15
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results						

DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS				
			PROJECT Vibracore Borings GIWW/Vicinity of			COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW		
LOCATION COORDINATES X = 432,297 Y = 1,131,001			ELEVATION TOP OF BORING -8.5 Ft.								
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS			% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION						
			1	2.0/2.5	SW*						
			2	4.0/4.5	SW*						
			2-Post	4.0/4.5	SP*						
			*Lab visual classification based on gradation curve. No Atterberg limits.								

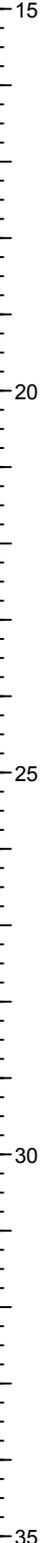


Boring Designation VB-LBP10-8

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass		9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-LBP10-8		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAJ		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER		
4. NAME OF DRILLER Athena Technologies, Inc.		12. TOTAL SAMPLES DISTURBED: 2 UNDISTURBED (UD): 0		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES 0		
6. THICKNESS OF OVERBURDEN N/A		14. ELEVATION GROUND WATER		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING STARTED: 10-11-10 COMPLETED: 10-11-10		
8. TOTAL DEPTH OF BORING 10.5 Ft.		16. ELEVATION TOP OF BORING -5.6 Ft.		
		17. TOTAL RECOVERY FOR BORING 89 %		
		18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE									
-5.6	0.0	[Dotted pattern]	SAND, poorly-graded, mostly fine-grained sand-sized quartz, some medium to coarse-grained sand-sized shell, few fine gravel-sized shell, 10YR 7/1 light gray (SP)	100			-5.6		0									
					1			-8.6										
-10.6	5.0	[Vertical lines]	SAND, silty, some fine-grained sand-sized quartz, little medium to coarse-grained sand-sized shell, little silt, few fine gravel-sized shell, 10YR 7/1 light gray (SM)	100			Vibracore		5									
					2			-11.6										
-14.9	9.3	NR		73			Vibracore											
								-16.1		10								
-16.1	10.5																	
NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>SAMPLE ID</th> <th>SAMPLE DEPTH</th> <th>LABORATORY CLASSIFICATION</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3.0/3.5</td> <td>SP*</td> </tr> <tr> <td>2</td> <td>6.0/6.5</td> <td>SM*</td> </tr> </tbody> </table>										SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION	1	3.0/3.5	SP*	2	6.0/6.5	SM*
SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION																
1	3.0/3.5	SP*																
2	6.0/6.5	SM*																

DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS		
			PROJECT Vibracore Borings GIWW/Vicinity of		COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW	
LOCATION COORDINATES X = 431,441 Y = 1,130,530			ELEVATION TOP OF BORING -5.6 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			*Lab visual classification based on gradation curve. No Atterberg limits.						

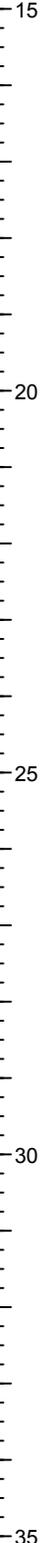


Boring Designation VB-LBP10-9

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass		9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-LBP10-9		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAJ		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER		
4. NAME OF DRILLER Athena Technologies, Inc.		12. TOTAL SAMPLES DISTURBED: 2 UNDISTURBED (UD): 0		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES 0		
6. THICKNESS OF OVERBURDEN N/A		14. ELEVATION GROUND WATER		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING STARTED: 10-11-10 COMPLETED: 10-11-10		
8. TOTAL DEPTH OF BORING 10.0 Ft.		16. ELEVATION TOP OF BORING -5.3 Ft.		
		17. TOTAL RECOVERY FOR BORING 94 %		
		18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE										
-5.3	0.0						-5.3												
-6.3	1.0	[Symbol]	SAND, poorly-graded, mostly fine-grained sand-sized quartz, little fine to coarse-grained sand-sized shell, 10YR 8/1 white (SP)	100			Vibracore												
-8.3	3.0		SAND, poorly-graded, mostly fine to coarse-grained sand-sized shell, some fine-grained sand-sized quartz, 10YR 7/1 light gray (SP)																
-9.3	4.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, few medium to coarse-grained sand-sized shell (SP)	100	1		Vibracore												
-11.3	6.0		SAND, poorly-graded, mostly fine to coarse-grained sand-sized shell, some fine-grained sand-sized quartz (SP)																
-13.6	8.3	[Symbol]	SAND, poorly-graded, mostly fine-grained sand-sized quartz, few medium to coarse-grained sand-sized shell, trace silt (SP)	83			Vibracore												
-14.7	9.4		SAND, poorly-graded, mostly fine to coarse-grained sand-sized shell, some fine-grained sand-sized quartz (SP)																
-15.3	10.0	NR					-15.3												
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results <table border="1"> <thead> <tr> <th>SAMPLE ID</th> <th>SAMPLE DEPTH</th> <th>LABORATORY CLASSIFICATION</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3.5/4.0</td> <td>SP*</td> </tr> <tr> <td>2</td> <td>6.5/7.0</td> <td>SP*</td> </tr> </tbody> </table> *Lab visual classification based on gradation	SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION	1	3.5/4.0	SP*	2	6.5/7.0	SP*							
SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION																	
1	3.5/4.0	SP*																	
2	6.5/7.0	SP*																	

DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS		
			PROJECT Vibracore Borings GIWW/Vicinity of		COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW	
LOCATION COORDINATES X = 430,686 Y = 1,129,853			ELEVATION TOP OF BORING -5.3 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			curve. No Atterberg limits.						

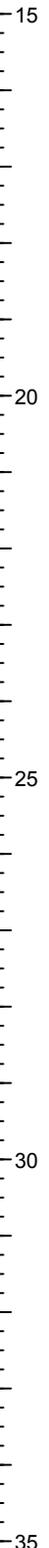


Boring Designation VB-LBP10-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass		9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-LBP10-10		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAJ		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER		
4. NAME OF DRILLER Athena Technologies, Inc.		12. TOTAL SAMPLES DISTURBED: 4 UNDISTURBED (UD): 0		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES 0		
6. THICKNESS OF OVERBURDEN N/A		14. ELEVATION GROUND WATER		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING STARTED: 10-11-10 COMPLETED: 10-11-10		
8. TOTAL DEPTH OF BORING 12.2 Ft.		16. ELEVATION TOP OF BORING -5.5 Ft.		
		17. TOTAL RECOVERY FOR BORING 86 %		
		18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-5.5	0.0						-5.5		
-7.5	2.0	[Dotted Pattern]	SAND, poorly-graded, mostly fine-grained sand-sized quartz, little fine to coarse-grained sand-sized shell, 10YR 8/1 white (SP)	100			Vibracore		
-8.5			SAND, poorly-graded, mostly medium to coarse-grained sand-sized shell, some fine-grained sand-sized quartz, few fine gravel-sized shell (SP)	100	1		Vibracore		
-11.0	5.5		SAND, poorly-graded, mostly fine-grained sand-sized quartz, little medium to coarse-grained sand-sized shell (SP)	100	2-Post	2	Vibracore		
-14.5			At El. -13.3 Ft., few medium to coarse-grained sand-sized shell, trace silt	100	3		Vibracore		
-16.0	10.5			47			Vibracore		
-17.7	12.2	NR					-17.7		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results						

DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS				
			PROJECT Vibracore Borings GIWW/Vicinity of			COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW		
LOCATION COORDINATES X = 429,832 Y = 1,129,266			ELEVATION TOP OF BORING -5.5 Ft.								
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS			% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION						
			1	3.0/3.5	SP*						
			2	6.0/6.5	SP*						
			2-Post	6.0/6.5	SP*						
			3	9.0/9.5	SP*						
			*Lab visual classification based on gradation curve. No Atterberg limits.								

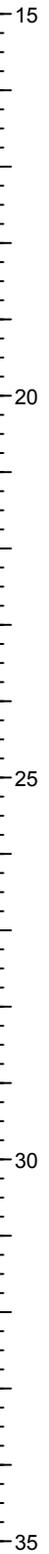


Boring Designation VB-LBP10-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass		9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-LBP10-11		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAJ		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER		
4. NAME OF DRILLER Athena Technologies, Inc.		12. TOTAL SAMPLES DISTURBED: 2 UNDISTURBED (UD): 0		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES 0		
6. THICKNESS OF OVERBURDEN N/A		14. ELEVATION GROUND WATER		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING STARTED: 10-11-10 COMPLETED: 10-11-10		
8. TOTAL DEPTH OF BORING 10.8 Ft.		16. ELEVATION TOP OF BORING -8.0 Ft.		
		17. TOTAL RECOVERY FOR BORING 100 %		
		18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-8.0	0.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, few medium to coarse-grained sand-sized shell, trace silt, 10YR 8/1 white (SP)	100			-8.0 Vibracore		0
					1		-10.0 Vibracore		
			At El. -12.0 Ft., some medium to coarse-grained sand-sized shell, some fine-grained sand-sized quartz, few fine to coarse gravel-sized shell	99	2		-13.0 Vibracore		5
-18.7	10.8						-18.7		10
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results						
			SAMPLE ID SAMPLE DEPTH LABORATORY CLASSIFICATION						
			1 2.0/2.5 SP*						
			2 5.0/5.5 SP*						

DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS		
			PROJECT Vibracore Borings GIWW/Vicinity of			COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW
LOCATION COORDINATES X = 429,361 Y = 1,128,843			ELEVATION TOP OF BORING -8.0 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			*Lab visual classification based on gradation curve. No Atterberg limits.						



DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District		SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass			9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-GIWWW4-10-1		LOCATION COORDINATES X = 443,579 Y = 1,122,896		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)	HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAJ		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
4. NAME OF DRILLER Athena Technologies, Inc.			12. TOTAL SAMPLES		DISTURBED 1
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			DEG. FROM VERTICAL	BEARING	UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A			13. TOTAL NUMBER CORE BOXES 0		
7. DEPTH DRILLED INTO ROCK N/A			14. ELEVATION GROUND WATER		
8. TOTAL DEPTH OF BORING 13.0 Ft.			15. DATE BORING		STARTED 10-11-10
			16. ELEVATION TOP OF BORING -7.2 Ft.		COMPLETED 10-11-10
			17. TOTAL RECOVERY FOR BORING 89 %		
			18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-7.2	0.0		SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, few medium to coarse-grained sand-sized shell, few silt, trace fine gravel-sized shell up to 1/2", 10YR 7/1 light gray (SP-SM) At El. -7.6 Ft., little fine to coarse-grained sand-sized shell, 10YR 4/1 dark gray	100			Vibracore		
			At El. -11.8 Ft., 10YR 5/1 gray		1				
-13.7	6.5		SAND, silty, mostly fine-grained sand-sized quartz, some medium to coarse-grained sand-sized shell, little silt, few fine to coarse gravel-sized shell up to 1", 10YR 7/1 light gray (SM)	88			Vibracore		
-18.8	11.6								
-20.2	13.0	NR							
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.						

DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS											
			PROJECT Vibracore Borings GIWW/Vicinity of		COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW										
LOCATION COORDINATES X = 443,579 Y = 1,122,896			ELEVATION TOP OF BORING -7.2 Ft.															
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE									
			2. Laboratory Testing Results <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 15%; text-align: center;">SAMPLE ID</td> <td style="width: 15%; text-align: center;">SAMPLE DEPTH</td> <td style="width: 70%; text-align: center;">LABORATORY CLASSIFICATION</td> </tr> <tr> <td style="text-align: center;">-----</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">1.5/2.0</td> <td style="text-align: center;">SP-SM*</td> </tr> </table> <p>*Lab visual classification based on gradation curve. No Atterberg limits.</p>	SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION	-----			1	1.5/2.0	SP-SM*						
SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION																

1	1.5/2.0	SP-SM*																

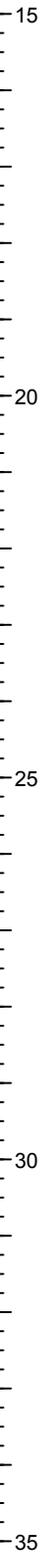
15
20
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30
35

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District		SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass			9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-GIWWW4-10-2		LOCATION COORDINATES X = 444,243 Y = 1,122,322		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)	HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAJ		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
4. NAME OF DRILLER Athena Technologies, Inc.			12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			DEG. FROM VERTICAL	BEARING	UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A			13. TOTAL NUMBER CORE BOXES 0		14. ELEVATION GROUND WATER
7. DEPTH DRILLED INTO ROCK N/A			15. DATE BORING		STARTED 10-12-10
8. TOTAL DEPTH OF BORING 10.5 Ft.			16. ELEVATION TOP OF BORING -7.0 Ft.		COMPLETED 10-12-10
			17. TOTAL RECOVERY FOR BORING 93 %		18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-7.0	0.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace medium-grained sand-sized shell, trace silt, 10YR 7/1 light gray (SP)	100			-7.0 Vibracore		
			At El. -9.3 Ft., little medium to coarse-grained sand-sized shell, little fine gravel-sized shell, trace silt, 10YR 4/1 dark gray	100	1		-8.5 Vibracore		
					2		-10.5		
-13.1	6.1		SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, few silt, 10YR 5/1 gray (SP-SM)	90			Vibracore		
-15.0	8.0		SAND, silty, mostly fine-grained sand-sized quartz, some medium to coarse-grained sand-sized shell, few fine gravel-sized shell, few silt, 10YR 7/1 light gray (SM)						
-16.8	9.8								
-17.5	10.5	NIP					-17.5		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results						
			SAMPLE ID SAMPLE DEPTH LABORATORY CLASSIFICATION						

			1 1.5/2.0 SP*						
			2 3.5/4.0 SP*						

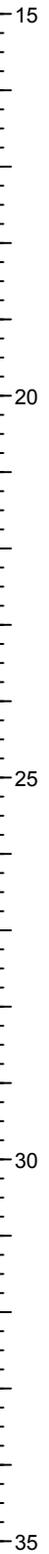
DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS		
			PROJECT Vibracore Borings GIWW/Vicinity of		COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83		VERTICAL MLLW
LOCATION COORDINATES X = 444,243 Y = 1,122,322			ELEVATION TOP OF BORING -7.0 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			*Lab visual classification based on gradation curve. No Atterberg limits.						



DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District		SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass			9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-GIWWW4-10-3		LOCATION COORDINATES X = 444,898 Y = 1,121,796		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)	HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAJ		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
4. NAME OF DRILLER Athena Technologies, Inc.			12. TOTAL SAMPLES		DISTURBED 1
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			DEG. FROM VERTICAL	BEARING	UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A			13. TOTAL NUMBER CORE BOXES 0		14. ELEVATION GROUND WATER
7. DEPTH DRILLED INTO ROCK N/A			15. DATE BORING		STARTED 10-12-10
8. TOTAL DEPTH OF BORING 10.5 Ft.			16. ELEVATION TOP OF BORING -7.3 Ft.		COMPLETED 10-12-10
			17. TOTAL RECOVERY FOR BORING 93 %		18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE						
-7.3	0.0		SAND, poorly-graded with silt, mostly fine to medium-grained sand-sized quartz, some fine to coarse-grained sand-sized shell, few silt, 10YR 7/1 light gray (SP-SM) At El. -8.2 Ft., mostly fine-grained sand-sized quartz, little medium to coarse-grained sand-sized shell, few fine gravel-sized shell up to 1/2", 10YR 5/1 gray	100			-7.3 Vibracore		0						
			At El. -13.6 Ft., trace sand to gravel-sized shell up to 1/2", 10YR 4/1 dark gray	92	1		-9.3 Vibracore		5						
-15.8	8.5		SAND, silty, mostly fine to medium-grained sand-sized quartz, some medium to coarse-grained sand-sized shell, little silt, few fine gravel-sized shell up to 1/2", 10YR 7/1 light gray (SM)						10						
-17.1	9.8														
-17.8	10.5	N/R					-17.8								
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. Laboratory Testing Results</p> <table border="1"> <thead> <tr> <th>SAMPLE ID</th> <th>SAMPLE DEPTH</th> <th>LABORATORY CLASSIFICATION</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2.0/2.5</td> <td>SP-SM*</td> </tr> </tbody> </table> <p>*Lab visual classification based on gradation</p>										SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION	1	2.0/2.5	SP-SM*
SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION													
1	2.0/2.5	SP-SM*													

DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS		
			PROJECT Vibracore Borings GIWW/Vicinity of		COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW	
LOCATION COORDINATES X = 444,898 Y = 1,121,796			ELEVATION TOP OF BORING -7.3 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			curve. No Atterberg limits.						



DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District		SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass			9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-GIWWW5-10-1		LOCATION COORDINATES X = 437,588 Y = 1,128,226		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)	
3. DRILLING AGENCY Corps of Engineers - CESAJ		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
4. NAME OF DRILLER Athena Technologies, Inc.			12. TOTAL SAMPLES		DISTURBED 1 UNDISTURBED (UD) 0
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			DEG. FROM VERTICAL		BEARING
6. THICKNESS OF OVERBURDEN N/A			13. TOTAL NUMBER CORE BOXES 0		14. ELEVATION GROUND WATER
7. DEPTH DRILLED INTO ROCK N/A			15. DATE BORING		STARTED 10-11-10 COMPLETED 10-11-10
8. TOTAL DEPTH OF BORING 11.8 Ft.			16. ELEVATION TOP OF BORING -7.8 Ft.		17. TOTAL RECOVERY FOR BORING 87 %
18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer					

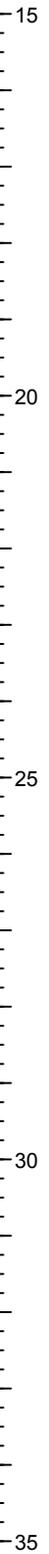
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-7.8	0.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace fine-grained sand-sized shell, 10YR 7/1 light gray (SP)	100			-7.8 Vibracore		0
			At El. -11.8 Ft., 10YR 6/1 gray		1		-9.8		
			At El. -14.0 Ft., little fine to coarse-grained sand-sized shell	85			Vibracore		5
-15.8	8.0		SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, little fine to coarse-grained sand-sized shell, few silt, 10YR 6/1 gray (SP-SM)						10
-18.1	10.3								
-19.6	11.8	NR					-19.6		
NOTES:									
1. Soils are field visually classified in accordance with the Unified Soils Classification System.									
2. Laboratory Testing Results									
SAMPLE	SAMPLE	LABORATORY							

Boring Designation VB-GIWWW5-10-2

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District		SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass			9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-GIWWW5-10-2		LOCATION COORDINATES X = 437,120 Y = 1,129,250		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)	
3. DRILLING AGENCY Corps of Engineers - CESAJ		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
4. NAME OF DRILLER Athena Technologies, Inc.			12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			DEG. FROM VERTICAL		BEARING
6. THICKNESS OF OVERBURDEN N/A			13. TOTAL NUMBER CORE BOXES 0		UNDISTURBED (UD) 0
7. DEPTH DRILLED INTO ROCK N/A			14. ELEVATION GROUND WATER		
8. TOTAL DEPTH OF BORING 11.7 Ft.			15. DATE BORING		STARTED 10-11-10
			16. ELEVATION TOP OF BORING -7.1 Ft.		COMPLETED 10-11-10
			17. TOTAL RECOVERY FOR BORING 89 %		
			18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-7.1	0.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace fine-grained sand-sized shell, 10YR 7/1 light gray (SP)	100			-7.1 Vibracore		0
					1		-8.6 Vibracore		
				100			-11.1 Vibracore		5
				83	2		Vibracore		10
-16.9	9.8								
-17.5	10.4		SAND, poorly-graded, mostly fine to coarse-grained sand-sized shell, some fine to medium-grained sand-sized quartz, 10YR 6/1 gray (SP)						
-18.8	11.7	NR					-18.8		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results						
SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION							

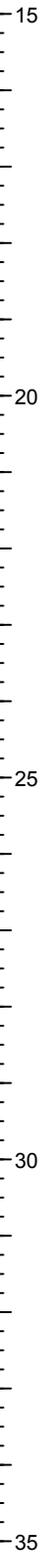
DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District			SHEET 2 OF 2 SHEETS			
PROJECT Vibracore Borings GIWW/Vicinity of			COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW			
LOCATION COORDINATES X = 437,120 Y = 1,129,250			ELEVATION TOP OF BORING -7.1 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
			1 1.5/2.0 SP* 2 4.0/4.5 SP* *Lab visual classification based on gradation curve. No Atterberg limits.						



DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District		SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass			9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-GIWWW5-10-3		LOCATION COORDINATES X = 436,263 Y = 1,131,344		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)	
3. DRILLING AGENCY Corps of Engineers - CESAJ		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
4. NAME OF DRILLER Athena Technologies, Inc.			12. TOTAL SAMPLES		DISTURBED 2 UNDISTURBED (UD) 0
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			DEG. FROM VERTICAL		BEARING
6. THICKNESS OF OVERBURDEN N/A			13. TOTAL NUMBER CORE BOXES 0		14. ELEVATION GROUND WATER
7. DEPTH DRILLED INTO ROCK N/A			15. DATE BORING		STARTED 10-12-10 COMPLETED 10-12-10
8. TOTAL DEPTH OF BORING 11.7 Ft.			16. ELEVATION TOP OF BORING -8.9 Ft.		17. TOTAL RECOVERY FOR BORING 89 %
18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer					

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-8.9	0.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace fine-grained sand-sized shell, 10YR 7/1 light gray (SP)	100			-8.9 Vibracore		0
			At El. -13.2 Ft., 3" Limestone fragment				-10.9 -10.9 Vibracore		
-15.5	6.6		SAND, poorly-graded with silt, mostly fine to medium-grained sand-sized quartz, little fine to coarse-grained sand-sized shell, few silt, 10YR 6/1 gray (SP-SM)	87			Vibracore		
-19.3	10.4								10
-20.6	11.7	NR					-20.6		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results						
			SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION				

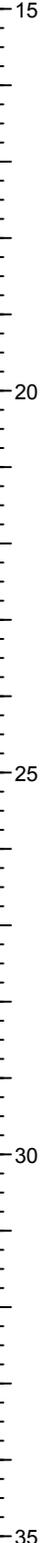
DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District			SHEET 2 OF 2 SHEETS			
PROJECT Vibracore Borings GIWW/Vicinity of			COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW			
LOCATION COORDINATES X = 436,263 Y = 1,131,344			ELEVATION TOP OF BORING -8.9 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
			1 2.0/2.5 SP* 1-Post 2.0/2.5 SP* *Lab visual classification based on gradation curve. No Atterberg limits.						



DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass		9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-GIWWW5-10-4		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAJ		11. MANUFACTURER'S DESIGNATION OF DRILL		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Athena Technologies, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. ELEVATION GROUND WATER		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 10-12-10
8. TOTAL DEPTH OF BORING 11.0 Ft.		16. ELEVATION TOP OF BORING -7.1 Ft.		COMPLETED 10-12-10
		17. TOTAL RECOVERY FOR BORING 88 %		
		18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-7.1	0.0						-7.1		
-8.1	1.0	Highly Weathered	SAND, poorly-graded with silt, mostly fine to medium-grained sand-sized quartz, some medium to coarse-grained sand-sized shell, few silt, few fine gravel-sized shell, 10YR 4/1 dark gray (SP-SM)	100	1		-7.6		
			LIMESTONE, highly weathered, 10YR 5/1 gray	100					
-10.0	2.9		SAND, poorly-graded, mostly fine-grained sand-sized quartz, few medium to coarse-grained sand-sized shell, trace silt, trace fine gravel-sized shell, 10YR 6/1 gray (SP)		2		-10.1		
-16.8	9.7			84					
-18.1	11.0	NIP					-18.1		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results						
			SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION				
			1	0.5/1.0	SP-SM*				

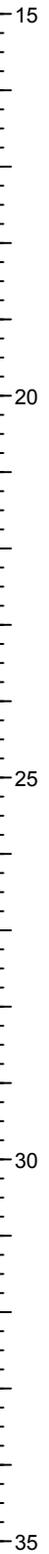
DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District			SHEET 2 OF 2 SHEETS			
PROJECT Vibracore Borings GIWW/Vicinity of			COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW			
LOCATION COORDINATES X = 436,082 Y = 1,131,882			ELEVATION TOP OF BORING -7.1 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
			2 3.0/3.5 SP*						
			*Lab visual classification based on gradation curve. No Atterberg limits.						



DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass			9. SIZE AND TYPE OF BIT 3.5" Vibracore	
2. BORING DESIGNATION VB-GIWWW5-10-5		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAJ		11. MANUFACTURER'S DESIGNATION OF DRILL		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Athena Technologies, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. ELEVATION GROUND WATER		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 10-13-10
8. TOTAL DEPTH OF BORING 11.0 Ft.		16. ELEVATION TOP OF BORING		COMPLETED 10-13-10
		17. TOTAL RECOVERY FOR BORING		-3.9 Ft.
		18. SIGNATURE AND TITLE OF INSPECTOR		89 %
				Daniel G. Blaydes, Geotechnical Engineer

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-3.9	0.0						-3.9		
-5.4	1.5		SAND, poorly-graded, mostly fine-grained sand-sized quartz, few fine to coarse-grained sand-sized shell, trace silt, 10YR 6/1 gray (SP)	100			Vibracore		
-8.4	4.5		SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, few silt, 10YR 6/1 gray (SP-SM)	100	1		Vibracore		
-9.9	6.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, little medium to coarse-grained sand-sized shell, little fine gravel-sized shell up to 1/2", trace silt, 10YR 5/1 gray (SP)	80	2		Vibracore		
-13.7	9.8		SAND, silty, mostly fine to medium-grained sand-sized quartz, little sand to gravel-sized shell up to 1/2", little silt, 10YR 5/1 gray (SM)				Vibracore		
-14.9	11.0	NR					-14.9		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results						
			SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION				
			1	2.5/3.0	SP-SM*				

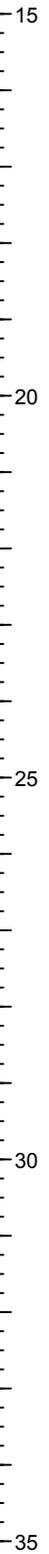
DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS		
			PROJECT Vibracore Borings GIWW/Vicinity of		COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW	
LOCATION COORDINATES X = 437,298 Y = 1,128,600			ELEVATION TOP OF BORING -3.9 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
			2 5.0/5.5 SP* *Lab visual classification based on gradation curve. No Atterberg limits.						



DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass			9. SIZE AND TYPE OF BIT 3.5" Vibracore	
2. BORING DESIGNATION VB-GIWWW7-10-1		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAJ		11. MANUFACTURER'S DESIGNATION OF DRILL		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Athena Technologies, Inc.		12. TOTAL SAMPLES		DISTURBED 3 UNDISTURBED (UD) 0
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		LOCATION COORDINATES X = 430,766 Y = 1,143,388	13. TOTAL NUMBER CORE BOXES 0	
6. THICKNESS OF OVERBURDEN N/A		DEG. FROM VERTICAL	14. ELEVATION GROUND WATER	
7. DEPTH DRILLED INTO ROCK N/A		BEARING	15. DATE BORING STARTED 10-12-10 COMPLETED 10-12-10	
8. TOTAL DEPTH OF BORING 11.4 Ft.		16. ELEVATION TOP OF BORING -5.0 Ft.		17. TOTAL RECOVERY FOR BORING 92 %
18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE						
-5.0	0.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, some fine to coarse-grained sand-sized shell, 10YR 7/1 light gray (SP)	100			-5.0 Vibracore		0						
			At El. -6.5 Ft., little medium-grained sand-sized shell, trace silt	100	-Post 1		-7.0 Vibracore								
			At El. -8.5 Ft., trace fine to medium-grained sand-sized shell	100			-9.0 Vibracore		5						
			At El. -12.2 Ft., 3" layer of 10yr 6/1 gray (SM)	88	2		Vibracore								
-13.5	8.5		SAND, silty, mostly fine-grained sand-sized quartz, some silt, 10YR 5/1 gray (SM)						10						
-15.5	10.5														
-16.4	11.4	N/R					-16.4								
NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results <table border="1"> <tr> <td>SAMPLE ID</td> <td>SAMPLE DEPTH</td> <td>LABORATORY CLASSIFICATION</td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>										SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION			
SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION													

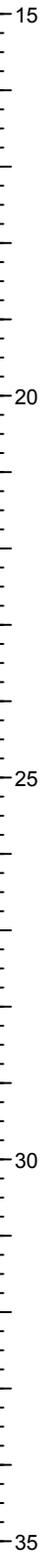
DRILLING LOG (Cont. Sheet)			INSTALLATION			SHEET 2 OF 2 SHEETS					
PROJECT Vibracore Borings GIWW/Vicinity of			COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW					
LOCATION COORDINATES X = 430,766 Y = 1,143,388			ELEVATION TOP OF BORING -5.0 Ft.								
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS			% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			1	2.0/2.5	SP*						
			1-Post	2.0/2.5	SP*						
			2	4.0/4.5	SP*						
			*Lab visual classification based on gradation curve. No Atterberg limits.								



DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass		9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-GIWWW7-10-2		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAJ		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER		
4. NAME OF DRILLER Athena Technologies, Inc.		12. TOTAL SAMPLES DISTURBED: 1 UNDISTURBED (UD): 0		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES 0		
6. THICKNESS OF OVERBURDEN N/A		14. ELEVATION GROUND WATER		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING STARTED: 10-12-10 COMPLETED: 10-12-10		
8. TOTAL DEPTH OF BORING 11.0 Ft.		16. ELEVATION TOP OF BORING -9.4 Ft.		
		17. TOTAL RECOVERY FOR BORING 89 %		
		18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-9.4	0.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace fine-grained sand-sized shell, 10YR 6/1 gray (SP)	100	1		-9.4 Vibracore		0
-12.3	2.9		SAND, silty, mostly fine-grained sand-sized quartz, some silt, few fine to medium-grained sand-sized shell, 10YR 5/1 gray (SM)	89			Vibracore		5
-15.7	6.3		SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, few silt, 10YR 7/1 light gray (SP-SM)						
-19.2	9.8								
-20.4	11.0	NR					-20.4		10
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results						
			SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION				
			1	0.5/1.0	SP*				

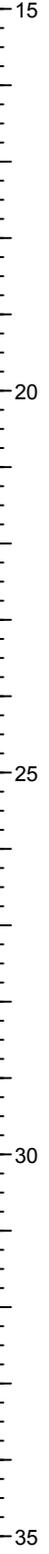
DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS		
			PROJECT Vibracore Borings GIWW/Vicinity of		COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW	
LOCATION COORDINATES X = 430,587 Y = 1,144,165			ELEVATION TOP OF BORING -9.4 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			*Lab visual classification based on gradation curve. No Atterberg limits.						



DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass		9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-GIWWW7-10-3		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAJ		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER		
4. NAME OF DRILLER Athena Technologies, Inc.		12. TOTAL SAMPLES DISTURBED: 1 UNDISTURBED (UD): 0		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES 0		
6. THICKNESS OF OVERBURDEN N/A		14. ELEVATION GROUND WATER		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING STARTED: 10-12-10 COMPLETED: 10-12-10		
8. TOTAL DEPTH OF BORING 11.0 Ft.		16. ELEVATION TOP OF BORING -9.7 Ft.		
		17. TOTAL RECOVERY FOR BORING 89 %		
		18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-9.7	0.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, few fine to medium-grained sand-sized shell, trace silt, 10YR 6/1 gray (SP)	100	1		-9.7 Vibracore		0
-12.7	3.0		SAND, silty, mostly fine-grained sand-sized quartz, some medium to coarse-grained sand-sized shell, little silt, few fine gravel-sized shell up to 1/2", 10YR 5/1 gray (SM) At El. -15.2 Ft., few fine to coarse-grained sand-sized shell	89			Vibracore		5
-18.2	8.5		SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, little fine to coarse-grained sand-sized shell, few silt, 10YR 6/1 gray (SP-SM)						10
-19.5	9.8								
-20.7	11.0	NR					-20.7		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results						
			SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION				
			1	0.5/1.0	SP*				

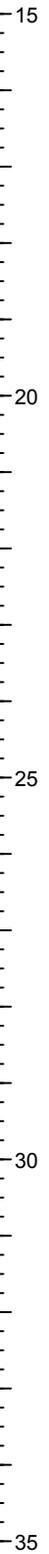
DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS		
			PROJECT Vibracore Borings GIWW/Vicinity of		COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW	
LOCATION COORDINATES X = 430,161 Y = 1,145,657			ELEVATION TOP OF BORING -9.7 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			*Lab visual classification based on gradation curve. No Atterberg limits.						



DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District		SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass			9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-GIWWW12-10-1		LOCATION COORDINATES X = 430,825 Y = 1,158,205		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)	HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAJ		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
4. NAME OF DRILLER Athena Technologies, Inc.			12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			DEG. FROM VERTICAL	BEARING	UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A			13. TOTAL NUMBER CORE BOXES 0		14. ELEVATION GROUND WATER
7. DEPTH DRILLED INTO ROCK N/A			15. DATE BORING		STARTED 10-12-10
8. TOTAL DEPTH OF BORING 11.5 Ft.			16. ELEVATION TOP OF BORING -5.4 Ft.		COMPLETED 10-12-10
			17. TOTAL RECOVERY FOR BORING 96 %		18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-5.4	0.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace fine-grained sand-sized shell, trace silt, 10YR 7/1 light gray (SP)	100			-5.4 Vibracore		0
				100	-Post 1		-7.4 -7.4 Vibracore		
			At El. -8.6 Ft., 1.5" layer of (SM)	100			Vibracore		
-9.2	3.8								
-9.9	4.5		SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, few medium to coarse-grained sand-sized shell, few silt, trace fine gravel-sized shell, 10YR 7/1 light gray (SP-SM)		2		-9.4		5
-11.3	5.9		SAND, silty, mostly fine-grained sand-sized quartz, little silt, few fine to medium-grained sand-sized shell, 10YR 4/1 dark gray (SM)						
			SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, some sand to gravel-sized shell up to 3/4", few silt, 10YR 6/1 gray (SP-SM)	93			Vibracore		10
-16.4	11.0								
-16.9	11.5	NR					-16.9		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results						
			SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION				

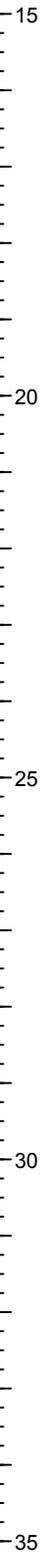
DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS		
			PROJECT Vibracore Borings GIWW/Vicinity of			COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW
LOCATION COORDINATES X = 430,825 Y = 1,158,205			ELEVATION TOP OF BORING -5.4 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
			1 2.0/2.5 SP* 1-Post 2.0/2.5 SP* 2 4.0/4.5 SP-SM* *Lab visual classification based on gradation curve. No Atterberg limits.						



DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass		9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-GIWWW13-10-1		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAJ		11. MANUFACTURER'S DESIGNATION OF DRILL		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Athena Technologies, Inc.		12. TOTAL SAMPLES		DISTURBED 1
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. ELEVATION GROUND WATER		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 10-12-10
8. TOTAL DEPTH OF BORING 11.0 Ft.		16. ELEVATION TOP OF BORING		COMPLETED 10-12-10
		17. TOTAL RECOVERY FOR BORING		-9.4 Ft.
		18. SIGNATURE AND TITLE OF INSPECTOR		92 %
				Daniel G. Blaydes, Geotechnical Engineer

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-9.4	0.0						-9.4		
			SAND, poorly-graded, mostly fine-grained sand-sized quartz, little medium to coarse-grained sand-sized shell, trace silt, trace fine gravel-sized shell, 10YR 6/1 gray (SP)	100	1		Vibracore		
-13.4	4.0		SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, little fine to medium-grained sand-sized shell, 10YR 4/1 dark gray (SM)						
-14.8	5.4		CLAY, fat, high plasticity, soft, little fine to medium-grained sand-sized quartz, 10YR 8/1 white (CH)	91			Vibracore		
-16.4	7.0								
			SAND, clayey, mostly fine to medium-grained sand-sized quartz, some clay, few medium to coarse-grained sand-sized shell, trace fine gravel-sized shell up to 1/2", 10YR 7/1 light gray (SC)						
-19.5	10.1								
-20.4	11.0	N/R					-20.4		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results						
			SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION				
			1	0.5/1.0	SP*				

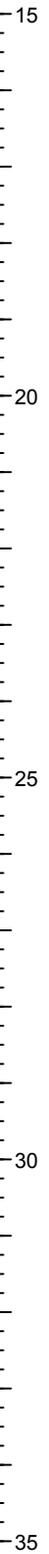
DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS		
			PROJECT Vibracore Borings GIWW/Vicinity of			COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW
LOCATION COORDINATES X = 429,178 Y = 1,161,031			ELEVATION TOP OF BORING -9.4 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			*Lab visual classification based on gradation curve. No Atterberg limits.						



DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District		SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass			9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-GIWWW14-10-1		LOCATION COORDINATES X = 428,548 Y = 1,162,955		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)	HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAJ		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
4. NAME OF DRILLER Athena Technologies, Inc.			12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			DEG. FROM VERTICAL	BEARING	UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A			13. TOTAL NUMBER CORE BOXES 0		
7. DEPTH DRILLED INTO ROCK N/A			14. ELEVATION GROUND WATER		
8. TOTAL DEPTH OF BORING 11.0 Ft.			15. DATE BORING		STARTED 10-12-10
			16. ELEVATION TOP OF BORING -5.1 Ft.		COMPLETED 10-12-10
			17. TOTAL RECOVERY FOR BORING 92 %		
			18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-5.1	0.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace fine to medium-grained sand-sized shell, 10YR 8/1 white (SP)	100			-5.1 Vibracore		0
					1		-7.1 Vibracore		
-9.6	4.5		At El. -8.9 Ft., little medium to coarse-grained sand-sized shell, trace fine gravel-sized shell, trace silt				-9.1		
-11.2	6.1		SAND, poorly-graded with silt, mostly fine to medium-grained sand-sized quartz, few silt, 10YR 6/1 gray (SP-SM)						5
			SAND, silty, mostly fine to medium-grained sand-sized quartz, little silt, few medium to coarse-grained sand-sized shell, few fine to coarse gravel-sized shell up to 1-1/2", 10YR 6/1 gray (SM)	87			Vibracore		
-15.2	10.1								10
-16.1	11.0	N/R					-16.1		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results						
			SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION				
			1	2.0/2.5	SP*				

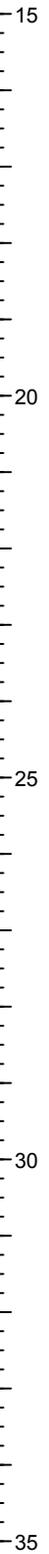
DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS		
			PROJECT Vibracore Borings GIWW/Vicinity of		COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83		VERTICAL MLLW
LOCATION COORDINATES X = 428,548 Y = 1,162,955			ELEVATION TOP OF BORING -5.1 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			2 4.0/4.5 SP*						
			*Lab visual classification based on gradation curve. No Atterberg limits.						



DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District		SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass			9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-GIWWSC2-10-1		LOCATION COORDINATES X = 438,080 Y = 1,200,802		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)	HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAJ		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
4. NAME OF DRILLER Athena Technologies, Inc.			12. TOTAL SAMPLES		DISTURBED 1
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			DEG. FROM VERTICAL	BEARING	UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A			13. TOTAL NUMBER CORE BOXES 0		
7. DEPTH DRILLED INTO ROCK N/A			14. ELEVATION GROUND WATER		
8. TOTAL DEPTH OF BORING 11.3 Ft.			15. DATE BORING		STARTED 10-12-10
			16. ELEVATION TOP OF BORING -7.5 Ft.		COMPLETED 10-12-10
			17. TOTAL RECOVERY FOR BORING 91 %		
			18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-7.5	0.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, few medium-grained sand-sized shell, trace silt, 10YR 7/1 light gray (SP)	100			-7.5 Vibracore		
					1		-9.0		
-12.8	5.3		SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, few fine to coarse-grained sand-sized shell, few silt, 10YR 6/1 gray (SP-SM)	90			Vibracore		
-17.8	10.3								
-18.8	11.3	NIR					-18.8		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results SAMPLE ID SAMPLE DEPTH LABORATORY CLASSIFICATION						

DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS		
			PROJECT Vibracore Borings GIWW/Vicinity of			COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW
LOCATION COORDINATES X = 438,080 Y = 1,200,802			ELEVATION TOP OF BORING -7.5 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
			1 1.5/2.0 SP* *Lab visual classification based on gradation curve. No Atterberg limits.						



DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District		SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass			9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-GIWWSC2-10-2		LOCATION COORDINATES X = 437,876 Y = 1,201,399		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)	HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAJ		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
4. NAME OF DRILLER Athena Technologies, Inc.			12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			DEG. FROM VERTICAL	BEARING	UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A			13. TOTAL NUMBER CORE BOXES 0		
7. DEPTH DRILLED INTO ROCK N/A			14. ELEVATION GROUND WATER		
8. TOTAL DEPTH OF BORING 12.2 Ft.			15. DATE BORING		STARTED 10-12-10
			16. ELEVATION TOP OF BORING -5.4 Ft.		COMPLETED 10-12-10
			17. TOTAL RECOVERY FOR BORING 100 %		
			18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer		

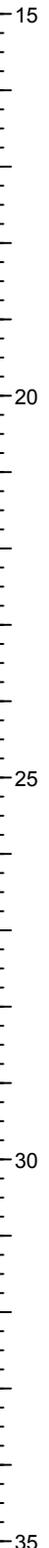
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-5.4	0.0		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little fine to coarse-grained sand-sized shell, trace silt, 10YR 8/1 white (SP)	100			-5.4 Vibracore		0
				100	-Post 1		-7.4 -7.4 Vibracore		
			At El. -8.9 Ft., mostly fine-grained sand-sized quartz, trace silt, trace medium-grained sand-sized shell	100			Vibracore		
					2		-9.4		5
-12.6	7.2		SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, few silt, 10YR 7/1 light gray (SP-SM)	100			Vibracore		
-13.5	8.1		SAND, silty, mostly fine-grained sand-sized quartz, little silt, 10YR 5/1 gray (SM)						
-17.6	12.2						-17.6		10
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results						15

DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS				
			PROJECT Vibracore Borings GIWW/Vicinity of			COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW		
LOCATION COORDINATES X = 437,876 Y = 1,201,399			ELEVATION TOP OF BORING -5.4 Ft.								
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS			% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
			SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION					15	
			1	2.0/2.5	SP*						
			1-Post	2.0/2.5	SP*						
			2	4.0/4.5	SP*						
			*Lab visual classification based on gradation curve. No Atterberg limits.								20
											25
											30
											35

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District		SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass			9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-GIWWSC3-10-1		LOCATION COORDINATES X = 434,901 Y = 1,221,024		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)	
3. DRILLING AGENCY Corps of Engineers - CESAJ		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER	
4. NAME OF DRILLER Athena Technologies, Inc.			12. TOTAL SAMPLES		DISTURBED 1
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED			DEG. FROM VERTICAL		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A			13. TOTAL NUMBER CORE BOXES 0		14. ELEVATION GROUND WATER
7. DEPTH DRILLED INTO ROCK N/A			15. DATE BORING		STARTED 10-12-10
8. TOTAL DEPTH OF BORING 10.5 Ft.			16. ELEVATION TOP OF BORING -9.0 Ft.		COMPLETED 10-12-10
			17. TOTAL RECOVERY FOR BORING 93 %		18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-9.0	0.0						-9.0		
			SAND, poorly-graded, mostly fine-grained sand-sized quartz, some medium to coarse-grained sand-sized shell, trace fine gravel-sized shell, trace silt, 10YR 6/1 gray (SP) At El. -10.0 Ft., few fine to coarse-grained sand-sized shell, 10YR 7/1 light gray	100	1		-9.5 Vibracore		0
				93			Vibracore		5
-16.8	7.8		SAND, poorly-graded, mostly fine to coarse-grained sand-sized shell, some fine to medium-grained sand-sized quartz, 10YR 6/1 gray (SP)						
-18.8	9.8								
-19.5	10.5	NIP					-19.5		10
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results						
			SAMPLE ID SAMPLE DEPTH LABORATORY CLASSIFICATION						
			----- 1 0.5/1.0 SP*						
			*Lab visual classification based on gradation						

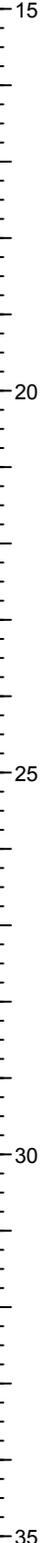
DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS		
			PROJECT Vibracore Borings GIWW/Vicinity of			COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW
LOCATION COORDINATES X = 434,901 Y = 1,221,024			ELEVATION TOP OF BORING -9.0 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			curve. No Atterberg limits.						



DRILLING LOG		DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2 SHEETS
1. PROJECT Vibracore Borings GIWW/Vicinity of Longboat Pass		9. SIZE AND TYPE OF BIT 3.5" Vibracore		
2. BORING DESIGNATION VB-GIWWSC3-10-2		10. COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAJ		11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER		
4. NAME OF DRILLER Athena Technologies, Inc.		12. TOTAL SAMPLES DISTURBED: 2 UNDISTURBED (UD): 0		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES 0		
6. THICKNESS OF OVERBURDEN N/A		14. ELEVATION GROUND WATER		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING STARTED: 10-12-10 COMPLETED: 10-12-10		
8. TOTAL DEPTH OF BORING 11.0 Ft.		16. ELEVATION TOP OF BORING -6.8 Ft.		
		17. TOTAL RECOVERY FOR BORING 89 %		
		18. SIGNATURE AND TITLE OF INSPECTOR Daniel G. Blaydes, Geotechnical Engineer		

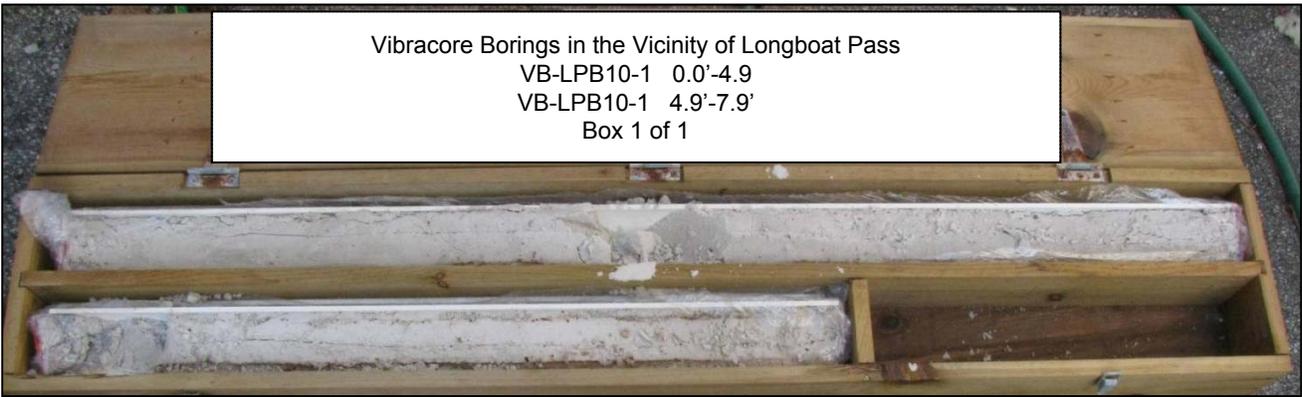
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE						
-6.8	0.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace medium-grained sand-sized shell, 10YR 6/1 gray (SP)	100			-6.8 Vibracore		0						
-9.1	2.3		SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, few silt, trace medium to coarse-grained sand-sized shell, 10YR 5/1 gray (SP-SM)	100	1		-7.8 Vibracore								
-11.6	4.8		LIMESTONE, decomposed, 10YR 5/1 gray		2		-9.8		5						
-12.4	5.6		SAND, silty, mostly fine-grained sand-sized quartz, little silt, little fine to coarse-grained sand-sized shell, 10YR 4/1 dark gray (SM)	85			Vibracore								
-16.6	9.8								10						
-17.8	11.0	NR					-17.8								
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. Laboratory Testing Results</p> <table border="1"> <thead> <tr> <th>SAMPLE ID</th> <th>SAMPLE DEPTH</th> <th>LABORATORY CLASSIFICATION</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1.0/1.5</td> <td>SP*</td> </tr> </tbody> </table>										SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION	1	1.0/1.5	SP*
SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION													
1	1.0/1.5	SP*													

DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District				SHEET 2 OF 2 SHEETS		
			PROJECT Vibracore Borings GIWW/Vicinity of		COORDINATE SYSTEM/DATUM State Plane, FLW (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW	
LOCATION COORDINATES X = 435,302 Y = 1,209,817			ELEVATION TOP OF BORING -6.8 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
			2 3.0/3.5 SP-SM* *Lab visual classification based on gradation curve. No Atterberg limits.						



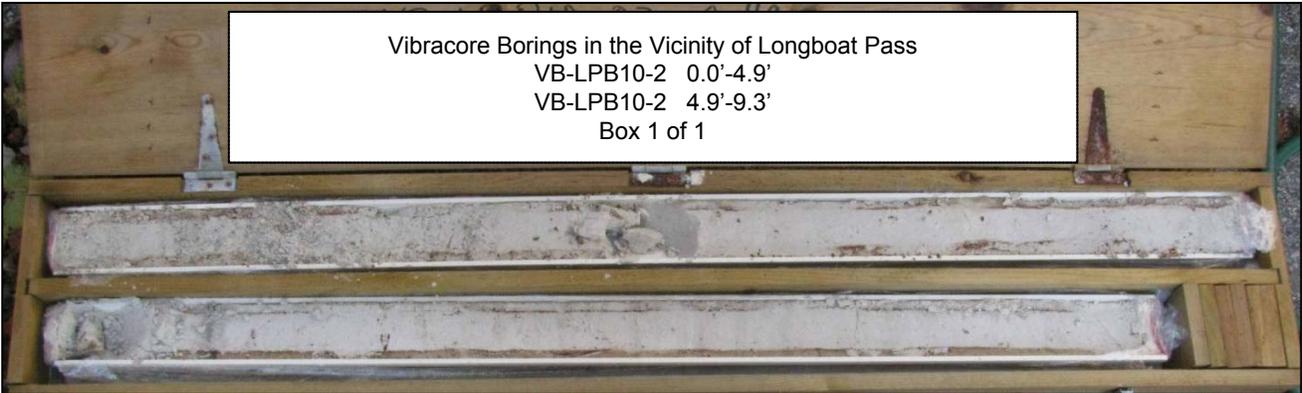
APPENDIX C

- **Photographs**



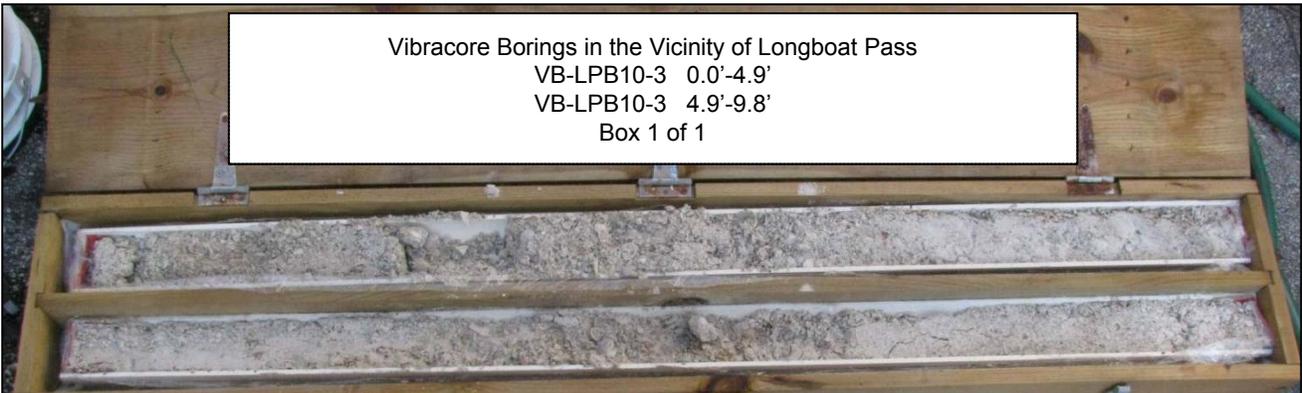
Vibracore Borings in the Vicinity of Longboat Pass
VB-LPB10-1 0.0'-4.9'
VB-LPB10-1 4.9'-7.9'
Box 1 of 1

VB-LBP10-1



Vibracore Borings in the Vicinity of Longboat Pass
VB-LPB10-2 0.0'-4.9'
VB-LPB10-2 4.9'-9.3'
Box 1 of 1

VB-LBP10-2



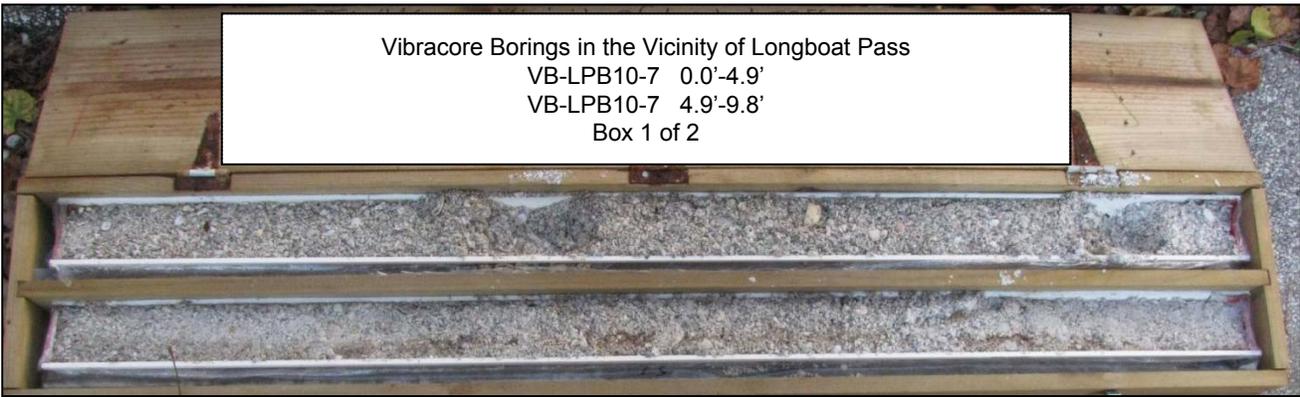
Vibracore Borings in the Vicinity of Longboat Pass
VB-LPB10-3 0.0'-4.9'
VB-LPB10-3 4.9'-9.8'
Box 1 of 1

VB-LBP10-3



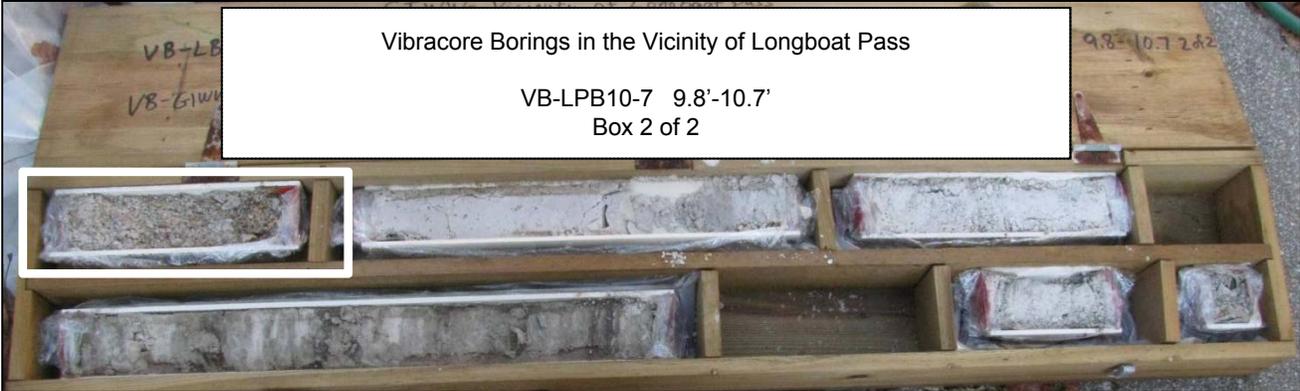
Vibracore Borings in the Vicinity of Longboat Pass
VB-LPB10-6 0.0'-4.9'
VB-LPB10-6 4.9'-8.8'
Box 1 of 1

VB-LBP10-6



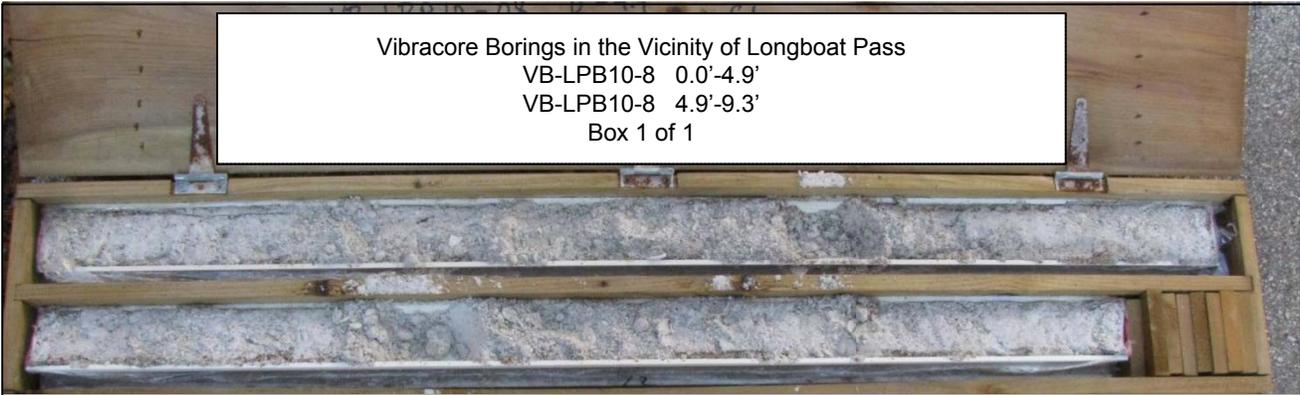
Vibracore Borings in the Vicinity of Longboat Pass
VB-LPB10-7 0.0'-4.9'
VB-LPB10-7 4.9'-9.8'
Box 1 of 2

VB-LBP10-7



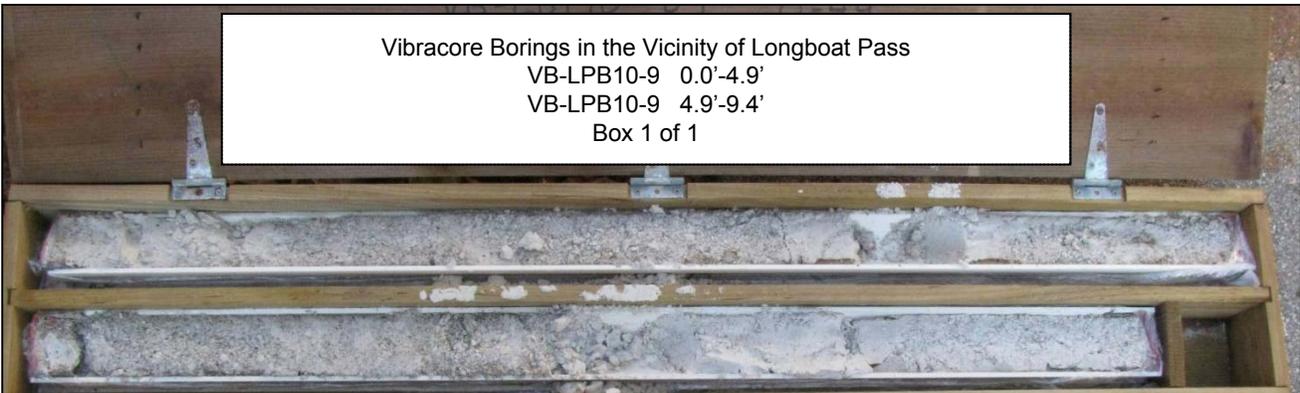
Vibracore Borings in the Vicinity of Longboat Pass
VB-LPB10-7 9.8'-10.7'
Box 2 of 2

VB-LBP10-7



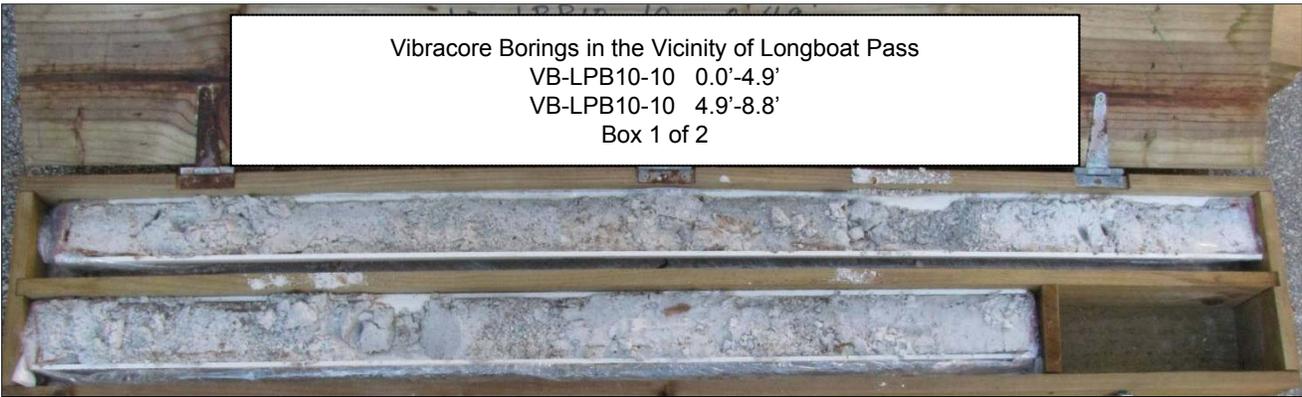
Vibracore Borings in the Vicinity of Longboat Pass
VB-LPB10-8 0.0'-4.9'
VB-LPB10-8 4.9'-9.3'
Box 1 of 1

VB-LBP10-8



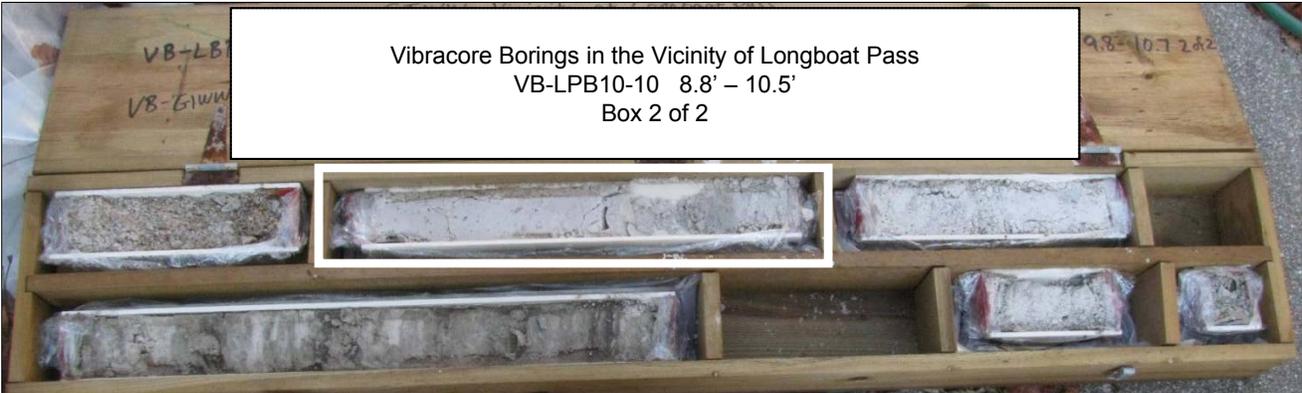
Vibracore Borings in the Vicinity of Longboat Pass
VB-LPB10-9 0.0'-4.9'
VB-LPB10-9 4.9'-9.4'
Box 1 of 1

VB-LBP10-9



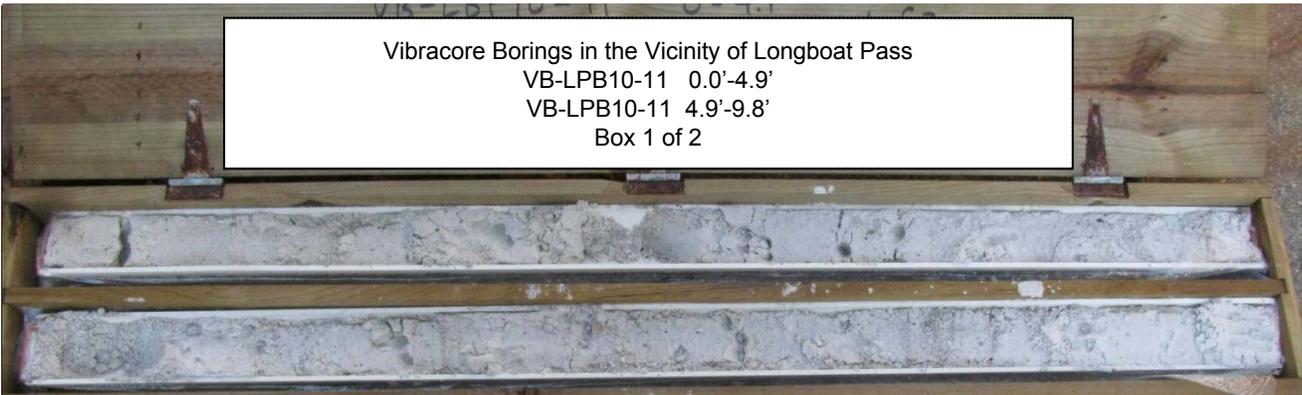
Vibracore Borings in the Vicinity of Longboat Pass
VB-LPB10-10 0.0'-4.9'
VB-LPB10-10 4.9'-8.8'
Box 1 of 2

VB-LBP10-10



Vibracore Borings in the Vicinity of Longboat Pass
VB-LPB10-10 8.8' - 10.5'
Box 2 of 2

VB-LBP10-10



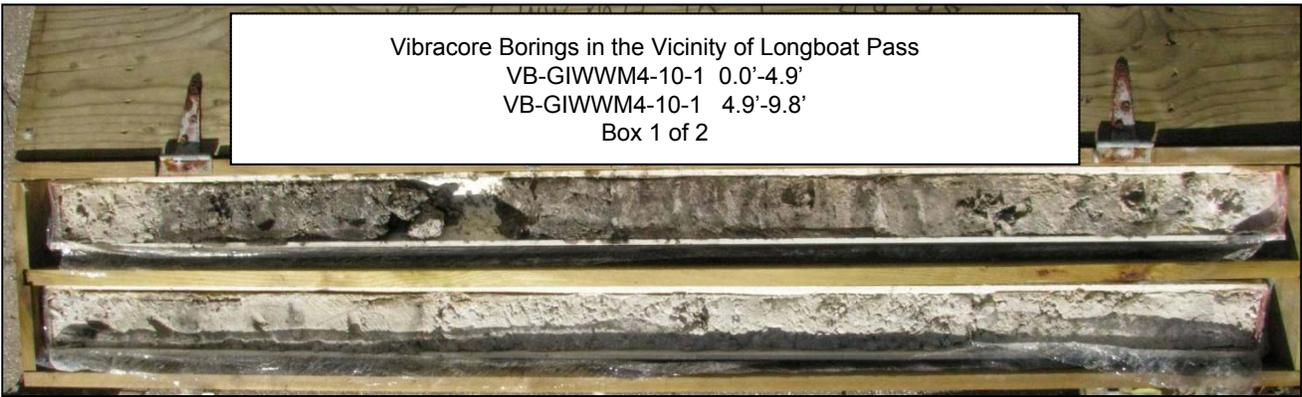
Vibracore Borings in the Vicinity of Longboat Pass
VB-LPB10-11 0.0'-4.9'
VB-LPB10-11 4.9'-9.8'
Box 1 of 2

VB-LBP10-11



Vibracore Borings in the Vicinity of Longboat Pass
VB-LPB10-11 9.8' - 10.75'
Box 2 of 2

VB-LBP10-11



Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWM4-10-1 0.0'-4.9'
VB-GIWWM4-10-1 4.9'-9.8'
Box 1 of 2

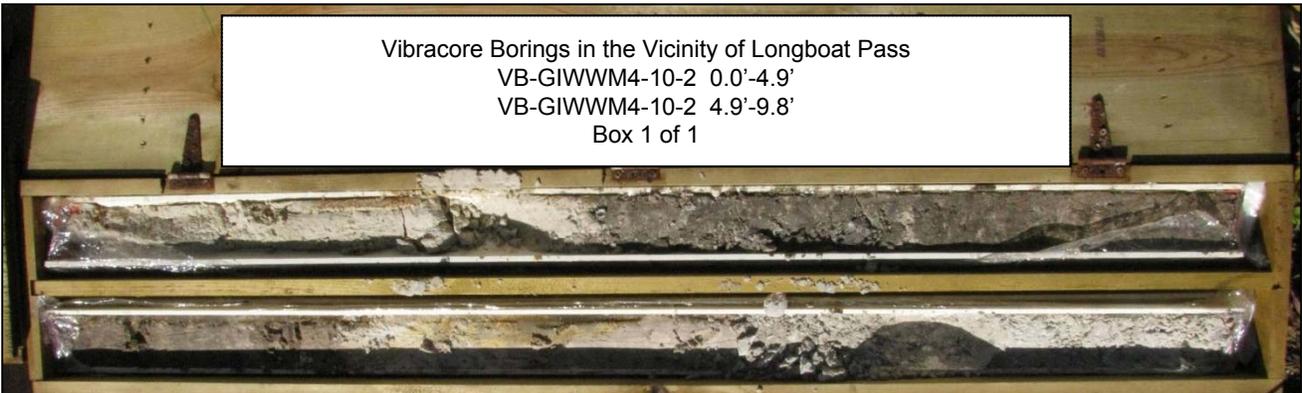
VB-GIWWM4-10-1



Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWM4-10-1 9.8' - 11.6'
Box 2 of 2

8-10.5
3-10-1
of 2

VB-GIWWM4-10-1



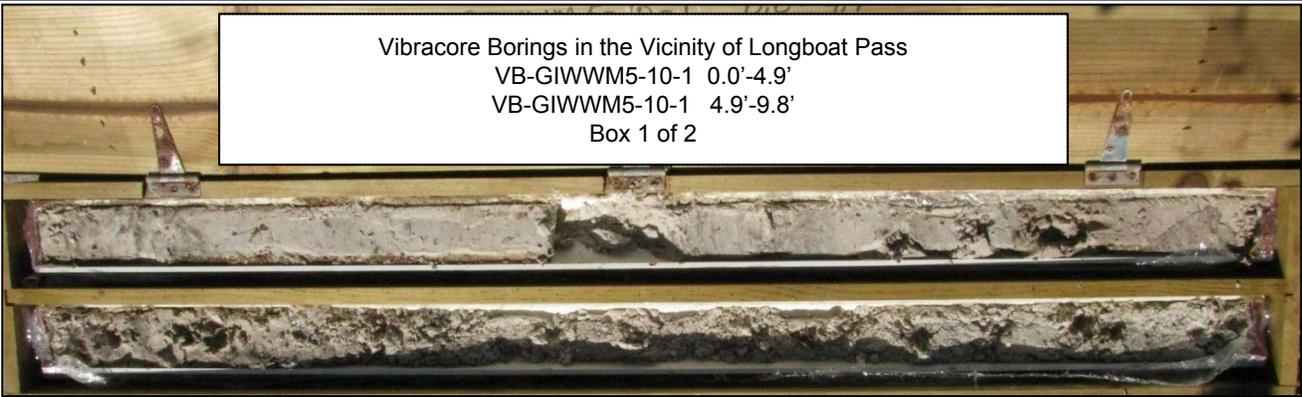
Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWM4-10-2 0.0'-4.9'
VB-GIWWM4-10-2 4.9'-9.8'
Box 1 of 1

VB-GIWWM4-10-2



Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWM4-10-3 0.0'-4.9'
VB-GIWWM4-10-3 4.9'-9.8'
Box 1 of 1

VB-GIWWM4-10-3



Vibracore Borings in the Vicinity of Longboat Pass
 VB-GIWWM5-10-1 0.0'-4.9'
 VB-GIWWM5-10-1 4.9'-9.8'
 Box 1 of 2

VB-GIWWM5-10-1



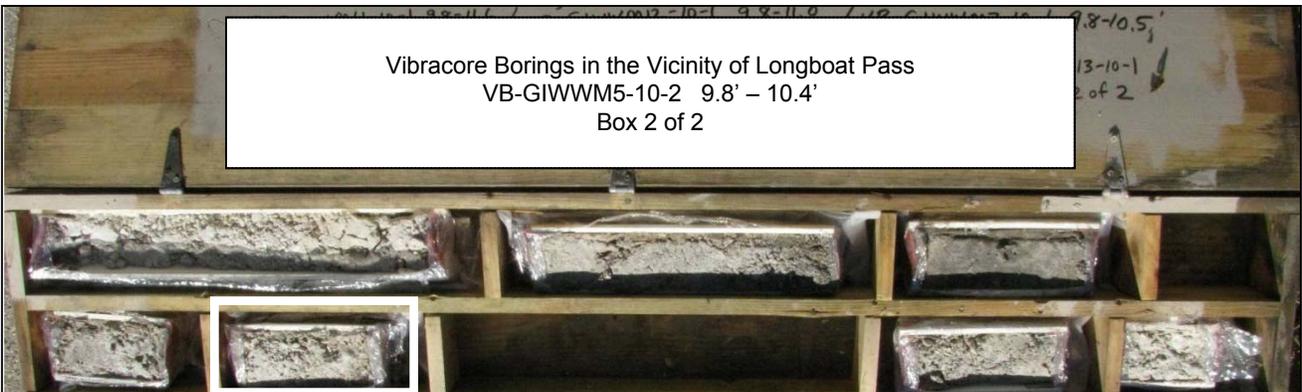
Vibracore Borings in the Vicinity of Longboat Pass
 VB-GIWWM5-10-1 9.8' - 10.3
 Box 2 of 2

VB-GIWWM5-10-1



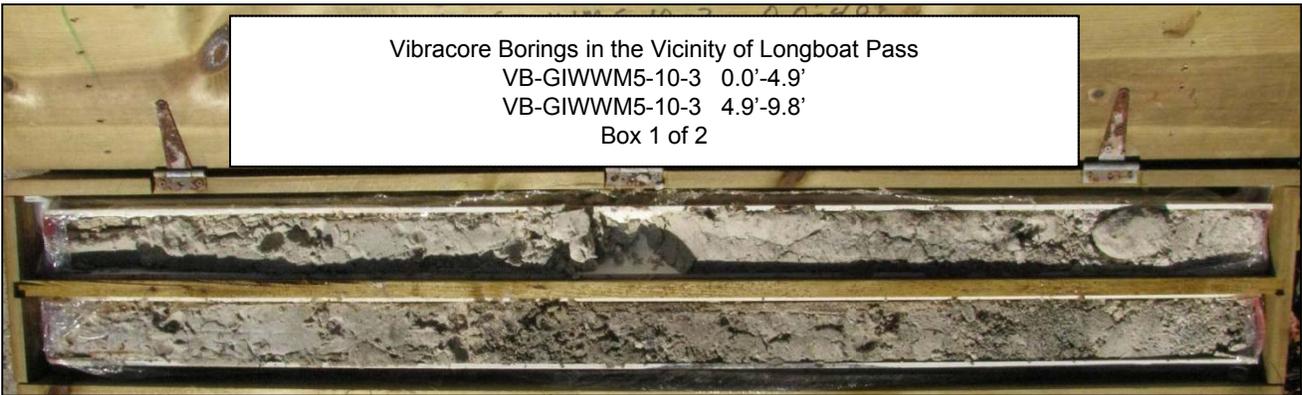
Vibracore Borings in the Vicinity of Longboat Pass
 VB-GIWWM5-10-2 0.0'-4.9'
 VB-GIWWM5-10-2 4.9'-9.8'
 Box 1 of 2

VB-GIWWM5-10-2



Vibracore Borings in the Vicinity of Longboat Pass
 VB-GIWWM5-10-2 9.8' - 10.4'
 Box 2 of 2

VB-GIWWM5-10-2



Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWW5-10-3 0.0'-4.9'
VB-GIWWW5-10-3 4.9'-9.8'
Box 1 of 2

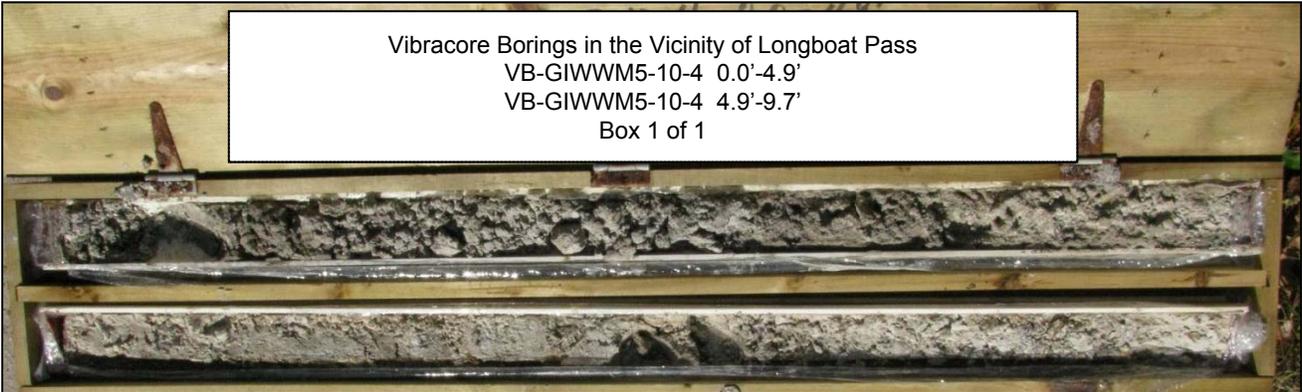
VB-GIWWW5-10-3



Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWW5-10-3 9.8'-10.4'
Box 2 of 2

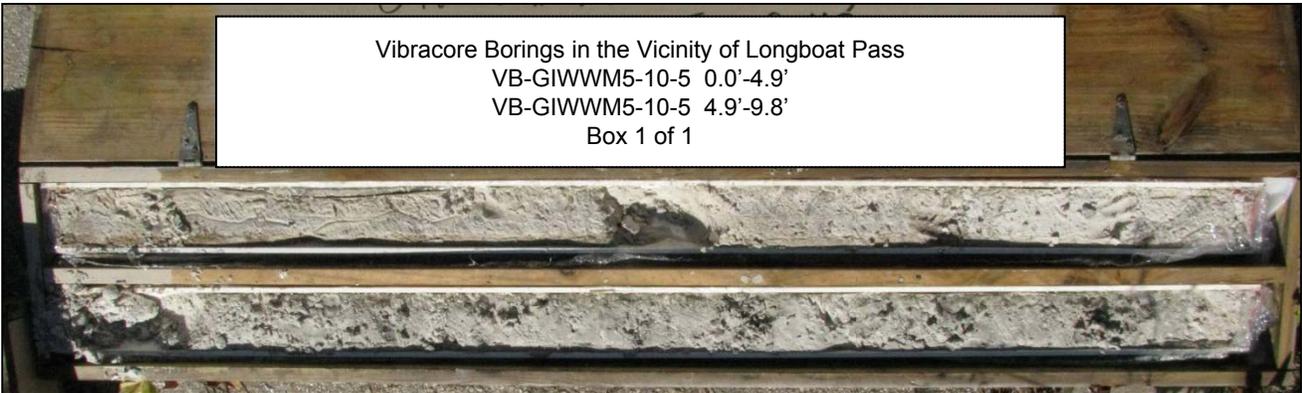
8-10.5'
3-10-1
of 2

VB-GIWWW5-10-3



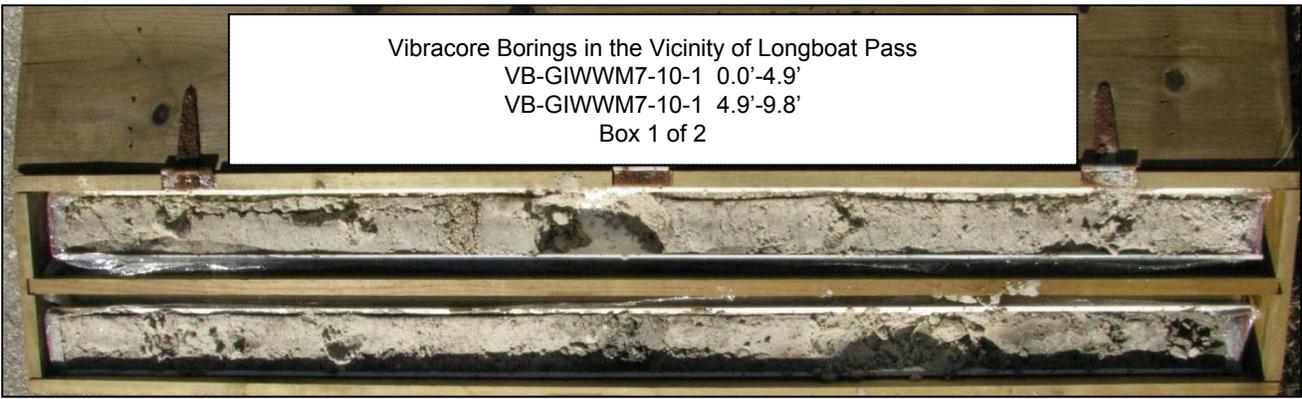
Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWW5-10-4 0.0'-4.9'
VB-GIWWW5-10-4 4.9'-9.7'
Box 1 of 1

VB-GIWWW5-10-4



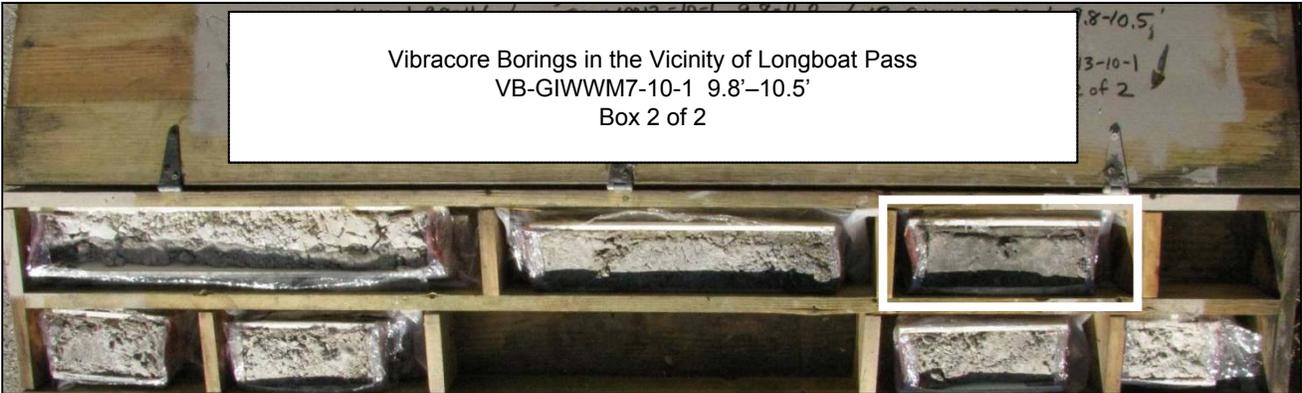
Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWW5-10-5 0.0'-4.9'
VB-GIWWW5-10-5 4.9'-9.8'
Box 1 of 1

VB-GIWWW5-10-5



Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWM7-10-1 0.0'-4.9'
VB-GIWWM7-10-1 4.9'-9.8'
Box 1 of 2

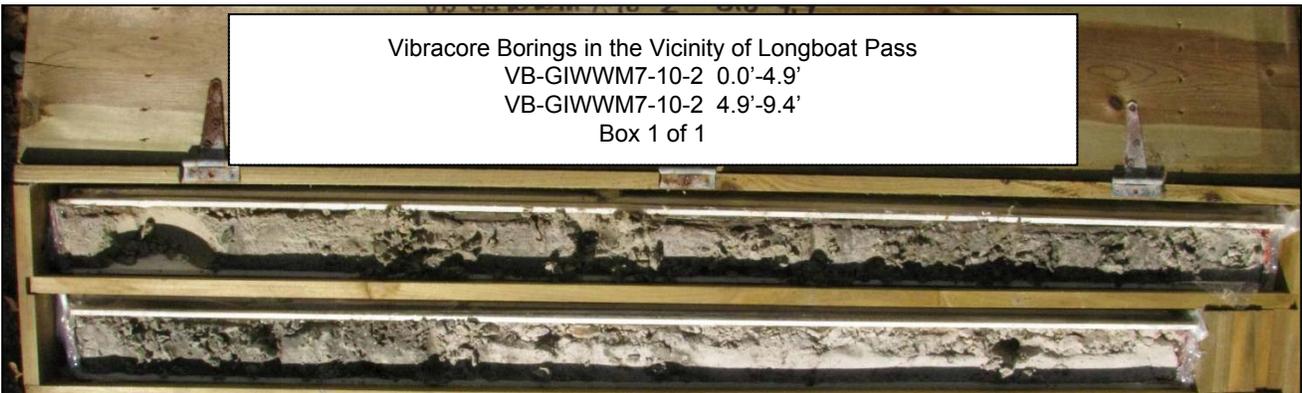
VB-GIWWM7-10-1



Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWM7-10-1 9.8'-10.5'
Box 2 of 2

8-10.5'
3-10-1
of 2

VB-GIWWM7-10-1



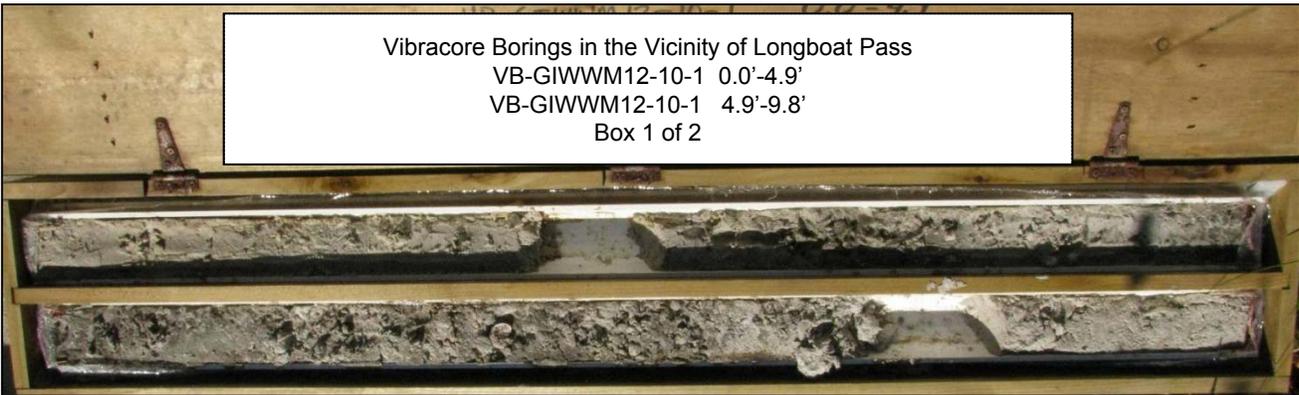
Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWM7-10-2 0.0'-4.9'
VB-GIWWM7-10-2 4.9'-9.4'
Box 1 of 1

VB-GIWWM7-10-2



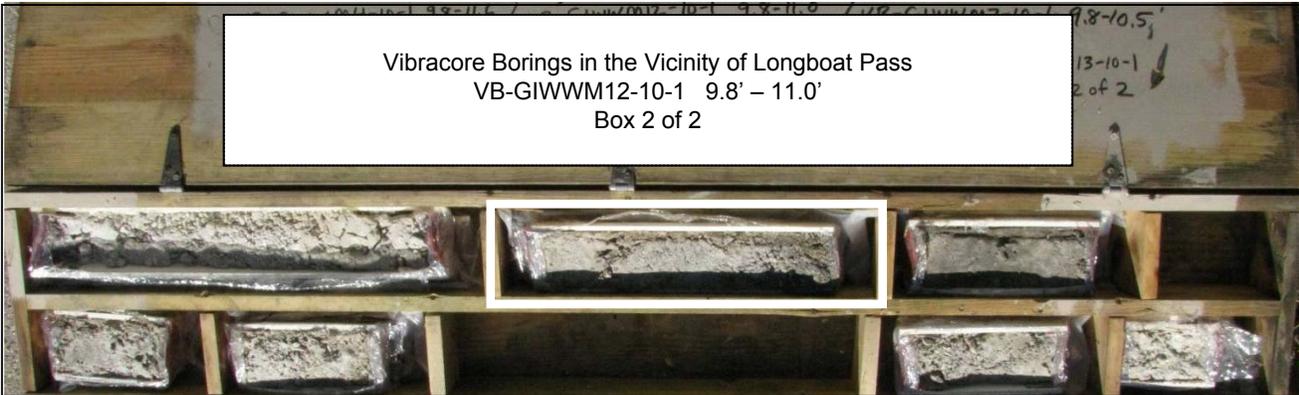
Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWM7-10-3 0.0'-4.9'
VB-GIWWM7-10-3 4.9'-9.8'
Box 1 of 1

VB-GIWWM7-10-3



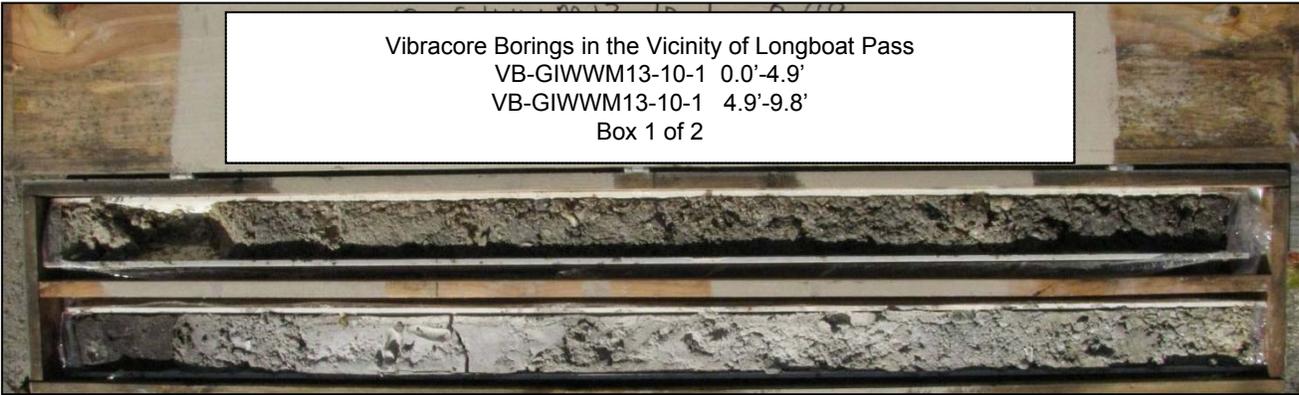
Vibracore Borings in the Vicinity of Longboat Pass
 VB-GIWWM12-10-1 0.0'-4.9'
 VB-GIWWM12-10-1 4.9'-9.8'
 Box 1 of 2

VB-GIWWM12-10-1



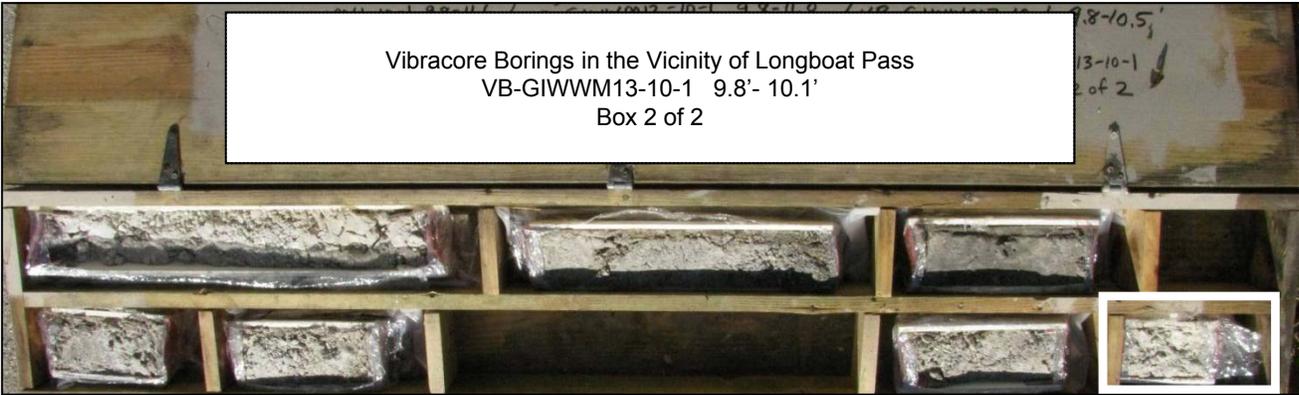
Vibracore Borings in the Vicinity of Longboat Pass
 VB-GIWWM12-10-1 9.8' - 11.0'
 Box 2 of 2

VB-GIWWM12-10-1



Vibracore Borings in the Vicinity of Longboat Pass
 VB-GIWWM13-10-1 0.0'-4.9'
 VB-GIWWM13-10-1 4.9'-9.8'
 Box 1 of 2

VB-GIWWM13-10-1



Vibracore Borings in the Vicinity of Longboat Pass
 VB-GIWWM13-10-1 9.8'- 10.1'
 Box 2 of 2

VB-GIWWM13-10-1



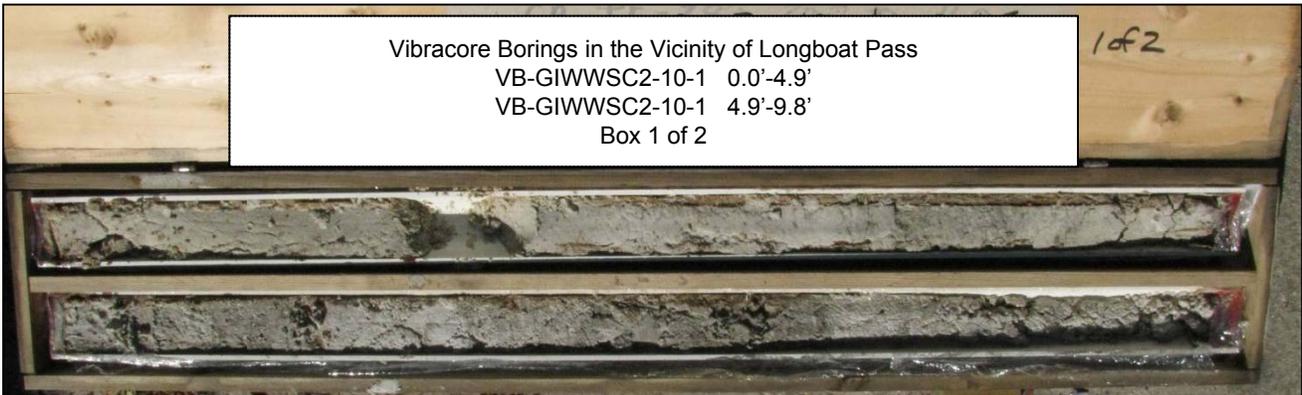
Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWM14-10-1 0.0'-4.9'
VB-GIWWM14-10-1 4.9'-9.8'
Box 1 of 2

VB-GIWWM14-10-1



Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWM14-10-1 9.8' - 10.1'
Box 2 of 2

VB-GIWWM14-10-1



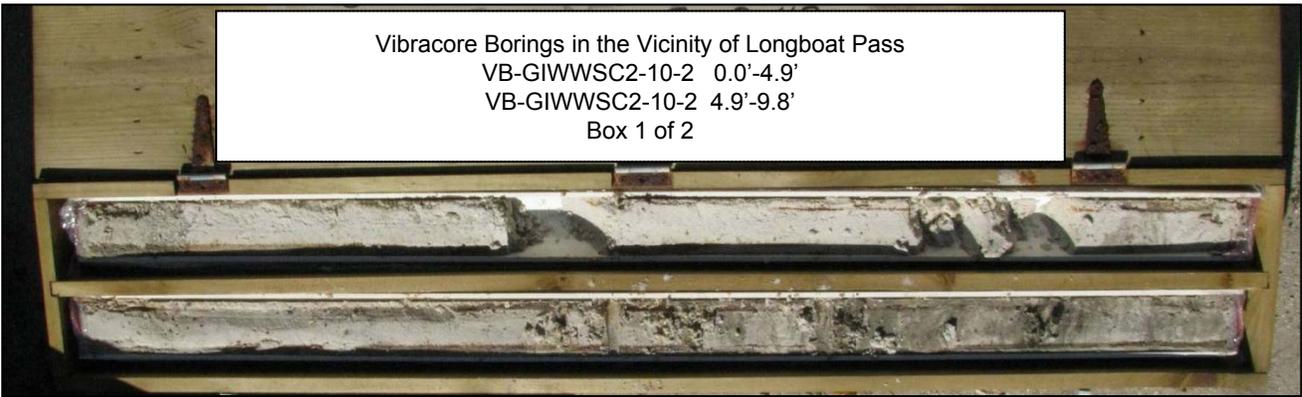
Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWSC2-10-1 0.0'-4.9'
VB-GIWWSC2-10-1 4.9'-9.8'
Box 1 of 2

VB-GIWWSC2-10-1



Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWSC2-10-1 9.8' - 10.3'
Box 2 of 2

VB-GIWWSC2-10-1



Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWSC2-10-2 0.0'-4.9'
VB-GIWWSC2-10-2 4.9'-9.8'
Box 1 of 2

VB-GIWWSC2-10-2



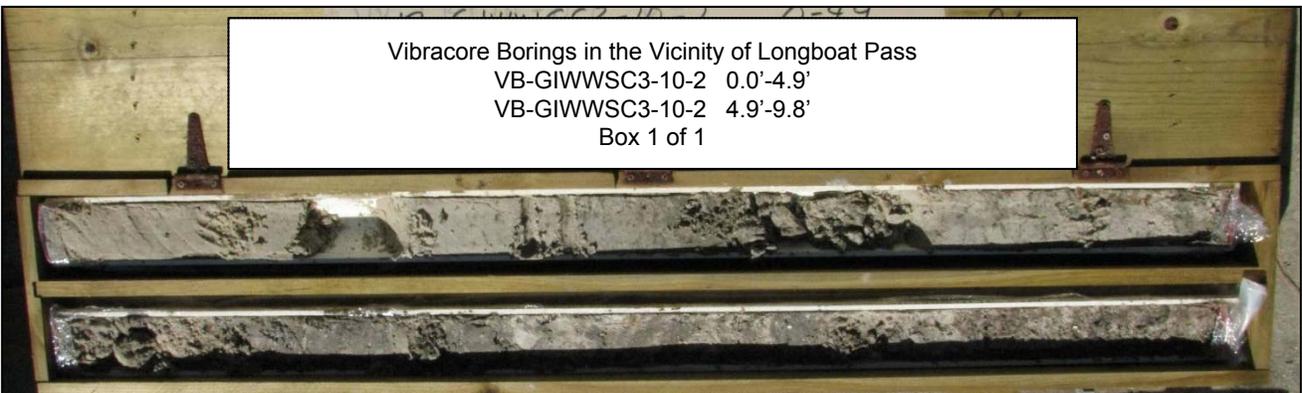
Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWSC2-10-2 9.8'-12.2'
Box 2 of 2

VB-GIWWSC2-10-2



Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWSC3-10-1 0.0'-4.9'
VB-GIWWSC3-10-1 4.9'-9.8'
Box 1 of 1

VB-GIWWSC3-10-1

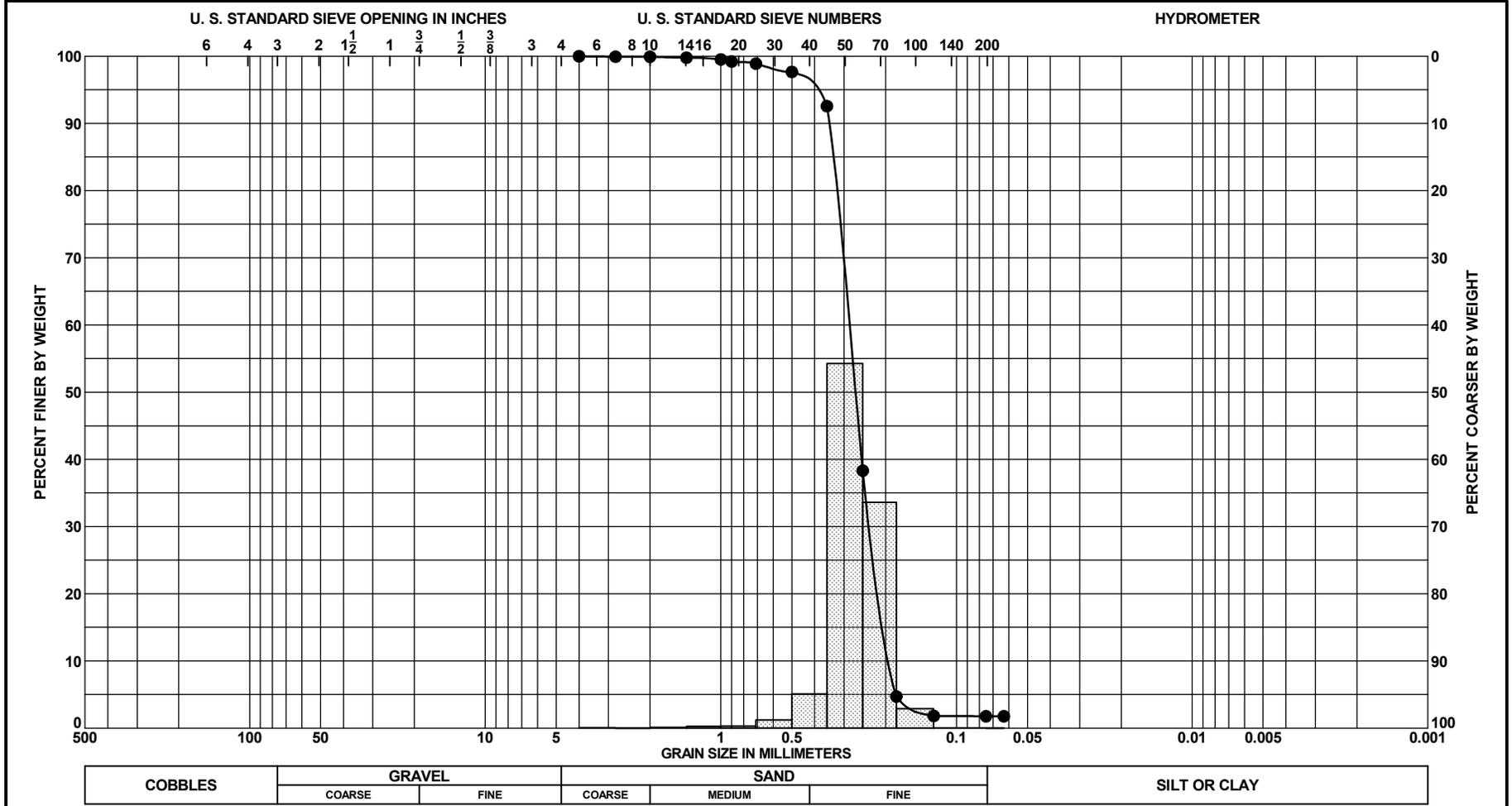


Vibracore Borings in the Vicinity of Longboat Pass
VB-GIWWSC3-10-2 0.0'-4.9'
VB-GIWWSC3-10-2 4.9'-9.8'
Box 1 of 1

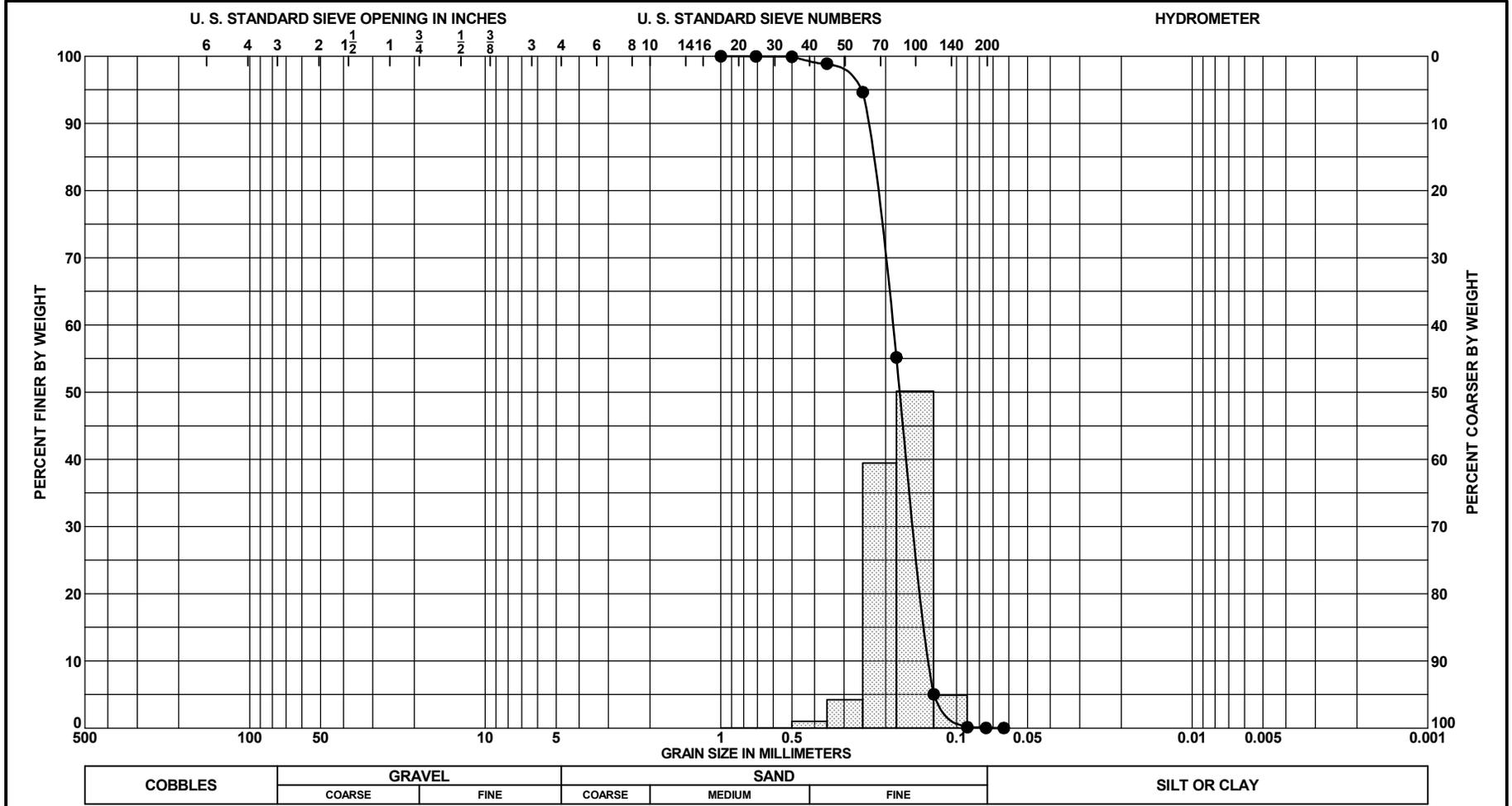
VB-GIWWSC3-10-2

APPENDIX D

- **Table 1: Visual % Shell and Fines**
- **Laboratory Test Results**

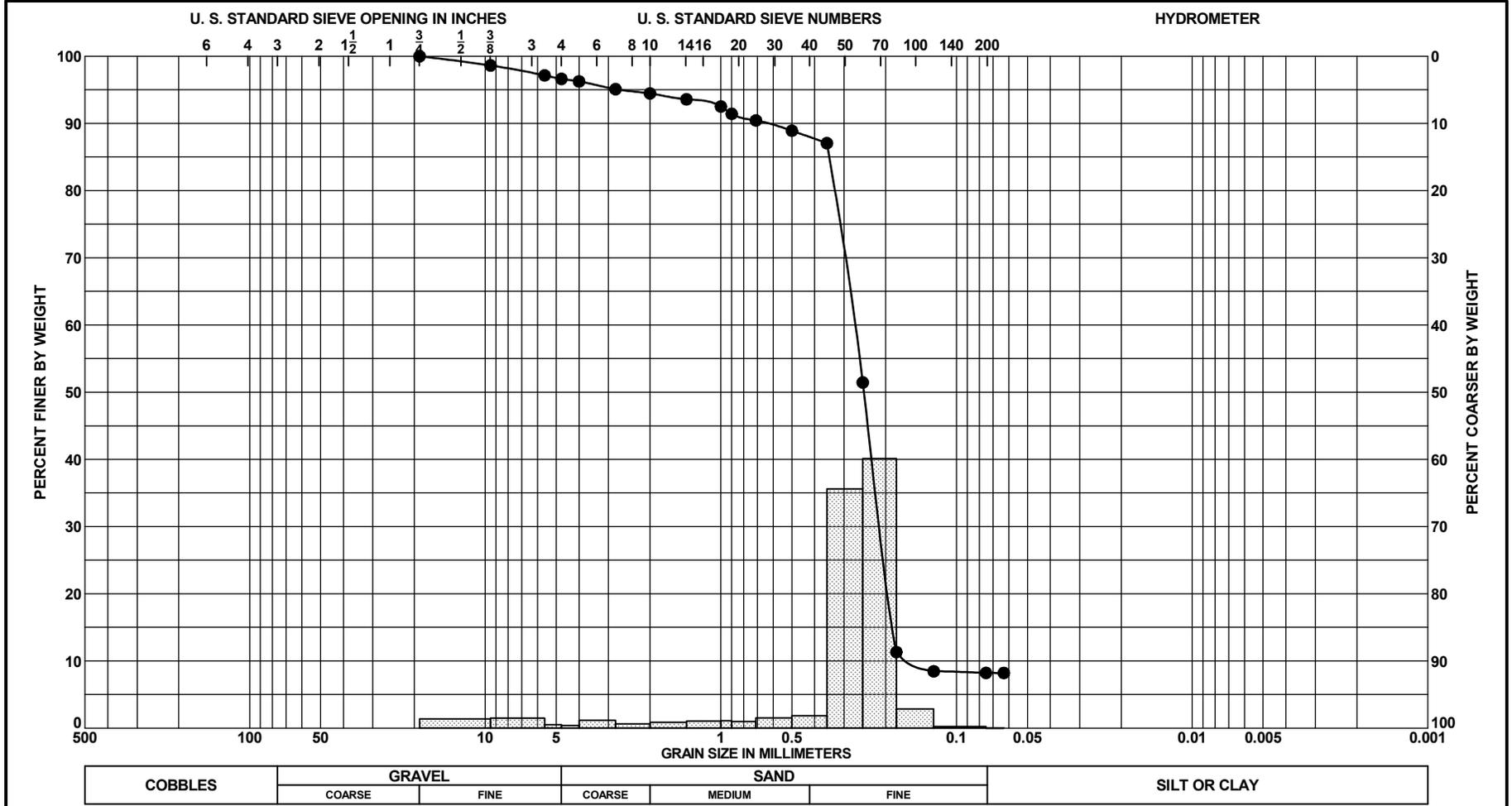


Sample No.	Depth	Classification	Munsell	CO ₃ %	G _s	Org %	w _n	LL	PL	PI	PROJECT	
											COARSE	FINE
● 1	2.0 to 2.5 Ft.	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace fine-grained sand-sized shell, trace silt, light gray (SP)	10YR 7/1	3/3 (est)							Vibracore Borings GIWW in the Vicinity	Longboat Pass
											BORING NO.	VB-GIWWM12-10-1
											BORING ELEV.	-5.4 Ft., MLLW
GRADATION CURVES											DATE	12/14/2010

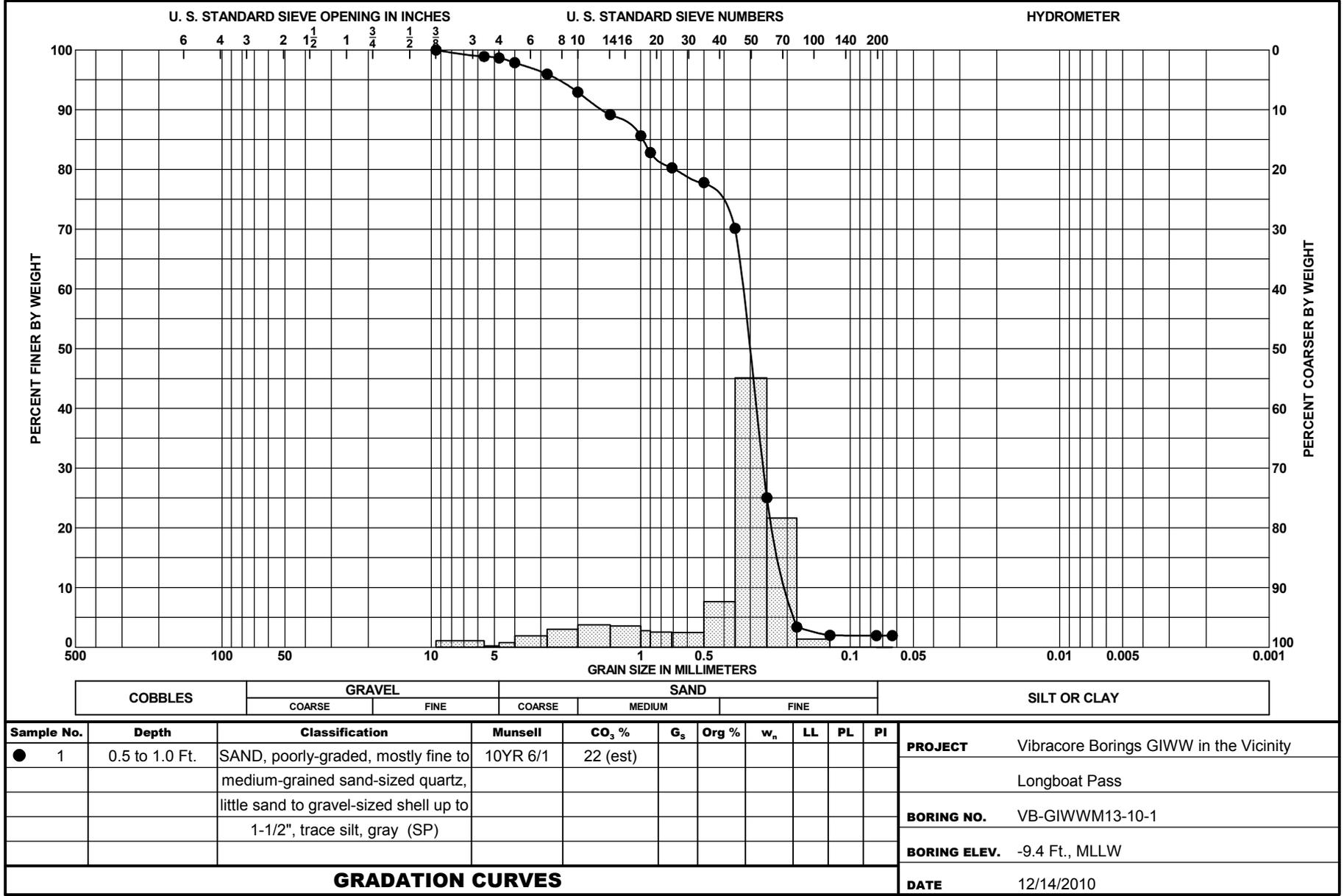


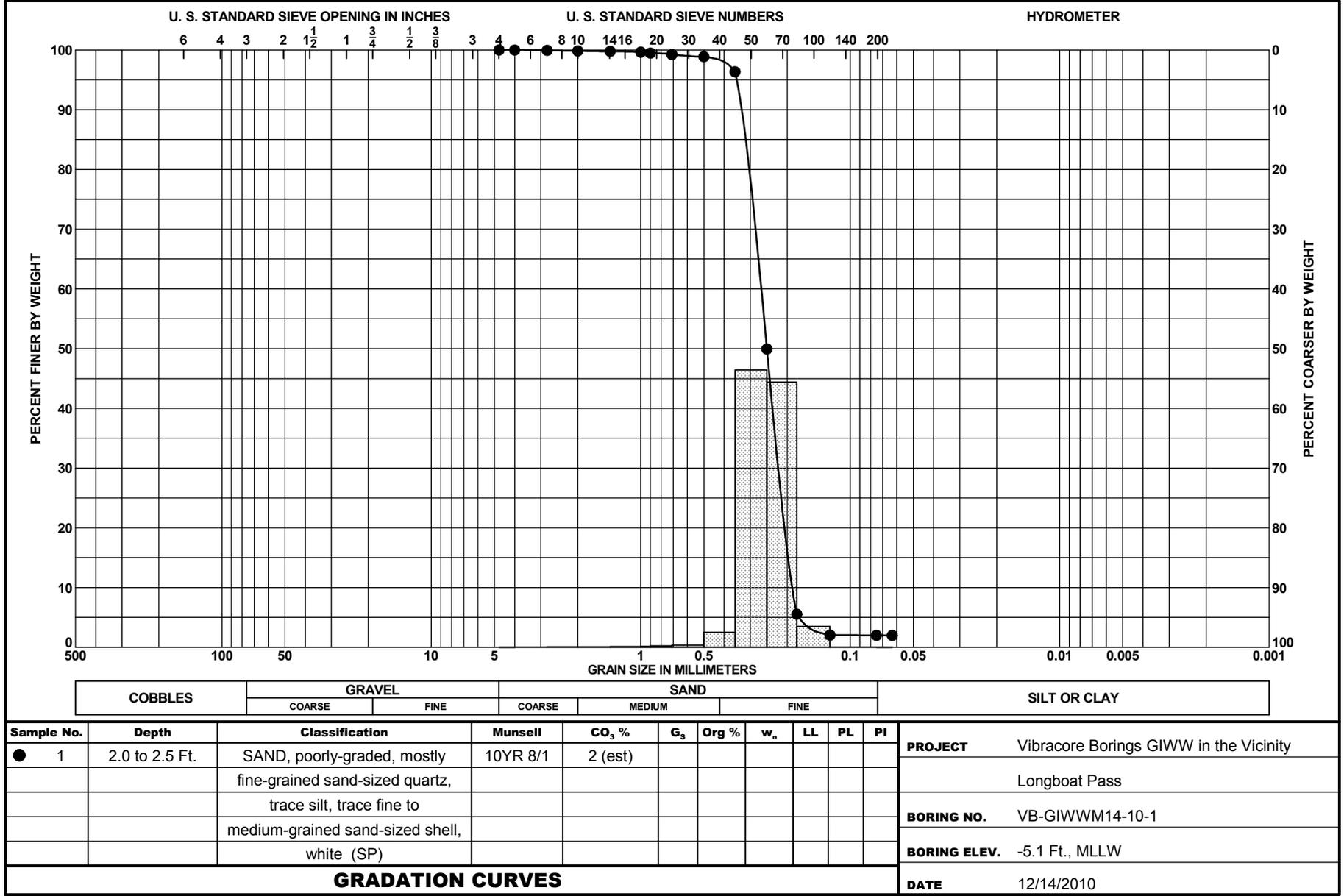
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

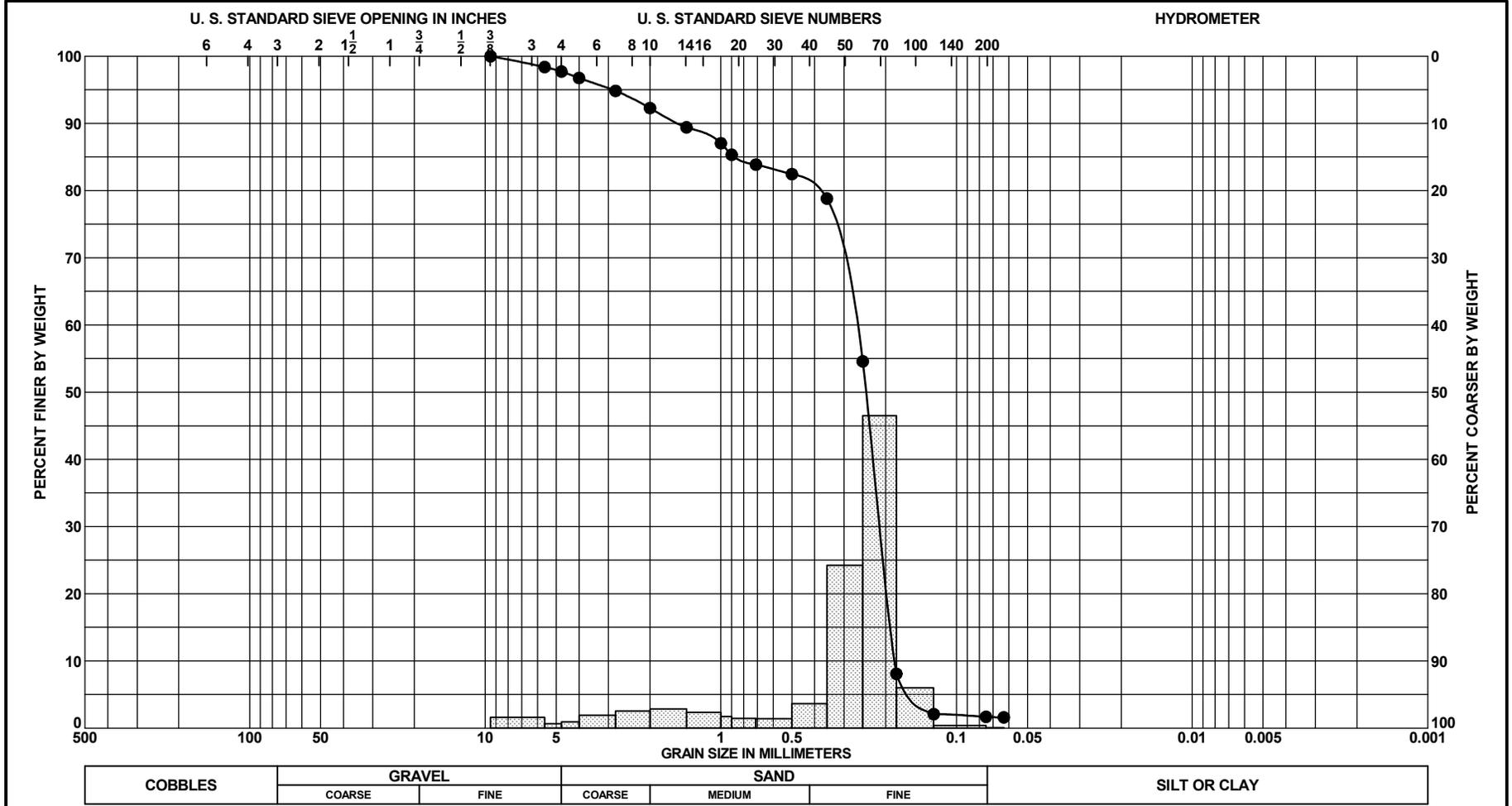
Sample No.	Depth	Classification	Munsell	CO ₃ %	G _s	Org %	w _n	LL	PL	PI	PROJECT
● 1-Post	2.0 to 2.5 Ft.	SAND, poorly-graded, mostly fine-grained sand-sized quartz, light gray (SP)	10YR 7/1								Vibracore Borings GIWW in the Vicinity Longboat Pass
											BORING NO. VB-GIWWM12-10-1
											BORING ELEV. -5.4 Ft., MLLW
GRADATION CURVES											DATE 12/15/2010



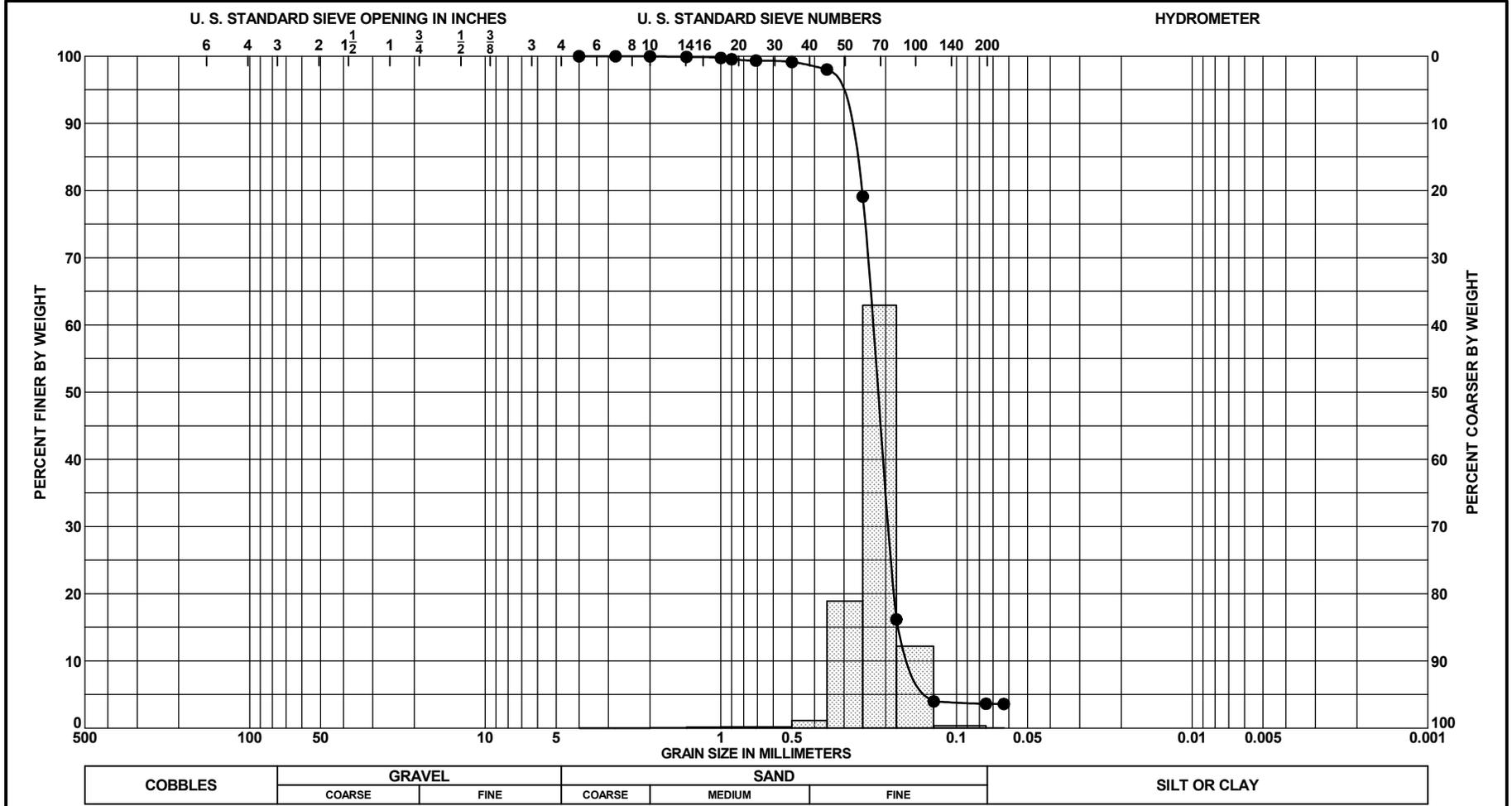
Sample No.	Depth	Classification	Munsell	CO ₃ %	G _s	Org %	w _n	LL	PL	PI	PROJECT	
											COARSE	FINE
● 2	4.0 to 4.5 Ft.	SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, few fine to medium-grained sand-sized shell, few silt, light gray (SP-SM)	10YR 7/1	11 (est)							Vibracore Borings GIWW in the Vicinity	Longboat Pass
											BORING NO.	VB-GIWWM12-10-1
											BORING ELEV.	-5.4 Ft., MLLW
GRADATION CURVES											DATE	12/14/2010



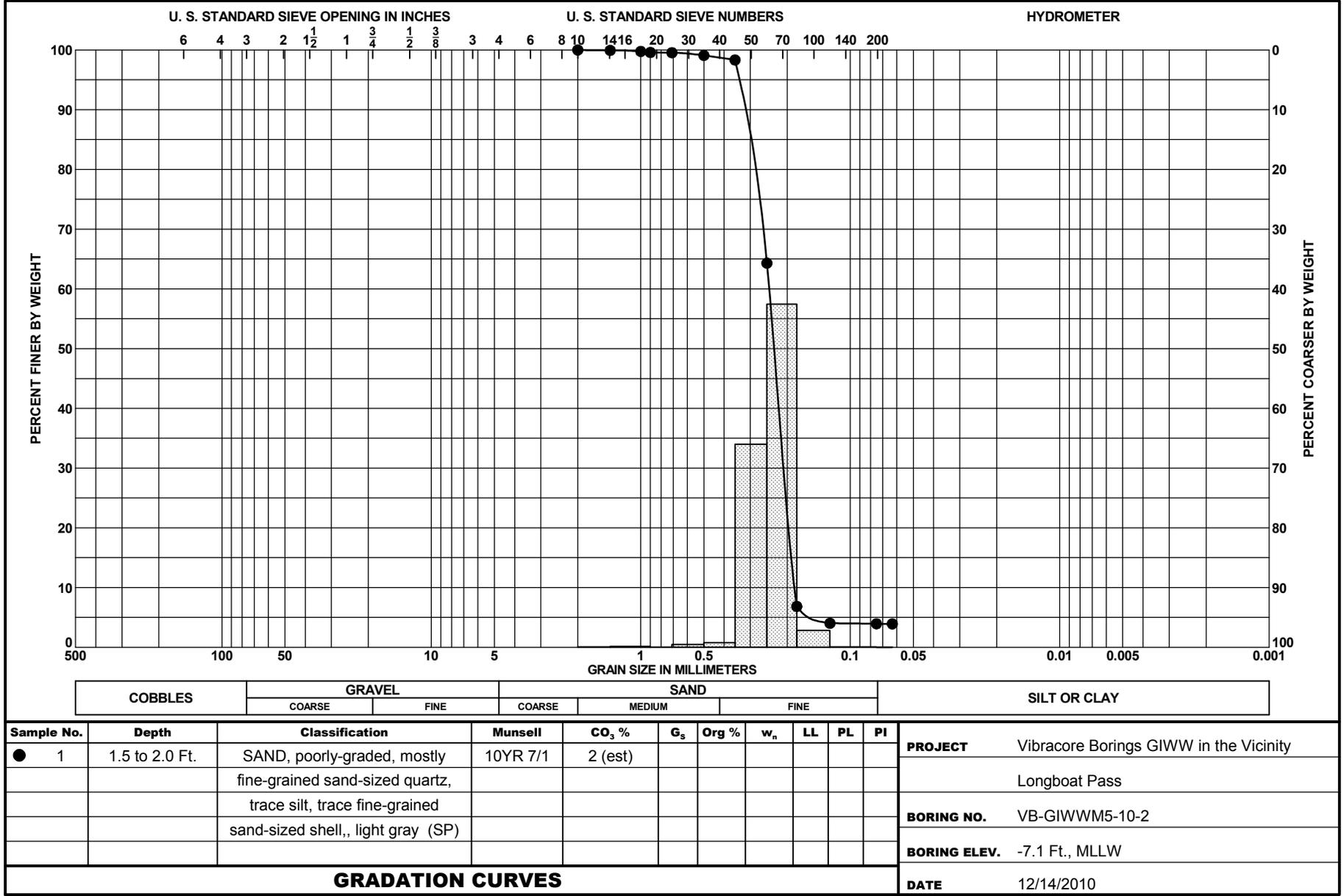


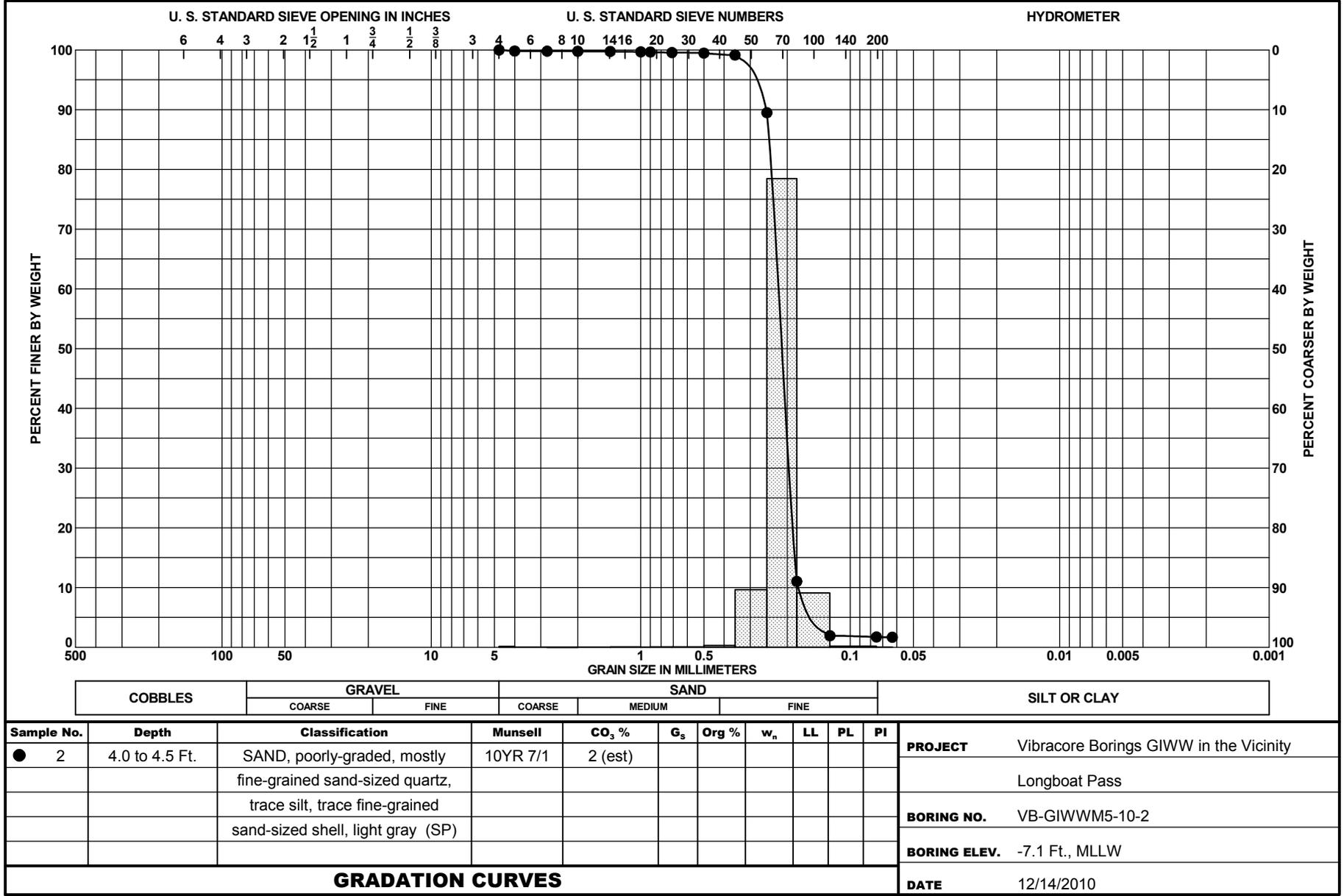


Sample No.	Depth	Classification	Munsell	CO ₃ %	G _s	Org %	w _n	LL	PL	PI	GRADATION CURVES	
											PROJECT	DATE
● 2	4.0 to 4.5 Ft.	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace fine to coarse-grained sand-sized shell, trace silt, white (SP)	10YR 8/1	18 (est)							PROJECT	Vibracore Borings GIWW in the Vicinity Longboat Pass
											BORING NO.	VB-GIWWM14-10-1
											BORING ELEV.	-5.1 Ft., MLLW
											DATE	12/14/2010

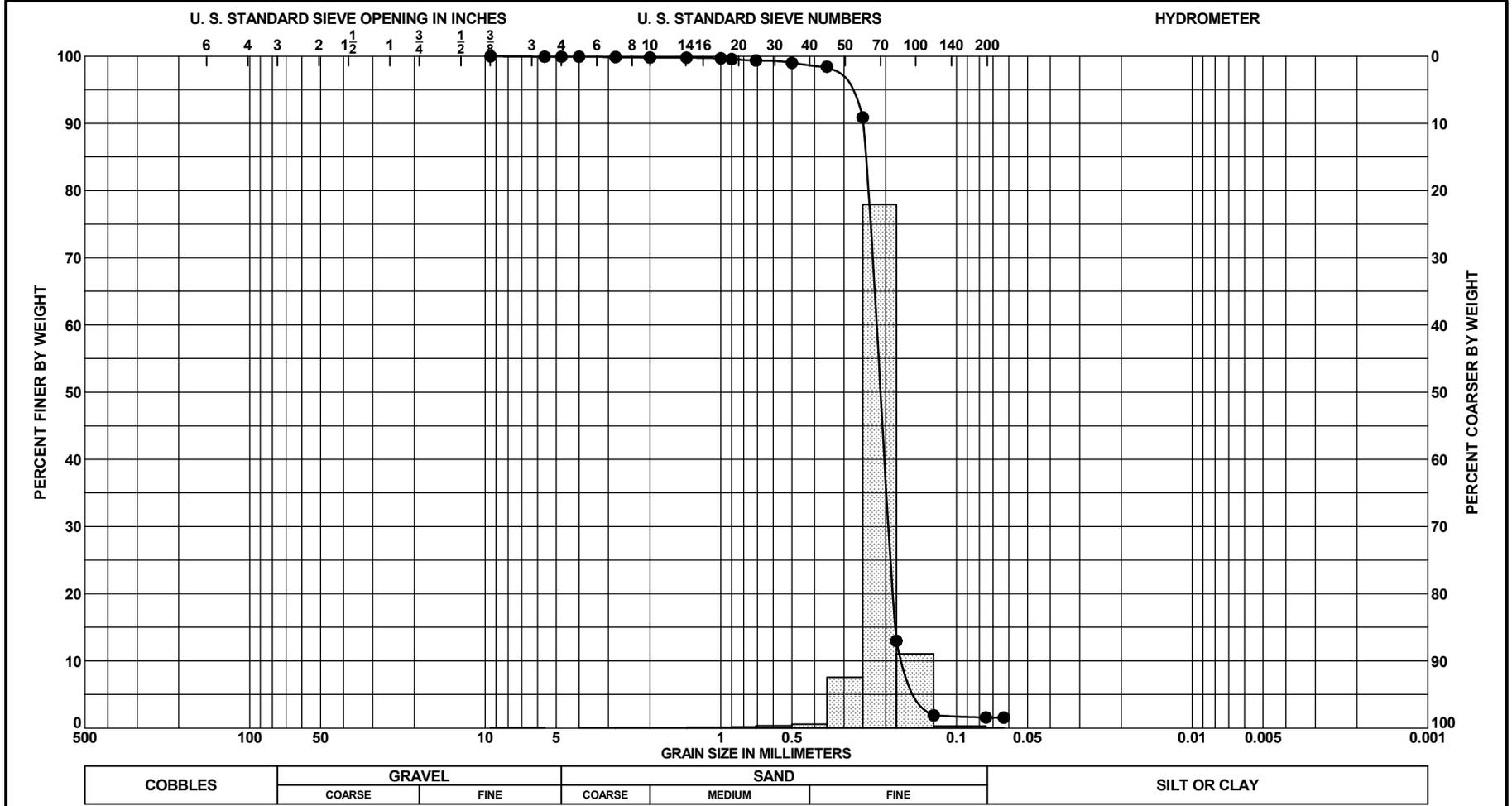


Sample No.	Depth	Classification	Munsell	CO ₃ %	G _s	Org %	w _n	LL	PL	PI	GRADATION CURVES	
											PROJECT	DATE
● 1	2.0 to 2.5 Ft.	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace fine-grained sand-sized shell, light gray (SP)	10YR 7/1	2 (est)							PROJECT	Vibracore Borings GIWW in the Vicinity Longboat Pass
											BORING NO.	VB-GIWW5-10-1
											BORING ELEV.	-7.8 Ft., MLLW
											DATE	12/14/2010

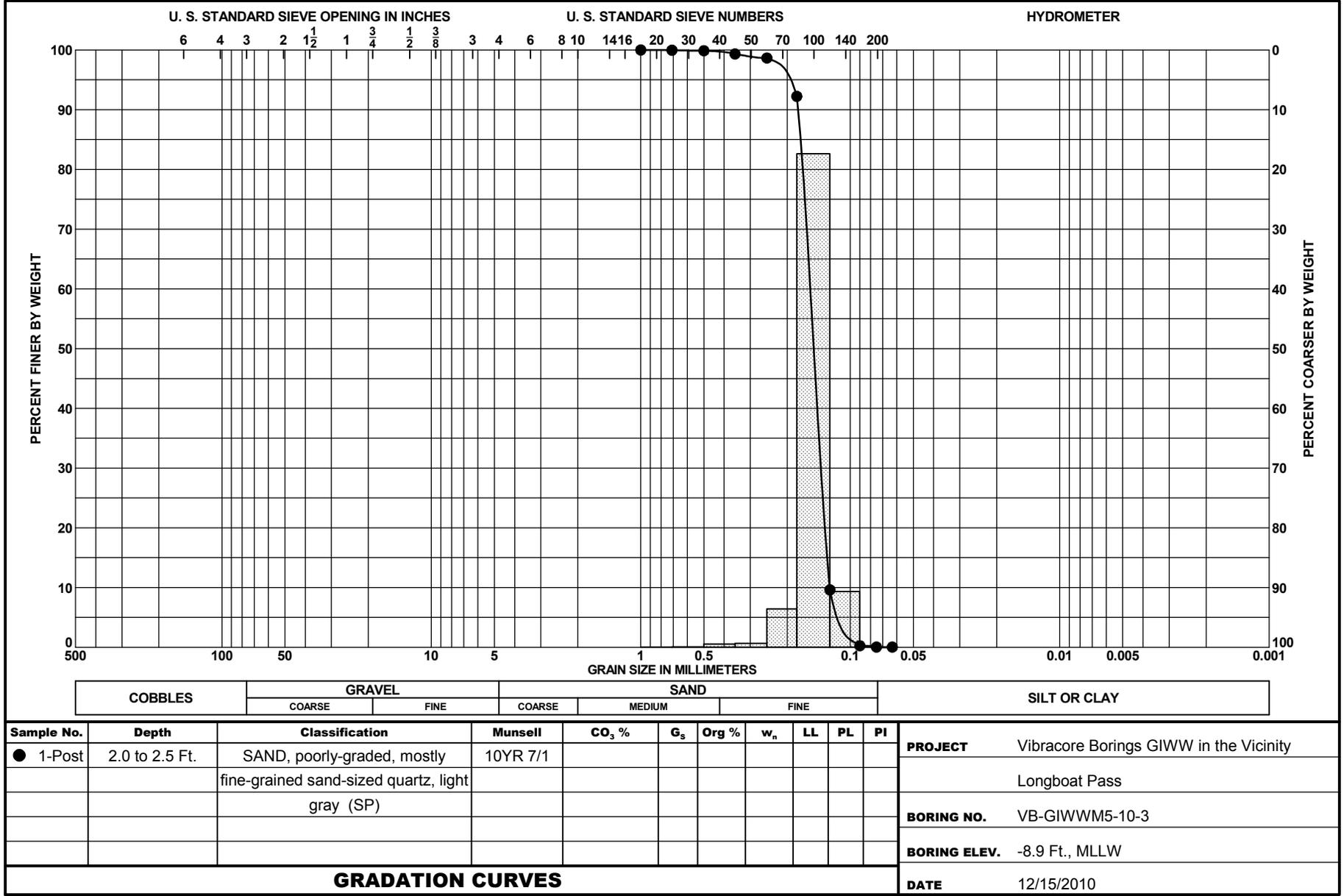


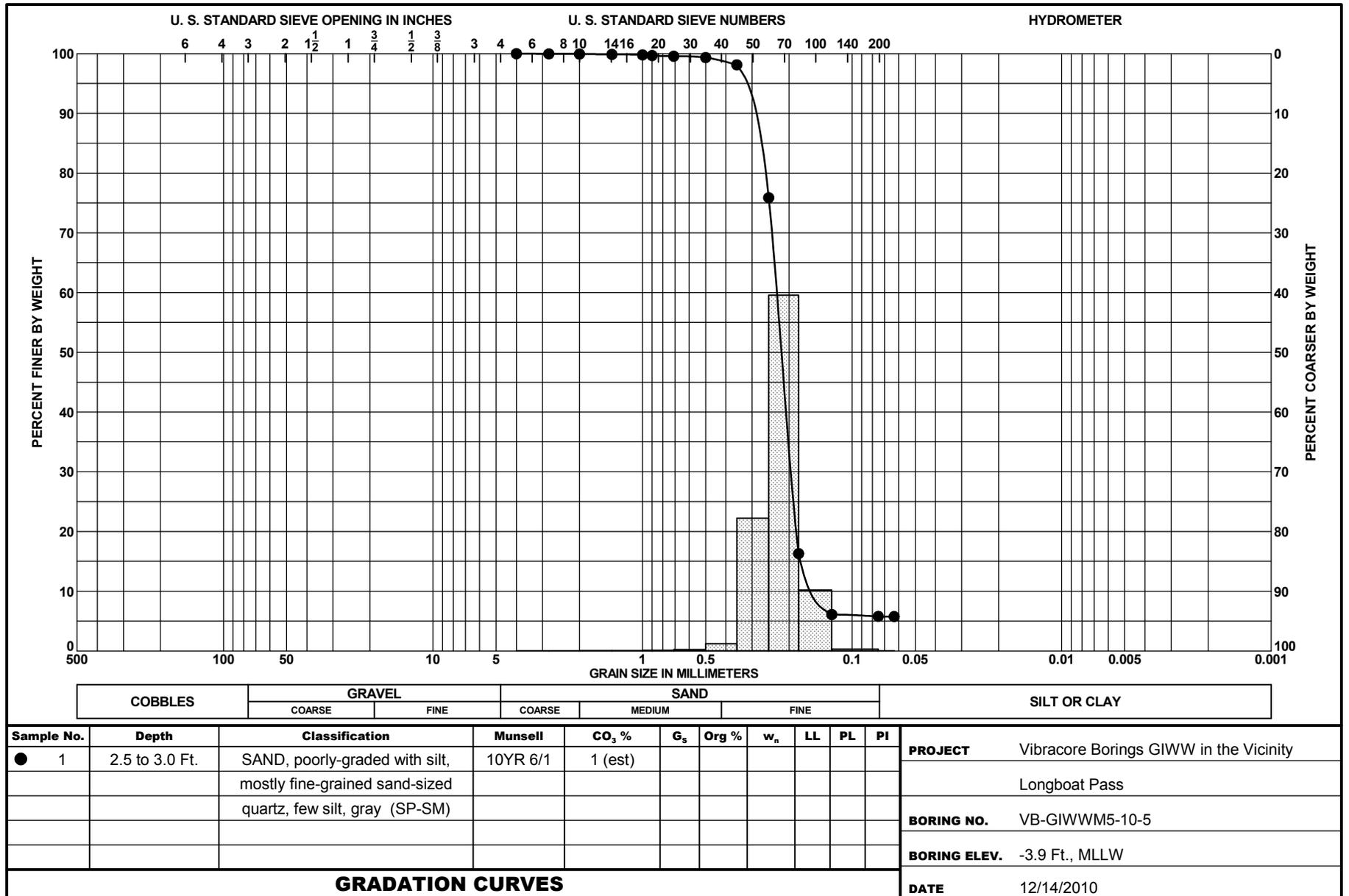


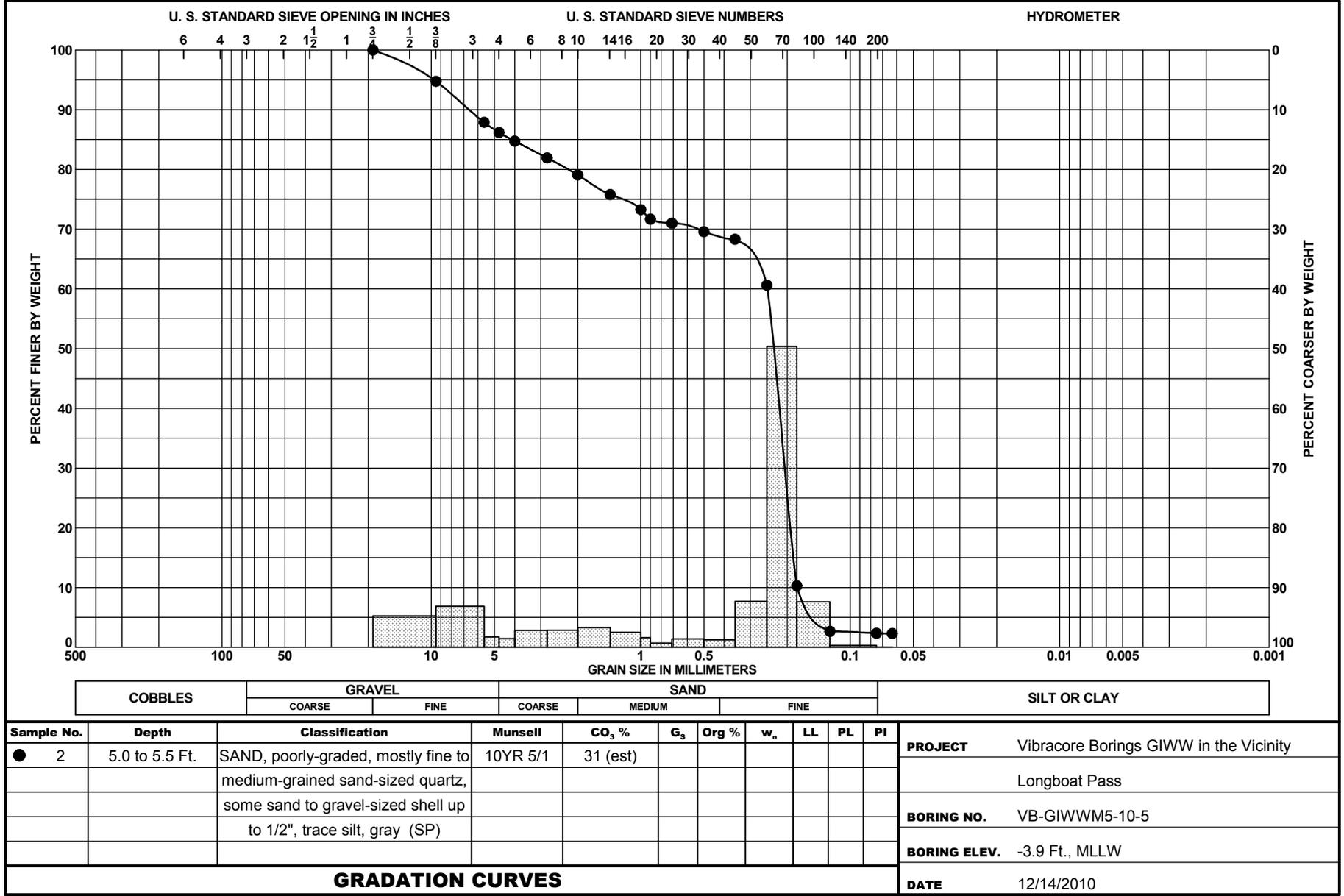
SAJ FORM 2087
JUN 02

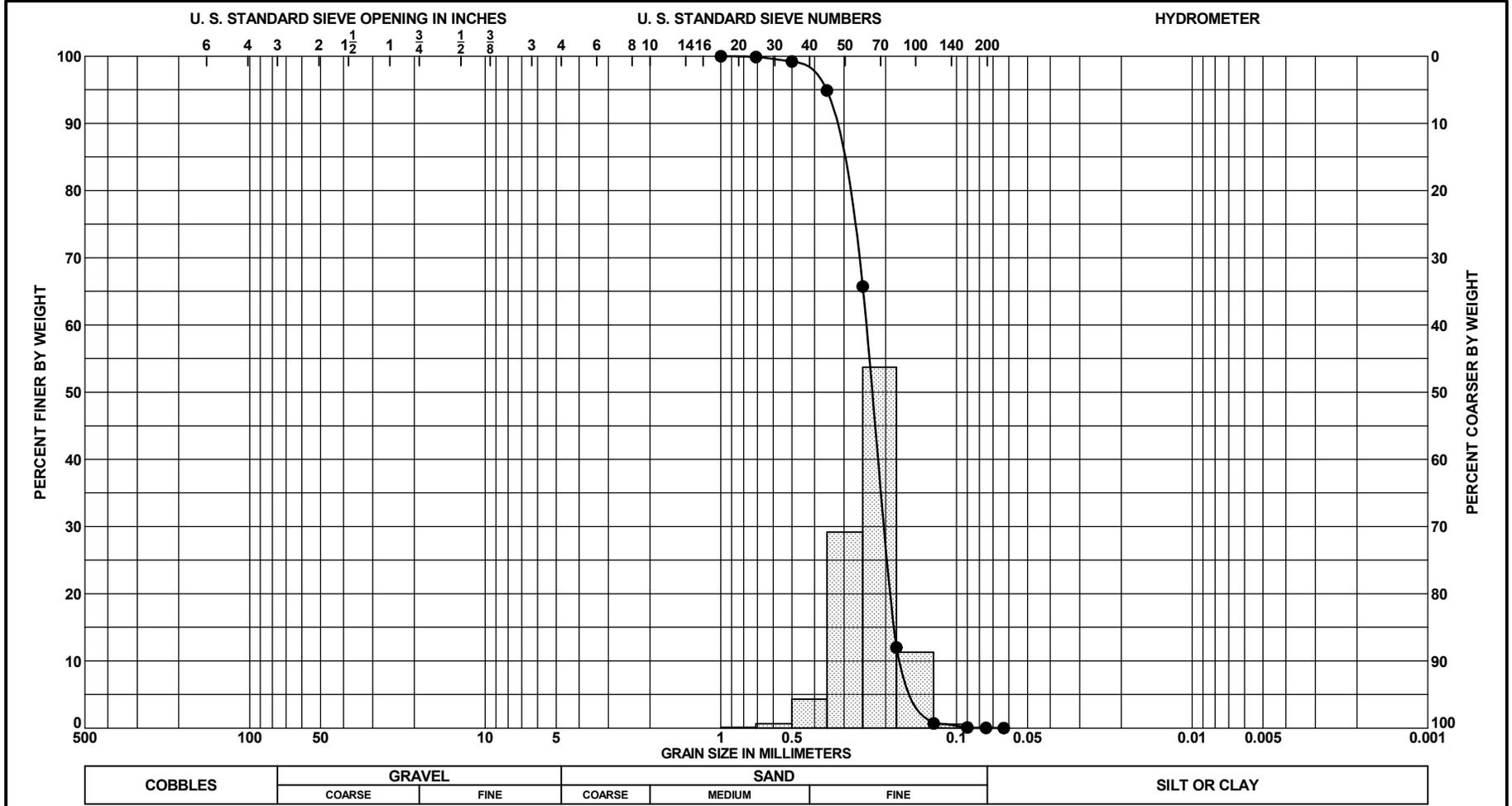


Sample No.	Depth	Classification	Munsell	CO ₃ %	G _s	Org %	w _n	LL	PL	PI	GRADATION CURVES	
											PROJECT	DATE
● 1	2.0 to 2.5 Ft.	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace fine-grained sand-sized shell, light gray (SP)	10YR 7/1	2/3 (est)							PROJECT: Vibracore Borings GIWW in the Vicinity Longboat Pass BORING NO.: VB-GIWW5-10-3 BORING ELEV.: -8.9 Ft., MLLW DATE: 12/14/2010	

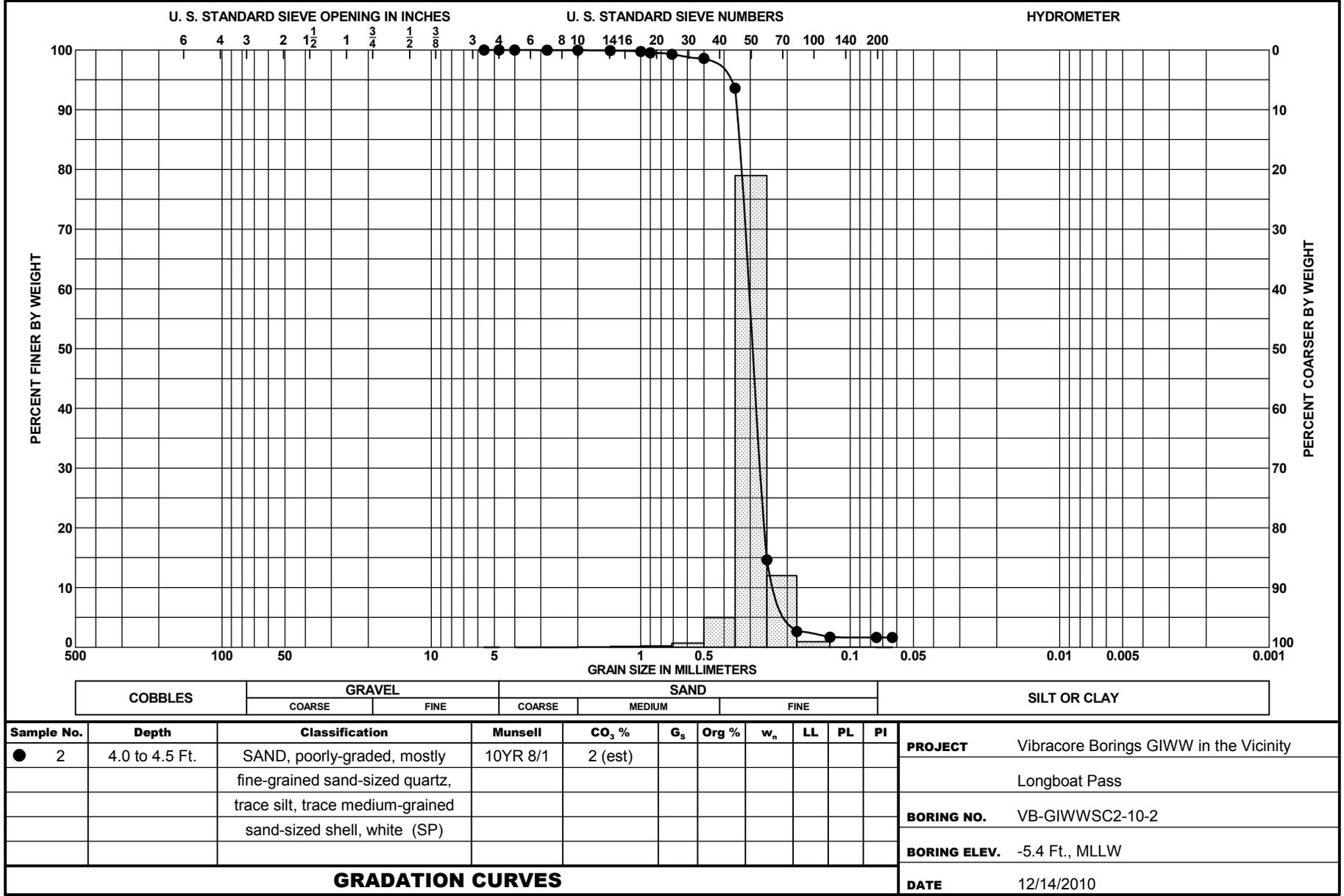


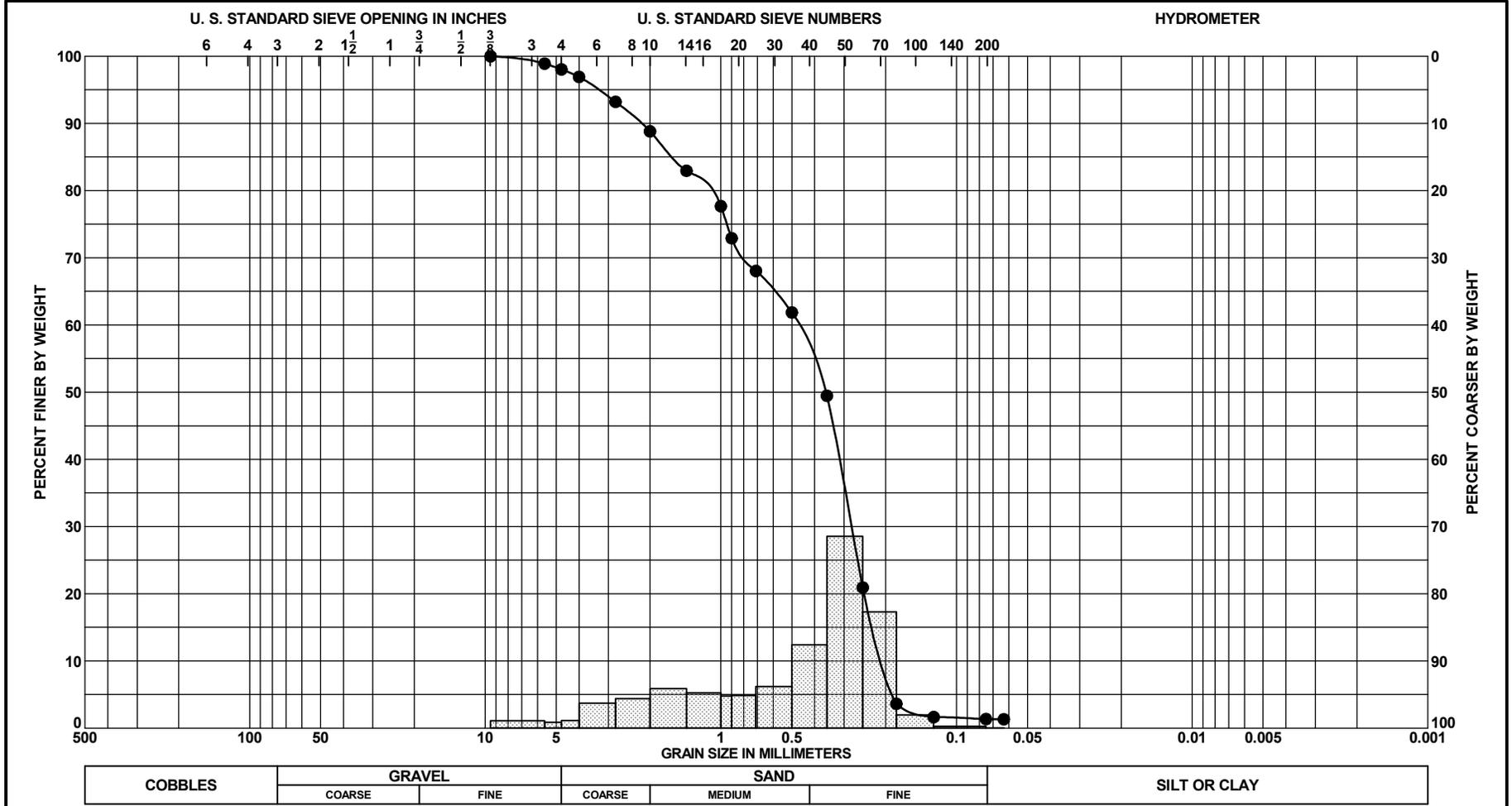






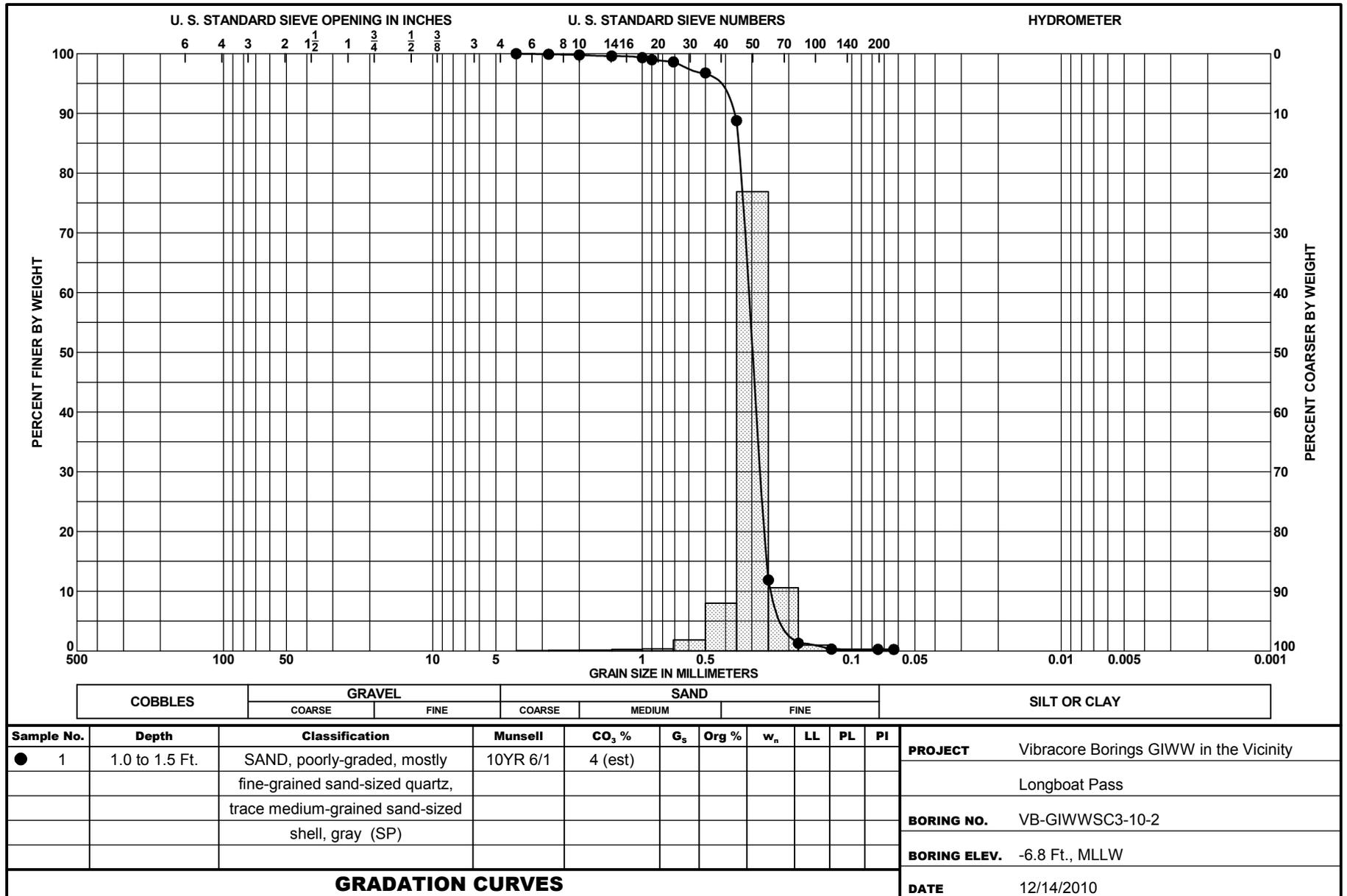
Sample No.	Depth	Classification	Munsell	CO ₃ %	G _s	Org %	w _n	LL	PL	PI	PROJECT	
											Vibracore Borings GIWW in the Vicinity	
● 1-Post	2.0 to 2.5 Ft.	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, white (SP)	10YR 8/1								Longboat Pass	
											BORING NO.	VB-GIWWSC2-10-2
											BORING ELEV.	-5.4 Ft., MLLW
GRADATION CURVES											DATE	12/15/2010



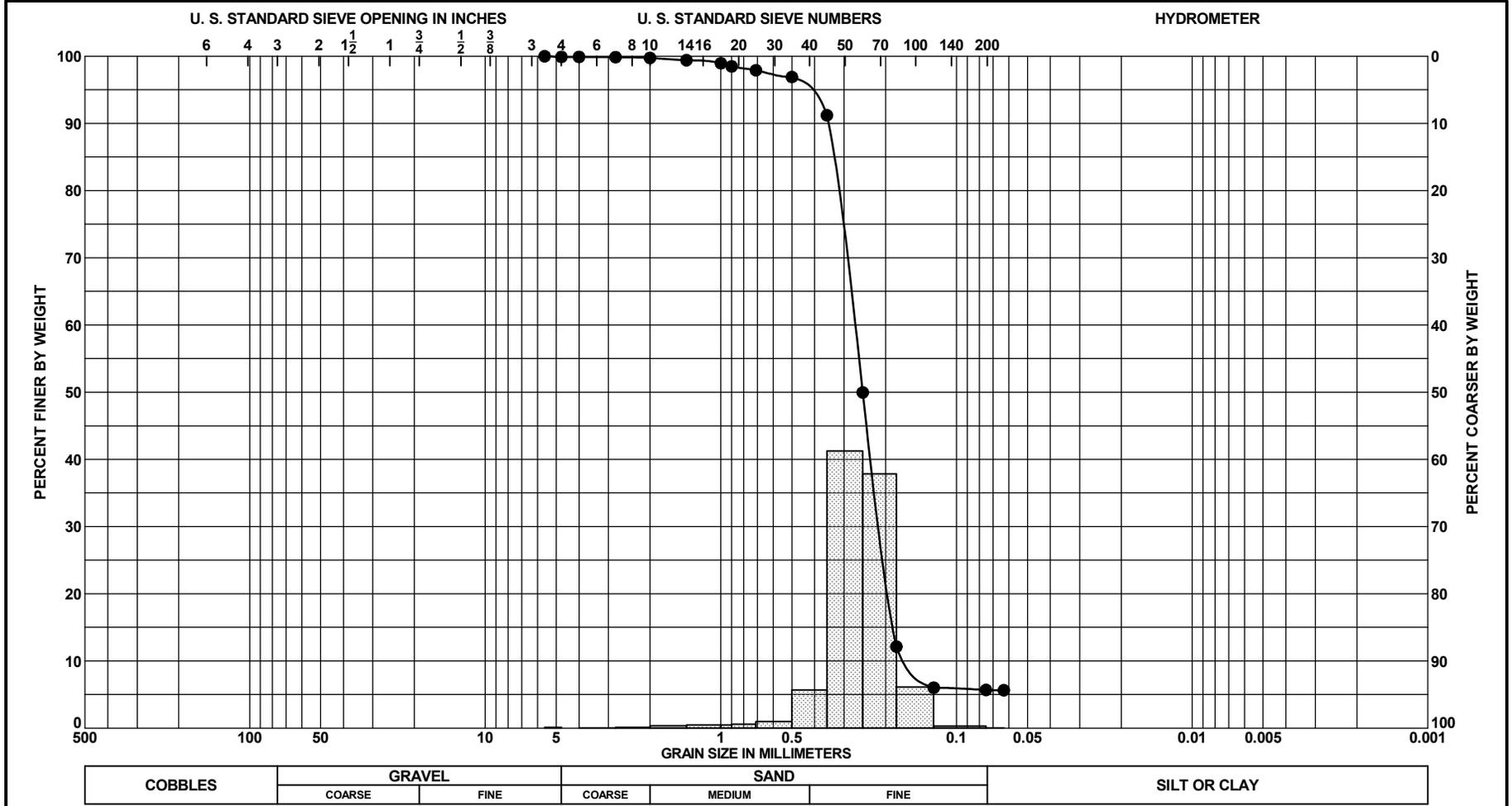


COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

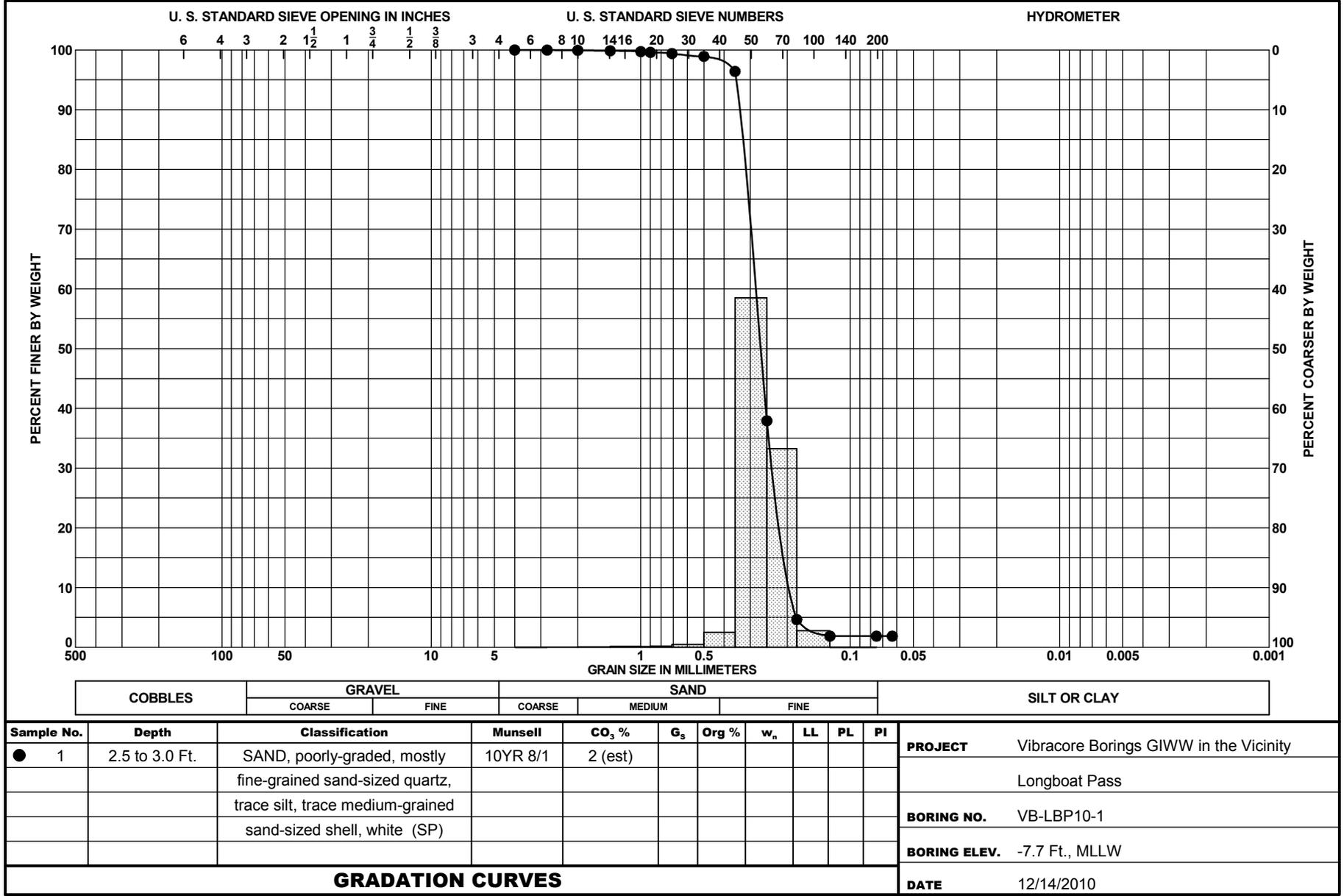
Sample No.	Depth	Classification	Munsell	CO ₃ %	G _s	Org %	w _n	LL	PL	PI	PROJECT
● 1	0.5 to 1.0 Ft.	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, some sand to gravel-sized shell, trace silt, gray (SP)	10YR 6/1	36 (est)							Vibracore Borings GIWW in the Vicinity
											Longboat Pass
											BORING NO. VB-GIWWSC3-10-1
											BORING ELEV. -9.0 Ft., MLLW
GRADATION CURVES											DATE 12/14/2010



Sample No.	Depth	Classification	Munsell	CO ₃ %	G _s	Org %	w _n	LL	PL	PI	PROJECT
● 1	1.0 to 1.5 Ft.	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace medium-grained sand-sized shell, gray (SP)	10YR 6/1	4 (est)							Vibracore Borings GIWW in the Vicinity
											Longboat Pass
											BORING NO. VB-GIWWSC3-10-2
											BORING ELEV. -6.8 Ft., MLLW
GRADATION CURVES											DATE 12/14/2010

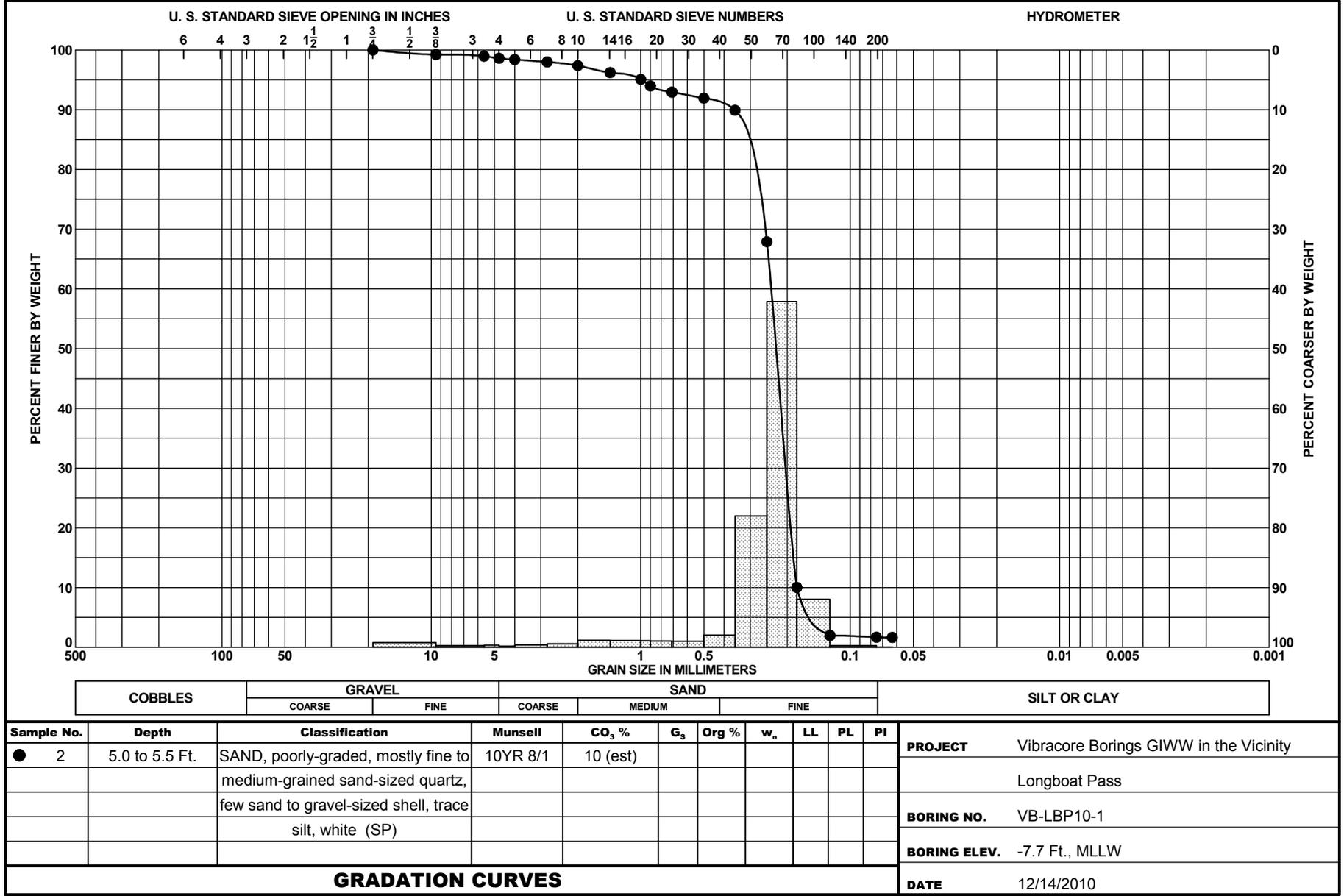


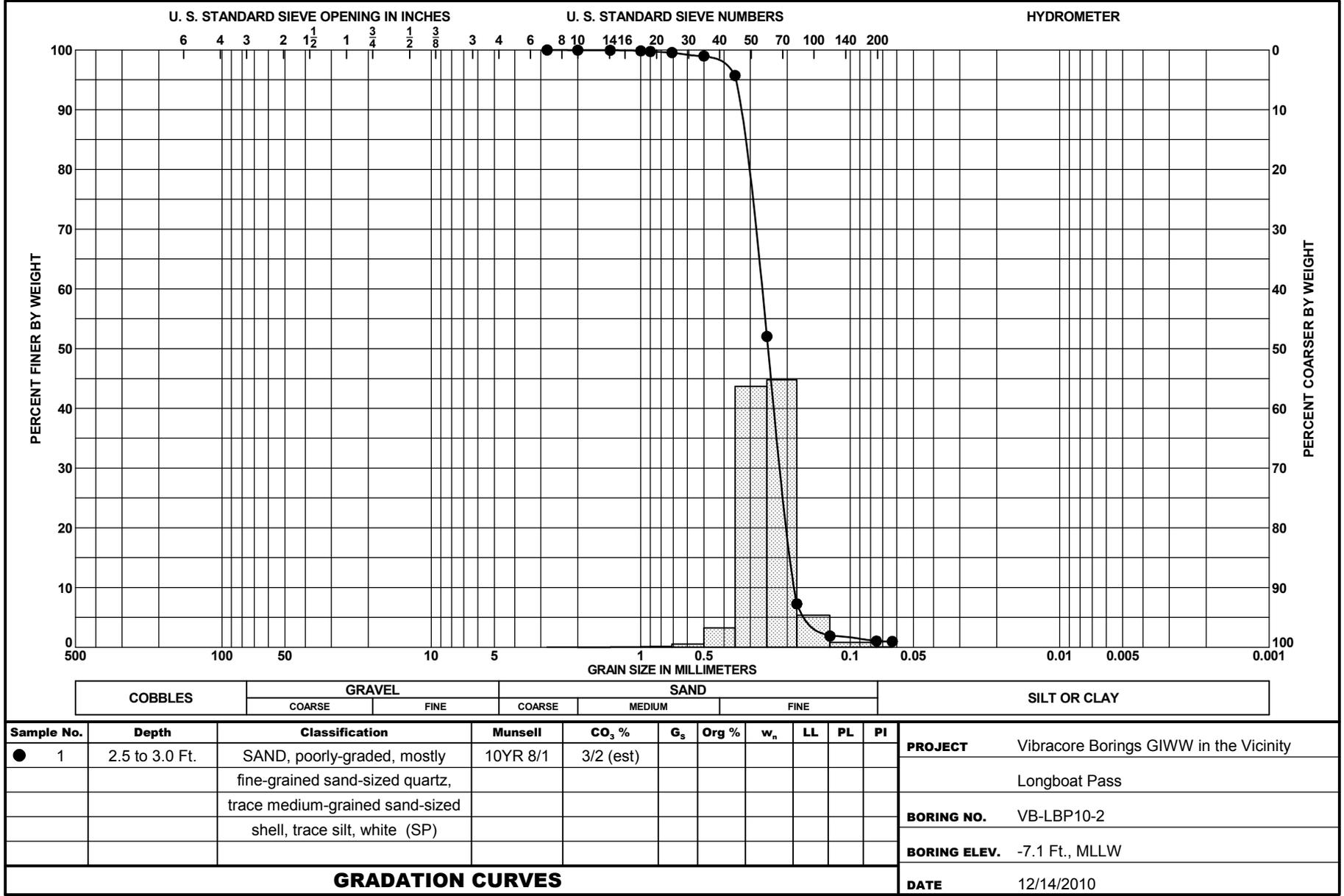
Sample No.	Depth	Classification	Munsell	CO ₃ %	G _s	Org %	w _n	LL	PL	PI	PROJECT
● 2	3.0 to 3.5 Ft.	SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, few silt, trace medium to coarse-grained sand-sized shell, gray (SP-SM)	10YR 5/1	4 (est)							Vibracore Borings GIWW in the Vicinity Longboat Pass
											BORING NO. VB-GIWWSC3-10-2
											BORING ELEV. -6.8 Ft., MLLW
GRADATION CURVES											DATE 12/14/2010



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

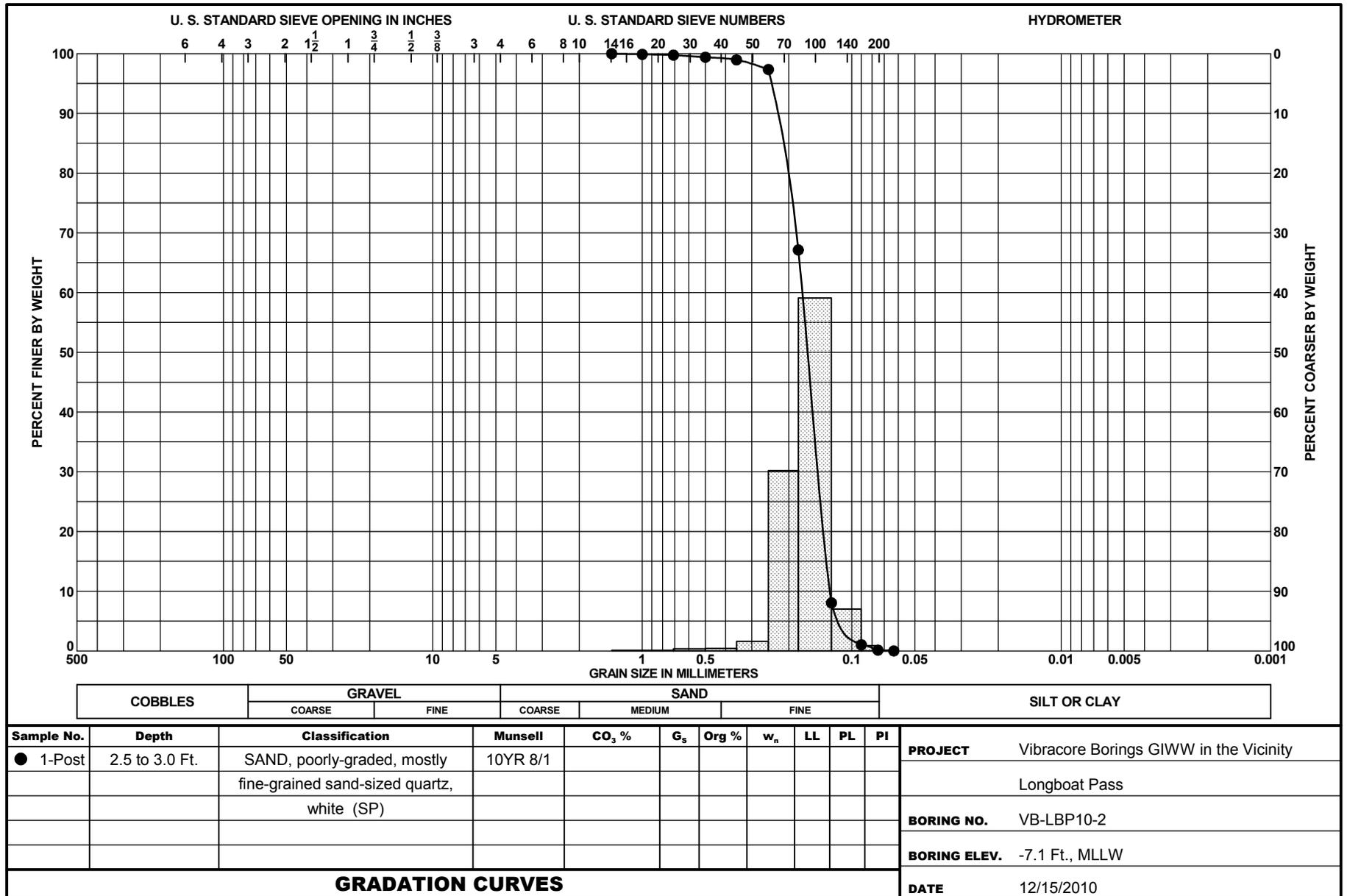
Sample No.	Depth	Classification	Munsell	CO ₃ %	G _s	Org %	w _n	LL	PL	PI	PROJECT
● 1	2.5 to 3.0 Ft.	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace medium-grained sand-sized shell, white (SP)	10YR 8/1	2 (est)							Vibracore Borings GIWW in the Vicinity Longboat Pass
											BORING NO. VB-LBP10-1
											BORING ELEV. -7.7 Ft., MLLW
GRADATION CURVES											DATE 12/14/2010

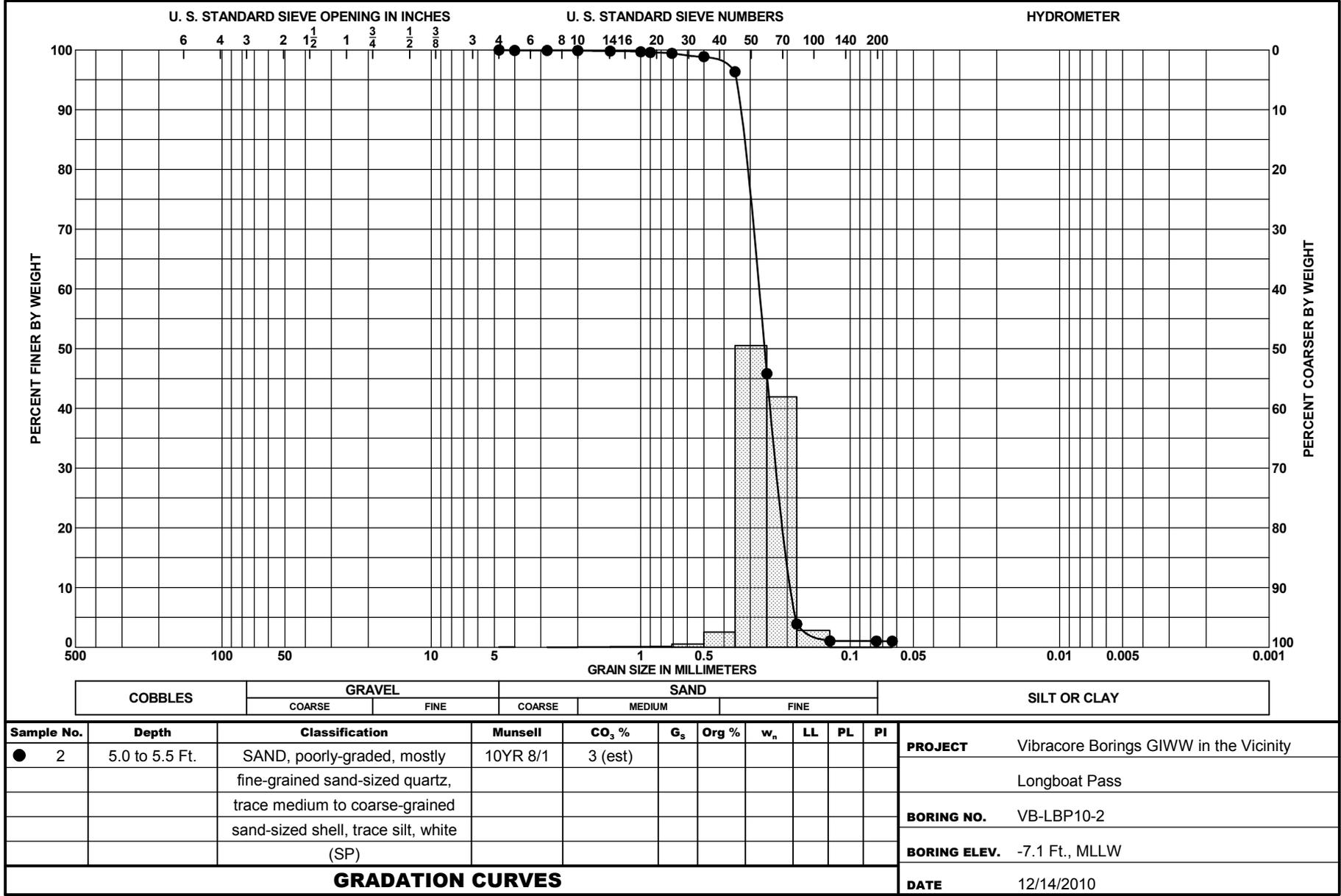


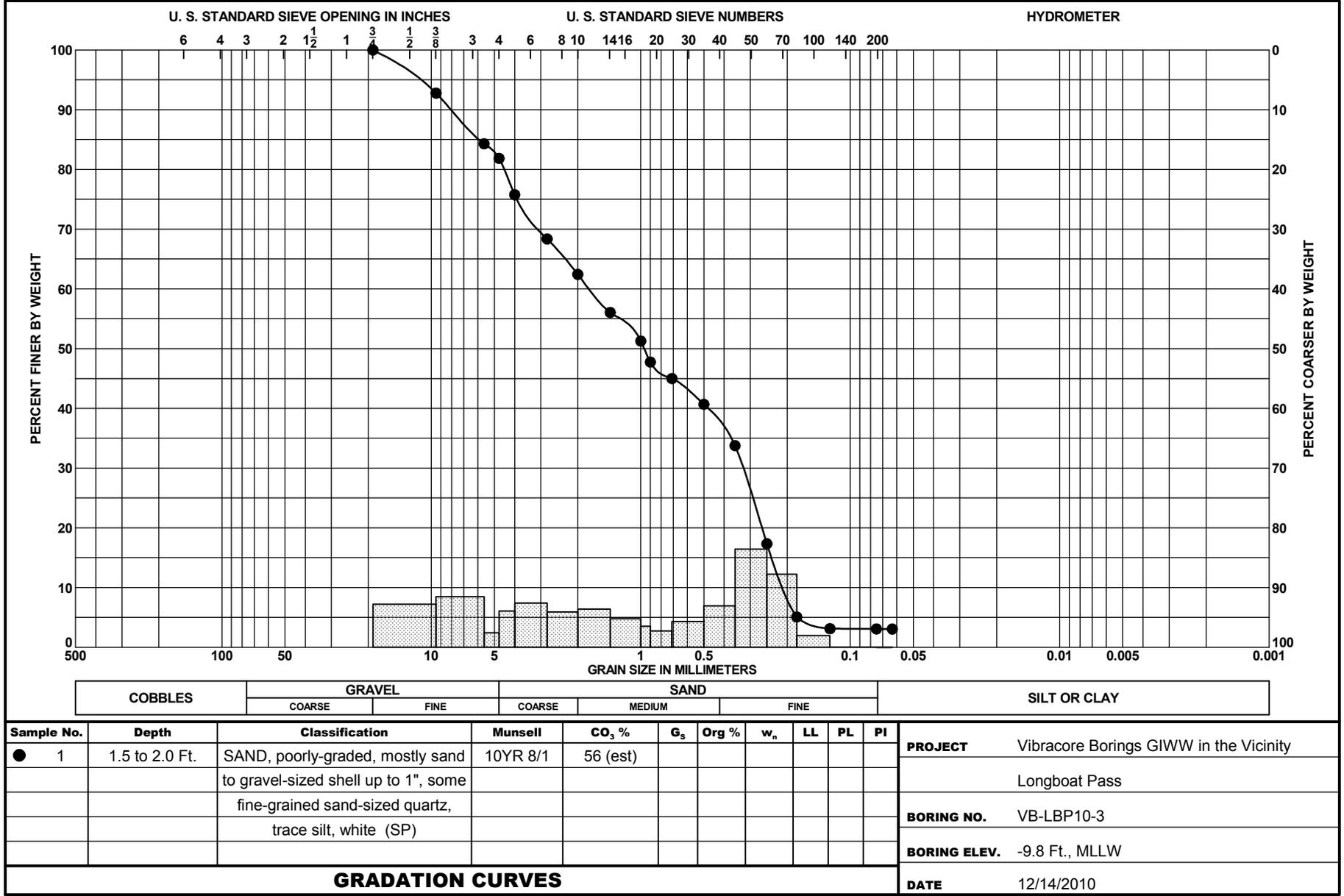


COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Depth	Classification	Munsell	CO ₃ %	G _s	Org %	w _n	LL	PL	PI	PROJECT
● 1	2.5 to 3.0 Ft.	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace medium-grained sand-sized shell, trace silt, white (SP)	10YR 8/1	3/2 (est)							Vibracore Borings GIWW in the Vicinity Longboat Pass
											BORING NO. VB-LBP10-2
											BORING ELEV. -7.1 Ft., MLLW
GRADATION CURVES											DATE 12/14/2010

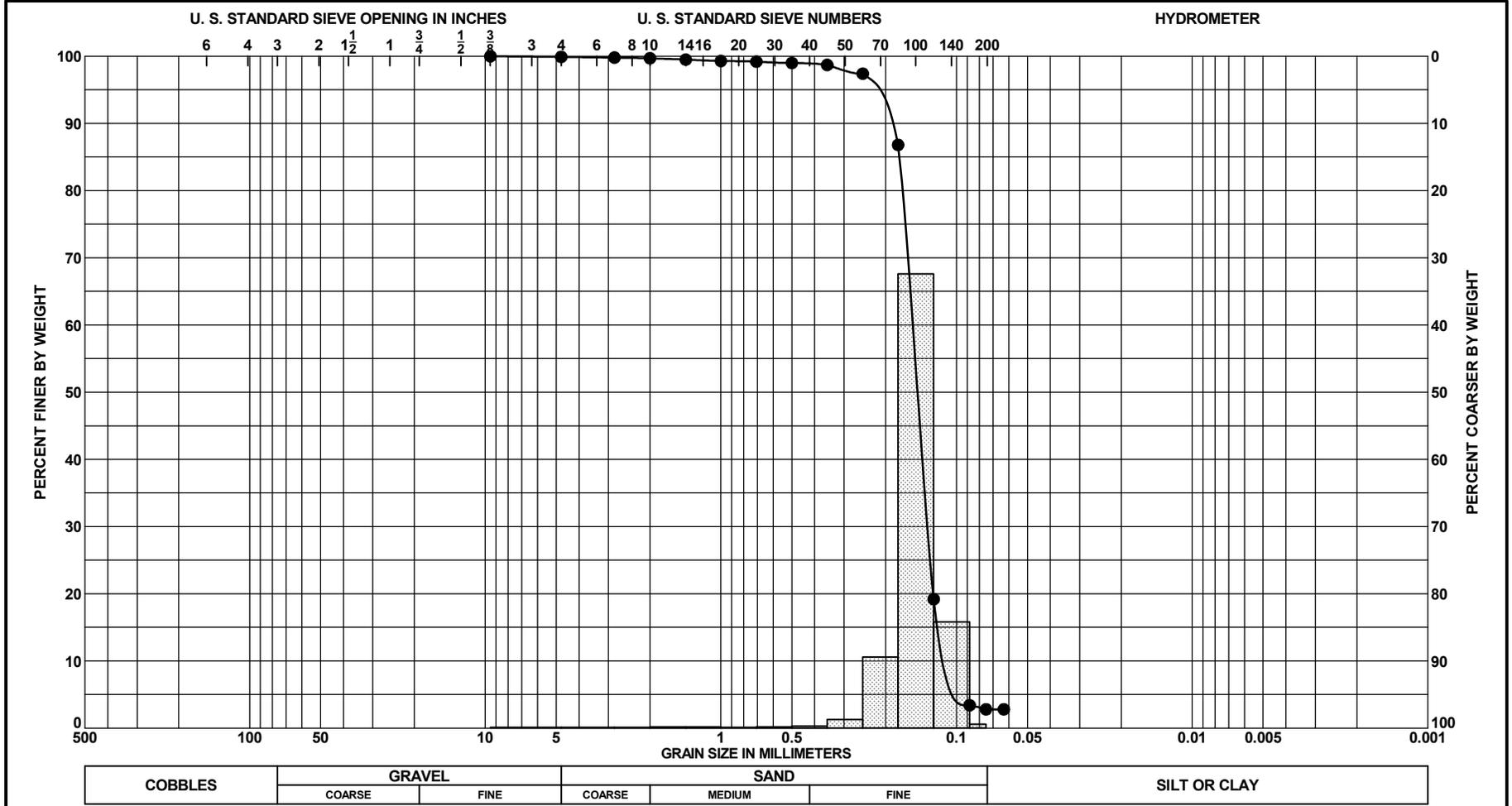




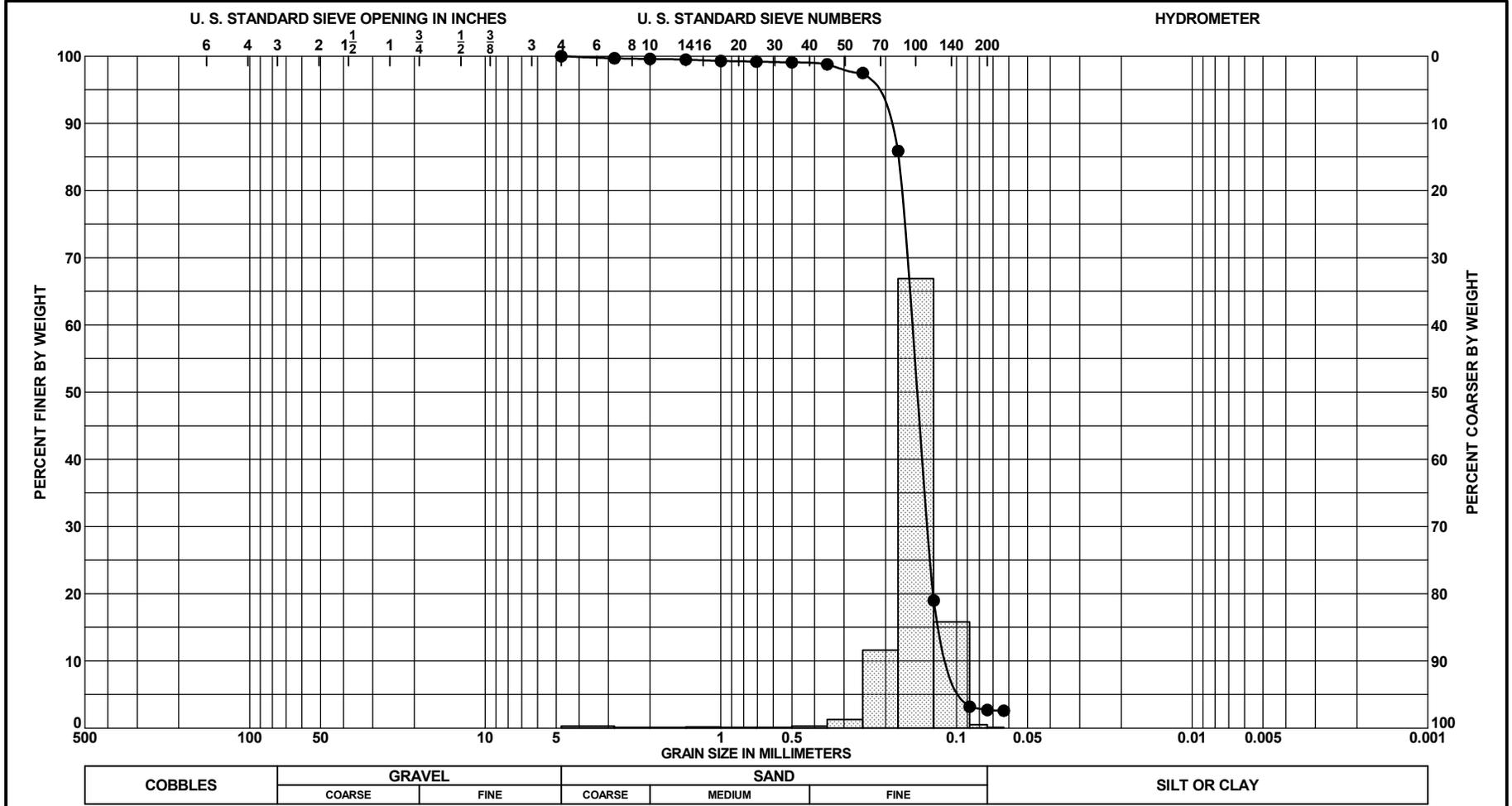


COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

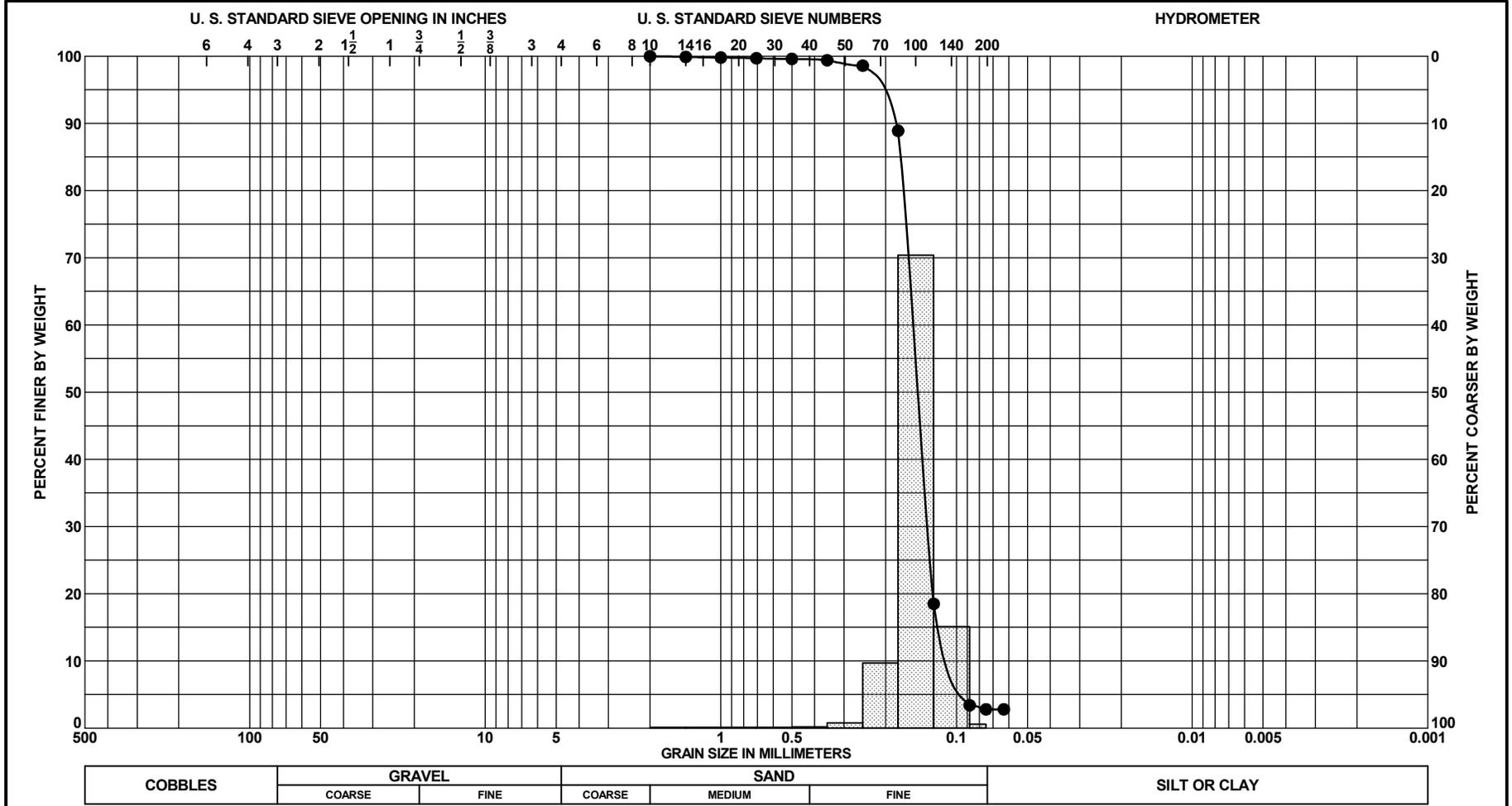
Sample No.	Depth	Classification	Munsell	CO ₃ %	G _s	Org %	w _n	LL	PL	PI	PROJECT
● 1	1.5 to 2.0 Ft.	SAND, poorly-graded, mostly sand to gravel-sized shell up to 1", some fine-grained sand-sized quartz, trace silt, white (SP)	10YR 8/1	56 (est)							Vibracore Borings GIWW in the Vicinity
											Longboat Pass
											BORING NO. VB-LBP10-3
											BORING ELEV. -9.8 Ft., MLLW
GRADATION CURVES											DATE 12/14/2010



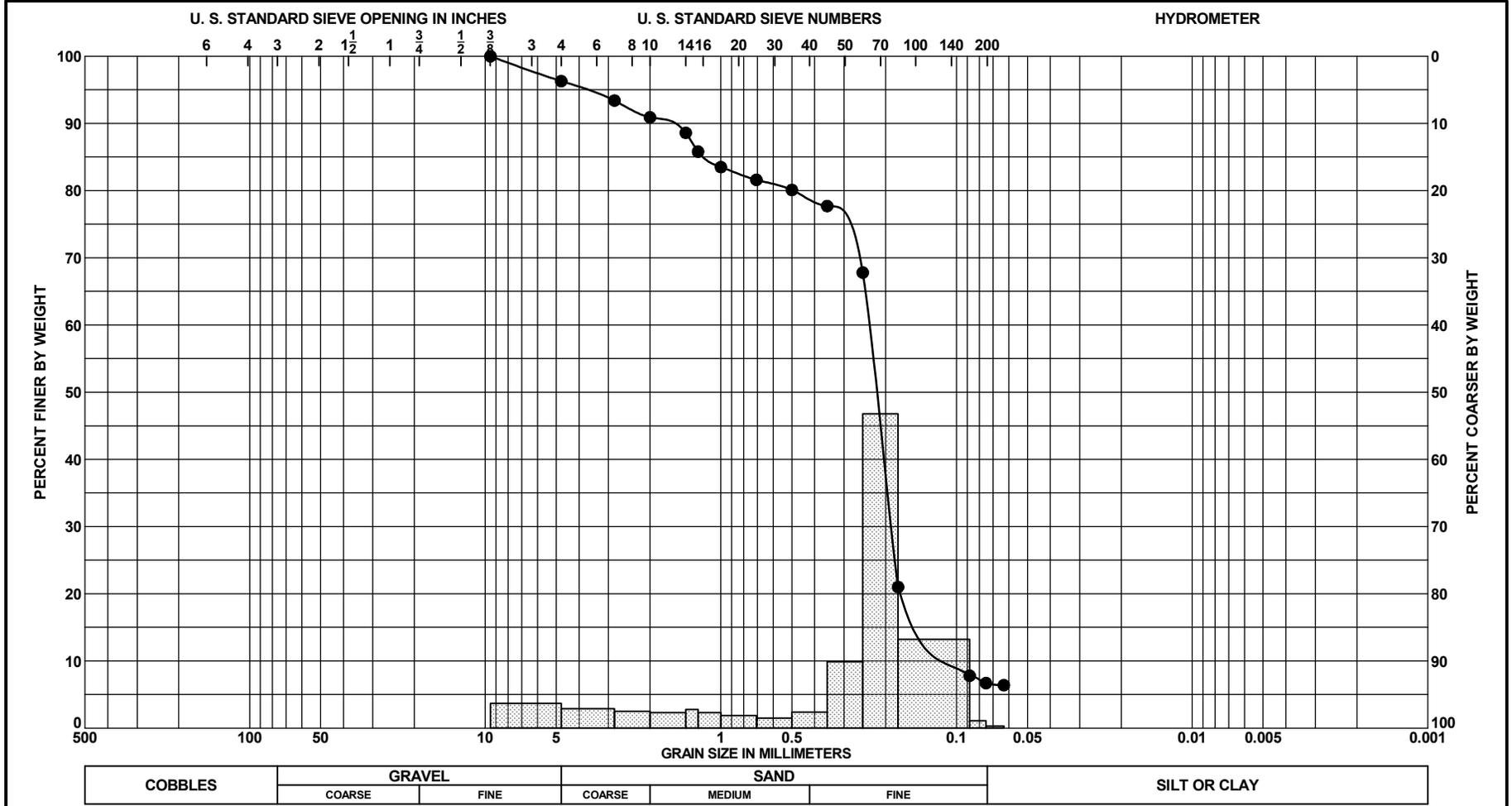
Sample No.	Depth	Classification	Munsell	CO ₃ %	G _s	Org %	w _n	LL	PL	PI	SOIL CLASSIFICATION	
											COBBLES	SILT OR CLAY
● #1	to 21.0 Ft.	SAND, poorly-graded, gray (SP)	5Y 6/1	2/1 (est)								
GRADATION CURVES											PROJECT	GIWW CR to AR
												GIWW Cut M-5
											BORING NO.	CB-GIWW-M5-06-01
											BORING ELEV.	-7.2 Ft., MLW
											DATE	7/25/2006



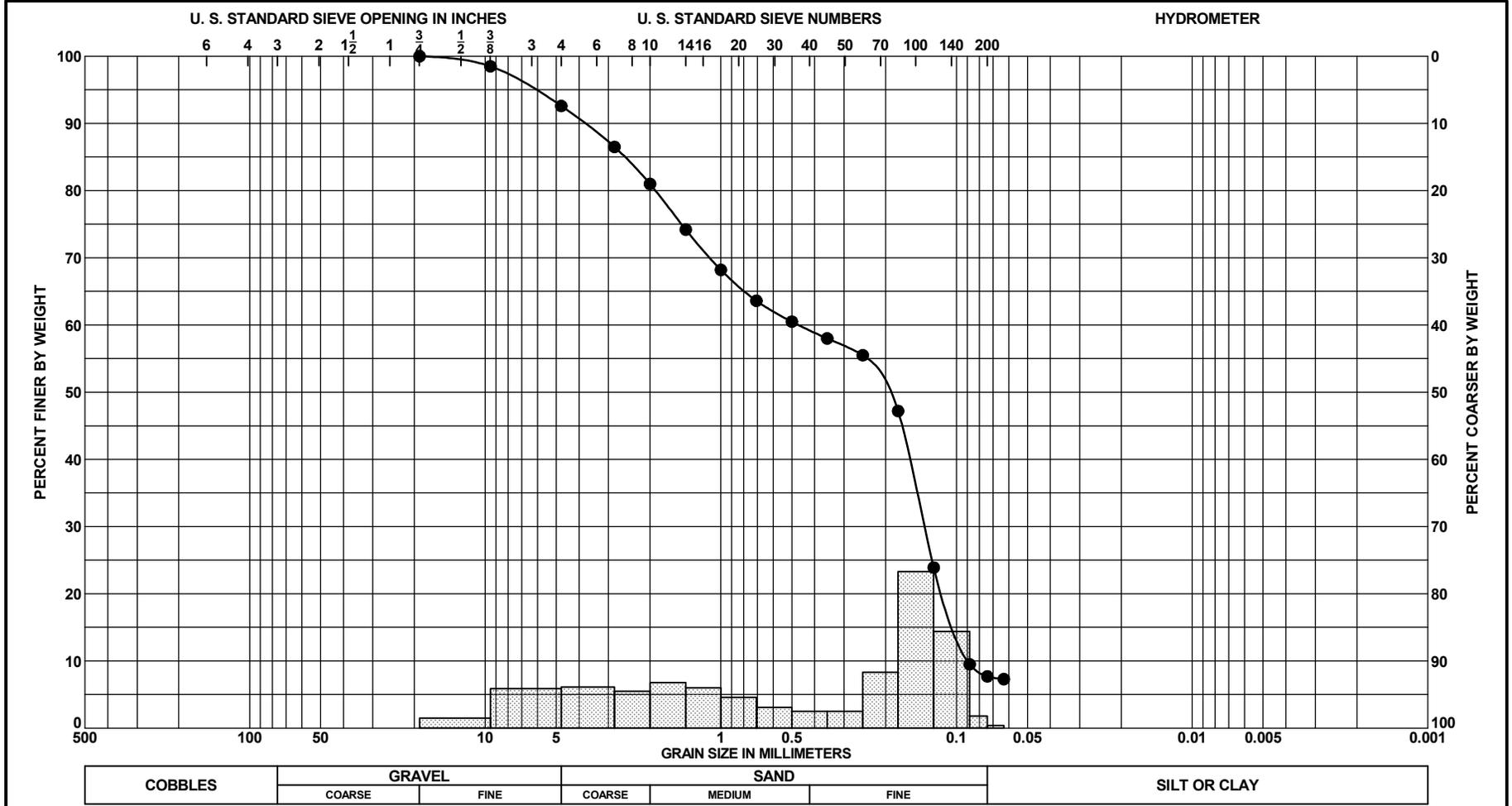
		GRAVEL		SAND									
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT OR CLAY						
Sample No.	Depth	Classification		Munsell	CO₃ %	G_s	Org %	w_n	LL	PL	PI	PROJECT	GIWW CR to AR
● 1	0.0 to 1.5 Ft.	SAND, poorly-graded, gray (SP)		5Y 6/1	1 (est)								GIWW Cut M-5
												BORING NO.	CB-GIWW-M5-06-01
												BORING ELEV.	-7.2 Ft., MLW
GRADATION CURVES												DATE	7/25/2006



COBBLES		GRAVEL		SAND			SILT OR CLAY						
		COARSE	FINE	COARSE	MEDIUM	FINE							
Sample No.	Depth	Classification		Munsell	CO ₃ %	G _s	Org %	w _n	LL	PL	PI	PROJECT	GIWW CR to AR
● 3	3.0 to 4.5 Ft.	SAND, poorly-graded, gray (SP)		5Y 6/1	1 (est)								GIWW Cut M-5
												BORING NO.	CB-GIWW-M5-06-01
												BORING ELEV.	-7.2 Ft., MLW
GRADATION CURVES												DATE	7/25/2006



COBBLES		GRAVEL		SAND			SILT OR CLAY						
		COARSE	FINE	COARSE	MEDIUM	FINE							
Sample No.	Depth	Classification		Munsell	CO ₃ %	G _s	Org %	w _n	LL	PL	PI	PROJECT	GIWW CR to AR
● 6	7.5 to 9.0 Ft.	, gray (SP-SM)		2.5Y 6/1	10 (est)							GIWW Cut M-5	
												BORING NO.	CB-GIWW-M5-06-01
												BORING ELEV.	-7.2 Ft., MLW
GRADATION CURVES												DATE	7/25/2006



Sample No.	Depth	Classification	Munsell	CO ₃ %	G _s	Org %	w _n	LL	PL	PI	PROJECT
● 10	13.5 to 15.0 Ft.	, gray (SP-SM)	2.5Y 6/1	30 (est)							GIWW CR to AR
											GIWW Cut M-5
											BORING NO. CB-GIWW-M5-06-01
											BORING ELEV. -7.2 Ft., MLW
											DATE 7/25/2006

GRADATION CURVES

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GIWW - LONGBOAT PASS ENVIRONMENTAL ASSESSMENT

APPENDIX H

MITIGATION ASSESSMENT

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APPENDIX H – MITIGATION PLAN GIWW-Longboat Pass Cuts M-5 and M-14

The following mitigation plan complies with the requirements of Section 2036 of the Water Resources Development Act of 2007 (WRDA 2007) and “complies with the mitigation standards and policies established pursuant to the regulatory programs”.

1.00 Monitoring

Seagrass development will be characterized by species composition and quantified through determination of aerial coverage and vegetative characterization. This assessment will be accomplished through the following measures described below.

- Aerial mapping will be acquired to provide a general overview of the restoration area. The mapping will be acquired by aerial flight by the Corps- owned unmanned aerial vehicle (UAV) equipped with high-resolution (Olympus 10-megapixel digital single lens reflex camera). The UAV will be flown at an elevation of around 50-feet above the water in transects that overlap by 60%. The aerial will be calibrated as needed and ortho-rectified to compose a seamless mosaic with coverage of the entire study area including all the individual restored injury sites. Aerial photo-interpretation will be used to confirm new growth of seagrass species in contrast to exposed sediment tubes within the restored injury sites. See attached brochure regarding the UAV specifications.
- Ground-truthing activities will be conducted in addition to aerial data collection. In-water manual dived surveys will include reconnaissance of restored injury sites for qualitative sampling through transects. As most injury sites are linear features that are narrow in width, transects will be along the axis of the feature instead of perpendicular across the width. DGPS positions will be collected at the beginning and end of the features. A diver will swim the centerline of the axis noting the linear extent of substrate within a 1-meter wide area. The assessment of bed density and species composition will be performed through line-intercept and point quadrat samples for each survey. In addition to assessment of the density and coverage by establishing vegetation, the restoration areas will be evaluated for evidence of scour, additional injury or significant problems that could prohibit the growth of seagrass shoots within the interior of the

sites. The modified Braun-Blanquet method will be employed as described below. Qualitative evaluation includes seagrass species composition of either single or mixed species. Also, determination of the substrate material and exposure will be calculated along with the seagrass categories assigned for percent total coverage from <25%, 25 – 50%, 50 – 75%, and >75%.

- Modified Braun-Blanquet visual assessment method
This method is often used to monitor seagrass beds in south Florida (Dunankl et al, 2002; Fourquaran et al, 2002). To accurately describe seagrass coverage, as well as document changes in the density coverage, a quantitative assessment will be performed. A number of point-intercept quadrat samples will be evaluated in selected locations within the restoration area that fully represent the restored injury sites. This will be determined by the number of 50 cm x 50 cm standard quadrats that are required to comprise 5% of the restoration area for each restored injury site. Divide the injury site into the same number of sections as quadrats required to obtain the 5% coverage. For each section, the survey will generate a random point (via GIS). Each point will become the location for placement of the Braun-Blanquet quadrat. Photograph and/or video of each location will document the current condition at each site. New random sites will be generated prior to each monitoring event.
- Density of aerial coverage by developing shoot growth will be evaluated within the restoration site(s) as well as adjacent reference site(s). Density is based on the fraction of the quadrat dominated by a particular species when viewed directly from above. Density is used as an indicator of seagrass health and establishment. Density composition is determined by counts of shoots within a sub-plot, (25 cm by 25 cm), placed within the 50 cm x 50 cm standard quadrat.
- Reference sites are established adjacent to restored injury sites for comparison purpose. Reference sites will assist in establishing success criteria (coverage and density) that can reasonably be expected for this restoration project. Reference sites include undisturbed sites with established seagrass beds for determination of a success criteria goal. Through comparison, reference sites can determine if background impacts exist that are not related to the injury or failure of the restoration activity, such as degraded water quality or disease affecting natural re-colonization or sprouting of seeded plants.

2.00 Criteria for Ecological Success

Success Criteria provides the basis of established plant growth that is documented to have unassisted persistence for at least two consecutive years within the restored injury site(s) (Fonseca et al, 1998). The criteria for a successful basis of comparison include:

- Areal coverage of seagrass colonies within 15% of that in reference site within the first 6 months of reestablishment.
- After 12 months of post-construction, 45% of vegetative coverage overall will be expected within the restoration site.
- At the end of the second year, a total of 85 % coverage will be expected at the restoration site for success determination.

Success determination will be accomplished by counts of plant shoots and estimation of percent coverage within sample quadrat and sub-quadrat to determine density and percent coverage (in contrast to bare areas). The success criteria for vegetation establishment within restored areas include:

- Braun-Blanquet score within 1 unit of reference site; and
- Contingency measures as part of the Adaptive Management Plan will be implemented if indicators determine that success criteria are not being met, and that the restoration is determined to be failing.

Other items for inclusion of success criteria include:

- Substrate material (including benthic assessment)
- Light penetration
- Depth of water at MLW
- Wave action
- Temperature/ Salinity
- Proximity of restoration site within seagrass-dense habitat for recruitment resource
- Wildlife utilization

3.00 Lands and Interests

No additional lands will be acquired by the US Army Corps of Engineers or Co-sponsor as a component of this mitigation plan.

4.00 Description of Mitigation

Submerged aquatic seagrass colonies occur within federal channels of the proposed project area where dredging will occur and on the immediately adjacent buffer, see Figures 1, 2, and 3.

The search for available candidate sites was researched by contacting Sarasota Bay Estuary Program, University of South Florida, Mote Marine Research Laboratory, and Hillsborough County ELAPP Conservation Services. The Big Pass site was offered by Hillsborough County as a candidate site as it contains sufficient prop scar and blow-out injuries located in a dense seagrass bed sub-aquatic community. The site has significant need of restoration; thus, the US Army Corps of Engineers has the opportunity to contribute to the community as well as compensate for impact to seagrass within the Tampa Bay Watershed.

Both the GIWW-Longboat Pass Maintenance and Big Pass Seagrass Restoration project sites are within the Tampa Bay Watershed. The impact site is within both a designated Outstanding Florida Waters and Sarasota Bay Aquatic Preserve; the restoration site is within a designated Outstanding Florida Water, as well as Cockroach Bay Aquatic Preserve.

The proposed mitigation site is located in a habitat of marine seagrass beds having similar substrate of silty-sand composition and elevation, light penetration, and salinity, but contains numerous injury sites of prop scars and blow-out from vessel groundings. Prop scars are formed in seagrass beds that have been stripped of plant life as a result of a motored vessel propeller coming into contact with the estuary substrate. This collision with the bottom not only removes the topical plant material, but also slashes underground rhizomes and roots. A blow-out occurs when the hydraulic action of a propeller wash forms a large divot in the substrate, consequently removing vegetation. These types of injuries provide opportunity for sub-aquatic restoration by repairing the substrate to the correct elevation with similar material and allowing natural recruitment of native seagrass species to occur. Signage should be placed around the perimeter where the restoration beds occur collectively, which will protect a larger zone of seagrass, including the restoration sites.

4.01 Types and Amount

Direct/Indirect permanent impact requiring compensation for the GIWW – Longboat Pass maintenance dredging project will encompass a total 0.34 acre. Seagrass within the Federal channel will be permanently impacted through

removal during the dredging process. Side slope areas containing seagrass colonies immediately adjacent to the Federal channel will be evaluated post-dredging to determine if temporal impact has occurred.

The Uniform Mitigation Assessment Methodology (UMAM), attached, was used to determine the credits needed to compensate this impact within the project area. The UMAM analysis determined the Functional Loss from direct and indirect impact to be 0.159 credits. A Relative Functional Gain was found to be 0.244 credits.

The completed UMAM determined 0.65 acre of mitigation, (approximately 2:1 ratio), will be required to fully compensate for the direct loss of seagrass colonies within the proposed dredging area. Please see attached data for UMAM calculation.

The proposed mitigation site is in the Big Pass estuary of Cockroach Bay and was chosen to restore seagrass colonies due to extensive opportunity from injury sites. According to the Hillsborough County Conservation Service, this area contains over 600 injury sites within a matrix comprised of like-species as those found in the impact zone. The site will be able to replicate existing conditions as found at the impact site.

4.02 Physical Action Undertaken

The following includes a description of the general region where impacts are expected to occur, and site where restoration will be conducted.

Description of Project site

The Federal channels associated with the project site (GIWW Cuts M-5, M-12 and M-14, Longboat Pass Cuts 2 and 3, and Sunshine Skyway Cuts 2 and 3) are actively utilized by small to large motorized and non-motorized vessel traffic. Adjacent land use consists of moderate to heavily residential, commercial and recreational park development. The aquatic environment that includes the proposed channel cuts to be dredged and their immediate buffer contain 0.34 acre collectively of turtle grass (*Thalassia testudinum*), shoalgrass (*Halodule wrightii*), and manatee grass (*Syngodium filiforme*) among disturbed areas of the substrate. Concentration of seagrass occurs in GIWW-Cut M-5, Figures 1 and 2. Most of the seagrass beds are located outside of the Federal channel where no disturbance is proposed by the maintenance activities. A minimal amount of seagrass (1020 sq ft) occurs in the channel of GIWW Cut M-14, Figure 3.

Light penetration is considered moderately high which allows extensive colonies of seagrass to grow in areas undisturbed by boat traffic. Sand and silty sand comprise the substrate in and near the channel which is conducive to healthy seagrass habitat (Fonseca *et al*, 1998). Tidal action is moderate, with an average difference of 1.5 feet from mean low to mean high water level. Salinity is moderate. The GIWW – Longboat Pass is considered to be within a designated water impairment area due to the contribution of non-point pollution from nitrogen, phosphorus and bacteria associated development and untreated stormwater runoff.



Figure 1. Seagrass beds occurring at the north end of GIWW Cut M-5 of Project Area. Note that the majority of seagrass occurs outside of the proposed dredge area in the buffer which will not be disturbed.

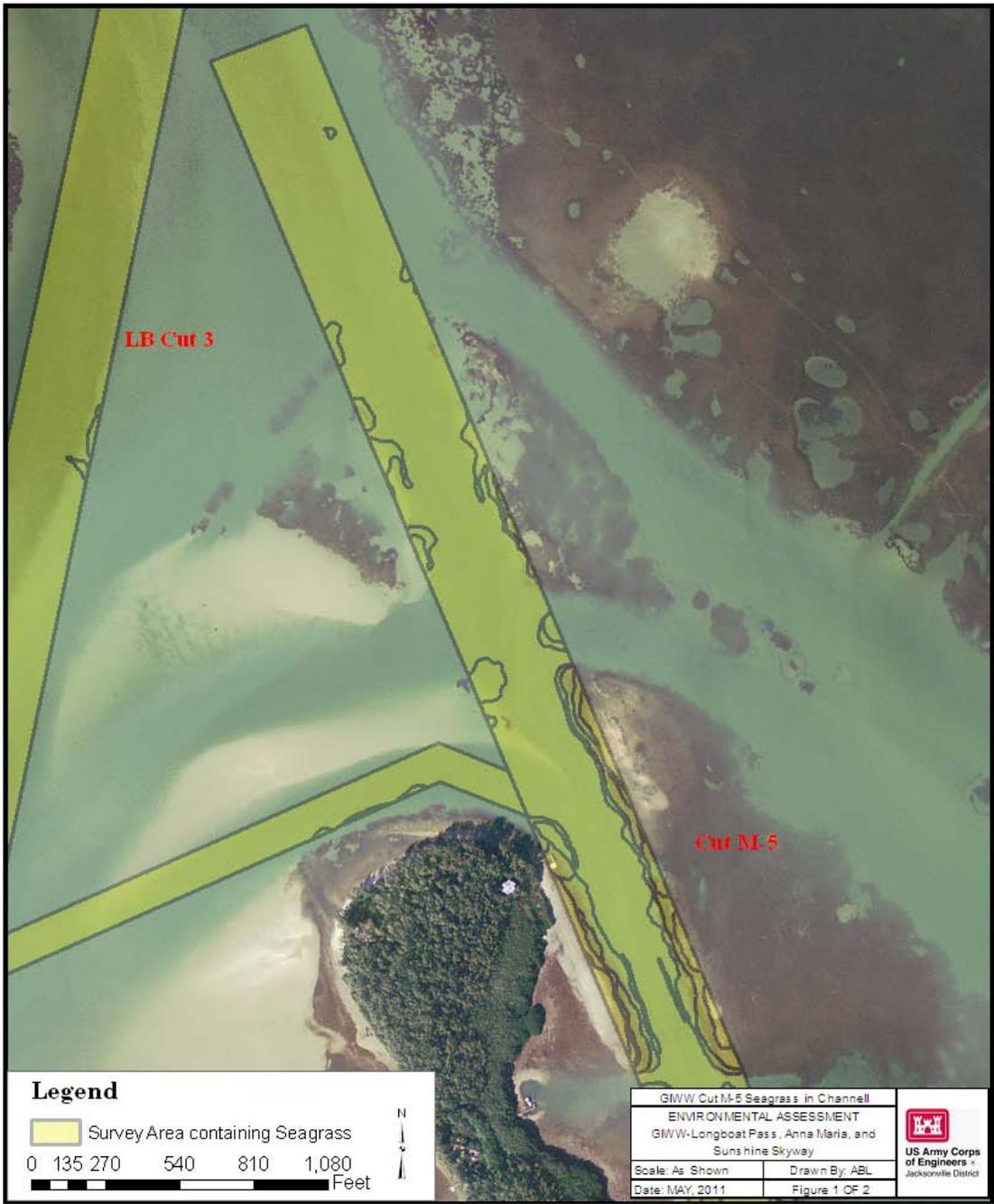


Figure 2. Seagrass beds occurring at the south end of GIWW Cut M-5 of Project Area. Note that the majority of seagrass occurs outside of the proposed dredge area in the buffer which will not be disturbed.

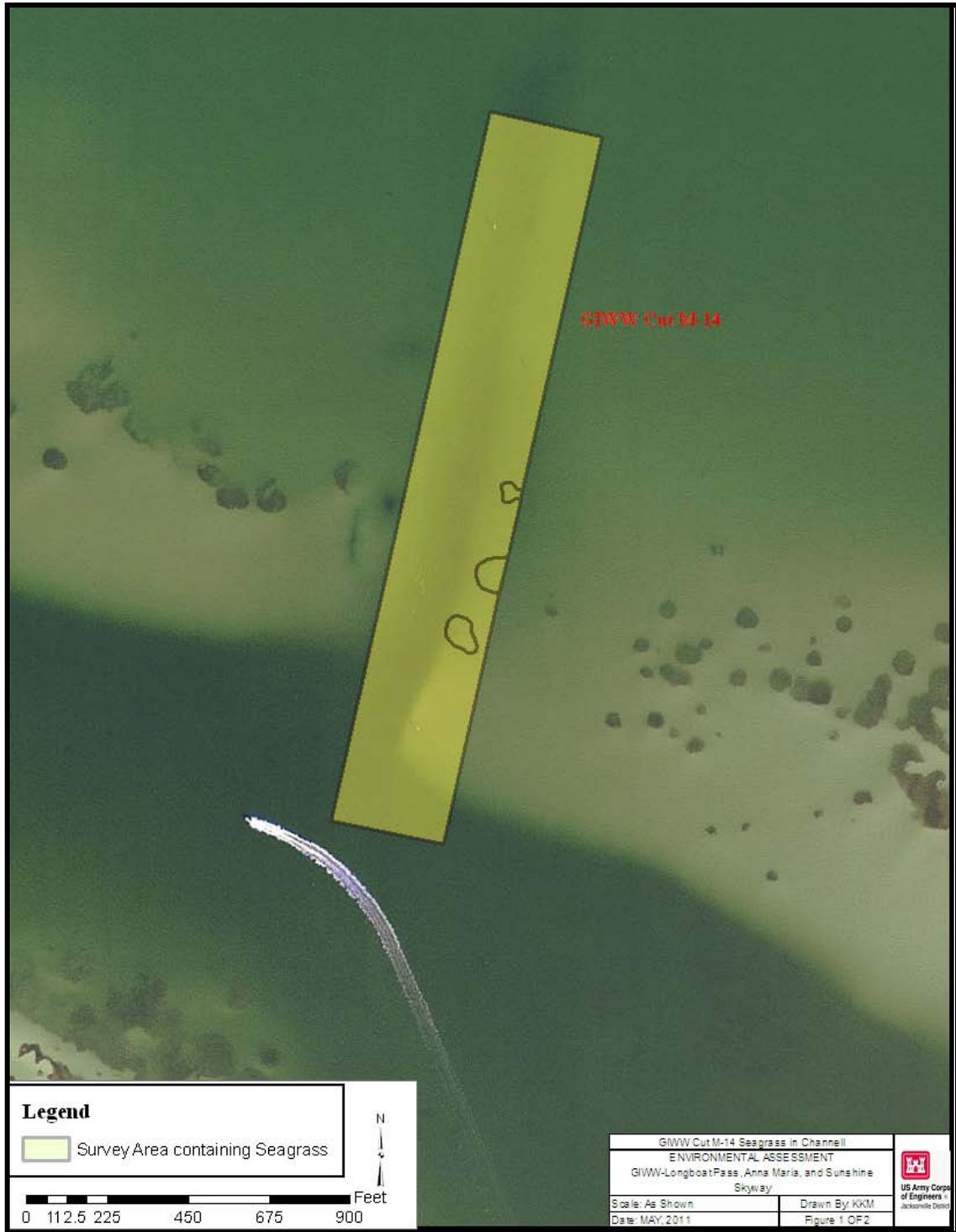


Figure 3. Seagrass beds occurring in GIWW Cut M-14 and immediate buffer. The amount of seagrass that occurs within the proposed dredging of the Federal channel is 1020 sq ft.

Description of Mitigation Site

Big Pass is located in Tampa Bay, immediately south of Little Cockroach Bay, in Hillsborough County. This site is in a still-water environment, surrounded by mangrove, with protection from severe tidal wave action. The pass is isolated from shoreline urban development, and has unmaintained direct access to Tampa Bay and ultimately, the Gulf of Mexico. It is used for recreational boating and fishing. No change in the site's use is expected to occur as a result of the mitigation action. The site is located approximately 12 miles from the GIWW – Longboat Pass project site. Tidal action is similar to the project site. Water quality is moderate to high; the site is not included in a designated water impairment zone.

Big Pass has a seagrass-dominated substrate that contains approximately 600 injury locations from vessel prop scars; see Figure 4, (personal communication, Hillsborough County Conservation Services). Injury sites vary in configuration, size and spatial extent. Typically, prop scars are linear features that can range less from than 10 feet in length to several hundred feet and average about 2-ft in width, see Figure 5. Blow-out injury features are typically round features that also vary by size and configuration. The matrix surrounding the injury sites are comprised of moderate to dense seagrass bed. Collectively, these sites will provide restoration sites spatially in excess of the 0.25 acre needed to adequately compensate for impact loss from the project area, according to James R. Sullivan, Hillsborough County Conservation Services. The expected seagrass that occur in Big Pass includes turtle grass (*Thalassia testudium*), shoal grass (*Halodule wrightii*), manatee grass (*Syngodium filiforme*), widgeon grass (*Ruppia maritima*), and Engelmann's seagrass (*Halophila engelmannii*) (US Army Corps of Engineers, 2002). No dredged channel exists within Big Pass for unobstructed access by large or medium motorized boat access, although a public boat ramp and channel access to Tampa Bay is located about 0.5 mile south near Camp Key.

Currently, the Big Pass area is a designated manatee protection zone, with a boating "no-wake" zone posting. Enforcement of this mandate is not fully practical. Although a protection zone for seagrass restoration sites will be addressed through signage for safe navigation, no change to the use of Big Pass for recreation is expected to occur as a result of restoration of seagrass in this location.



Figure 4. Big Pass proposed mitigation area for seagrass bed restoration within injury sites



Photo courtesy of Hillsborough County Conservation Services

Figure 5. Detail of area within Big Pass depicting a typical zone of prop scar injury sites

Description of Construction Technique

Sediment replacement will be used to restore seagrass injury sites, which are characterized as below-grade unconsolidated bottom depressions. This sediment will provide stabilization to the restoration area and also topographic relief needed to achieve conditions to promote growth of shoots. The expected performance criteria for proposed substrate material will consist primarily of sand (approximately 60%), and to a lesser extent (up to 40%), silty-sand containing shell fragments or small pebbles. An upland source of acceptable material will be sought, which would include material having a similar composition from a local quarry.

Sediment Tube® technology will be employed to securely place the material into the injury locations (Seagrass Recovery, Inc website). The use of biodegradable sediment-filled mesh fabric tubes placed inside the prop scar trench is an efficient method for reducing erosion rates in injury sites while reducing turbidity

during construction operation (RS Environmental Consulting, Inc, 2010). The Sediment Tube® provides the conditions needed to encourage natural re-colonization of the injured areas by neighboring seagrass. The tubes are versatile in size and configuration, and can conform to the shape of the injury site. They may be stacked to achieve the desired elevation, and can also be laid end-to-end in order to expedite recovery (Seagrass Recovery, Inc website). In order to give a head start to seedling germination, the tubes will also be pre-seeded with desirable species that will promote rapid colonization. As sprouts become reestablished, the tubes simply breakdown under natural conditions. This process typically takes 12 months for the sediment tube material to breakdown (Seagrass Recovery website). Fully restored seagrass can be expected between 12 to 18 months after seeded Sediment Tube® placement (RS Environmental Consulting, Inc, 2010).

Bird stakes may also be used to facilitate the re-growth of seagrass shoots within the injury areas by boosting nutrient from feces, a natural fertilizer. Cross-barred stakes of ¾-in PVC and wood will be placed in water less than 3 feet of depth and will prevent dilution of the feces; thus, keeping the concentration of nutrient at the site where vegetation development is occurring. This method has been shown to be effective for both seeded and naturally recruiting injury sites (J.W. Kenworthy, *et al*, 2000). Placement configuration and interval is dependent upon the width and length of the injury site, and depth of water. Typical duration for the stake placement at the injury site is 18 to 24 months. The stakes can also be used for signage designating navigational hazards to prevent further impact from boat grounding.

4.03 Purpose, Functions, and Values

Purpose and Goal of the action:

Impact to seagrass beds are expected to occur as a result of the dredging maintenance activity. Due to the long-term interval since the last maintenance event, estimated to be more than 30 years ago, the Corps is proactively pursuing a mitigation measure to compensate for the permanent loss to seagrass within the Federal channels, and temporal loss for those within the buffer that occur from side-slope slumping during dredging.

Functions and Values to be transferred from the impact site to the restoration site are several. Seagrass beds provide unique marine habitat which are extremely productive and a major contributor to the nearshore ecology of the ocean. Seagrass provide a variety of benefits to the marine environment by enhancing sediment stability, decreasing wave energy, improving water clarity, and creating habitat and substrate diversity. They also provide feeding grounds for fish and

invertebrates species, which in turn, provide resources for wading and diving birds, as well as food resource for the West Indian Manatee (*Trichechus manatus*).

The mitigation project will occur several miles from the impact site, within the same watershed, and also within a Florida designated Aquatic Preserve (Cockroach Bay Aquatic Preserve). The mitigation will be an “in-kind” restoration of seagrass at a 2:1 ratio in a location of seagrass habitat receiving previous injury. Restoration of the injury sites will replace the function and value that was lost by the injury, as well as that of the impact site.

Therefore, no loss of function or value provided by seagrass in a sub-aquatic habitat will occur. This is further supported by the completed UMAM analysis.

5.00 Adaptive Management Plan

In the event that restoration measures fail to meet the goals as established by the success criteria as documented by monitoring event data, Adaptive management measures will be enacted and include:

- Replace sediment tubes that have not stabilized the injury site(s), as indicated by the lack of seagrass seedling sprout or shoot growth, loss of areal coverage by target species, subsidence, or subsequent injury to sediment tubes or substrate.
- Replant seagrass species by shoot transplanting or re-seeding.
- Replacement of bird stakes that may be missing or damaged
- Utilize additional injury sites that show more promise of successful establishment than those currently in use
- Additional monitoring events or prolonged schedule until success criteria is documented as accomplished

6.00 Entity Responsible for Monitoring

All monitoring associated with this mitigation plan will be completed by or under the direction of the US Army Corps of Engineers; if the monitoring event is completed by a third party, this activity will be conducted under the direction and on behalf of the US Army Corps of Engineers. Therefore, the US Army Corps of Engineers will retain total responsibility of all activities related to the monitoring of this mitigation.

7.00 Monitoring and Consultation with Federal and State/Commonwealth Agencies

7.01 Monitoring Frequency and Schedule

Once constructed, the mitigation effort will be monitored until it is considered a success in consultation with appropriate Federal and state agencies, and is released from further monitoring requirement.

Monitoring Schedule

- The duration of monitoring is expected to span three years, unless failure determines the need for activation of the adaptive management plan, consisting of replanting or repair of injury sites. A baseline event will be conducted immediately upon completion of restoration activities. The first and second year events will occur semi-annually at 6 and 12 months. The third year event will occur one year after the second semi-annual event.
- Should the system fail to reestablish seagrass colonization at the expected rate, it likely will be evident by the end of the second year. If adaptive management measures of replacing sediment tube or re-planting are deemed necessary, the monitoring event schedule will start over to a semi-annual survey for a period of at least one year for those sites requiring additional attention. If additional annual monitoring events are required, these could be conducted for up to five years as necessary.

7.02 List of Federal and State Agencies to be consulted

The fish and wildlife resource agencies listed below will be consulted annually for their views on the success of the mitigation, the likelihood of achieving the mitigation goal, the projected timeline for success, and any recommendations for improving the likelihood of success.

Appropriate Federal and state/commonwealth agencies:

1. US Fish and Wildlife Service Vero Beach Jacksonville, Florida Field Office.
2. NOAA Fisheries, Southeast Regional Office, St. Petersburg, Florida
3. Florida Department of Environmental Protection, Tampa Field Office

8.00 Use of Mitigation Bank

Research through internet and personal contact of local governments and other entities have determined no seagrass mitigation banks or in-lieu fee areas exist within the immediate region or same watershed as the project site. A mitigation bank located near Cockroach Bay does not contain sub-aquatic vegetation community, only freshwater and estuarine marine wetland, and minor mangrove habitat. The closest mitigation option offering a seagrass plant community is located the Keys near Lignum Vitae State Park, some 150 miles from the site.

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Seagrass Recovery, Inc, website 2011, <http://www.seagrassrecovery.com/index.htm>
St Petersburg, FL

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**PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)**

Site/Project Name GIWW - Longboat Pass Dredging Maintenance		Application Number Dep File No. 0305363-001 JC		Assessment Area Name or Number GIWW Cuts M-5 and M-14	
FLUCCs code 541 - Bays and Estuaries directly opening to the Gulf of Mexico		Further classification (optional) Outstanding Florida Water, Aquatic Preserve		Impact or Mitigation Site? Impact	Assessment Area Size 0.34
Basin/Watershed Name/Number Tampa Bay Watershed	Affected Waterbody (Class) Class 2		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance) Within Outstanding Florida Waters, Sarasota Bay Estuary Preserve Aquatic Preserve		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands GIWW Channel Cut M-5 and M-14 are within an existing Federal channel and as such, the assessment area is in a sub-aquatic ecological community directly connected to waters within Sarasota Bay, Tampa Bay, and the Gulf of Mexico					
Assessment area description GIWW Cut M-5 and M-14 are located within the northern portion of Sarasota Bay. The channel is heavily utilized by small to large vessel traffic for recreation and limited commercial boating. The channel has been dredged in past events, but has experienced build up of shoal from sediment, which in turn, has colonized with seagrass, specifically <i>Thalassia testudinum</i> , <i>Syringodium filiforme</i> , and <i>Halodule wrightii</i> .					
Significant nearby features Manatee County Park, boat launch, Jewfish Key, Anna Maria Island			Uniqueness (considering the relative rarity in relation to the regional landscape.) Not unique within the surrounding regional landscape		
Functions Small seagrass colonies scattered within the assessment area provide limited food resource for Florida manatee, cover for fish and invertebrate species, shelter and substrate for benthic species.			Mitigation for previous permit/other historic use NONE		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Green and loggerhead sea turtle and manatee foraging, fish forage and cover, invertebrate and benthic organisms cover and burrowing within the substrate, fly-over foraging by osprey, bald eagle, shorebirds, and wading birds			Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) Foraging by green and loggerhead turtle, Florida manatee		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): Fish, blue crab, shrimp, osprey, wading and shore birds. No sea turtle usage has been directly observed, although FWS and FWC data exists that show nesting on the shoreline adjacent to the assessment area.					
Additional relevant factors: The maintenance of the Federal channel of GIWW cuts M-5 and M-14 are within the authority of the US Army Corps of Engineers. Although maintenance activities have occurred over the past 60 years, no documented recent dredging has occurred within the past 10 years, which in turn, has allowed shoal material to build-up and become reestablished by seagrass. Extensive seagrass beds are present outside of the federal channel, which will not be affected by the proposed dredging action.					
Assessment conducted by: Kat McConnell			Assessment date(s): 29-Jun-11		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name GIWW - Longboat Pass Maintenance Dredging	Application Number DEP File No. 0305363-001 JC	Assessment Area Name or Number GIWW Cuts M-5 and M-14
Impact or Mitigation Mitigation	Assessment conducted by: Kat McConnell	Assessment date: 10-Jun-11

Scoring Guidance The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed

Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current 3 with 8	Current conditions: Location of Assessment Area limits opportunity to perform beneficial functions to 50% of the optimal Ecological value. Habitat availability outside Assessment Area is moderate for most but not all species of wildlife identified in Part 1. Assessment Area is located within the sub-aquatic zone of a shallow water environment that receives routine vessel groundings. These result in prop scars and vessel blow-outs that have a high impact on wildlife utilization by fragmentation and substrate disturbance. With Mitigation: Restoration of seagrass will improve the overall quality of the assessment area by providing an unfragmented and stable landscape. Fish, birds, sea turtles, benthic organisms, and mantee will increase usage of the restored injury sites from increased availability for food and shelter resources.
.500(6)(b)Water Environment (n/a for uplands) w/o pres or current 7 with 8	Current Conditions: Hydrology and moderate water quality support the function of this system and provides benefits to benthic organisms, fish and wildlife at the expected capacity for Assessment Area. Hydrology environment is moderate for the assessment area; disturbance from vessel groundings causes sediment turbidity in the water column and redistribution of fine-grained sediment on surrounding vegetation. Loss of vegetation within the injury sites diminishes functions of the system for improving water quality. Presence of use by wildlife as described in Part 1 is disrupted by disturbance to the system. Benthic community has limited usage due to injury to the substrate for this type of system. Although water depth is optimal for the assessment area, wave energy and current can restrict the prolonged growth of seagrass within the site. Light penetration needed for species growth is moderate due to fluctating turbidity. With Mitigation: The proposed restoration activity will stabilize the substrate through elevation correction and seagrass colonies reestablishment. The reduction in vessel groundings by posting navigation hazard signage in the protection zone will decrease grounding incidents that cause turbidity and sediment settling on vegetation.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current 0 with 8	Current conditions: Level of function to benefit fish and wildlife provided by Vegetation Community and Physical Structure is non-existent within the injury sites as all of plant cover has been removed through collision with vessels. Limited habitat for benthic organisms is available. No evidence of recruitment by natural means has occurred within the prop scars or vessel blow-out holes. Topographic features are unstable due to deep gouging to the substrate which degrades the benthic habitat. Silty sediment covers the vegetation surrounding the injury sites which causes additional stress to the assessment area. Undesireable algal growth is present from sediment instability that could impede submerged aquatic plant growth. With Mitigation: The restoration activity will reestablish seagrass colonies within the injury sites through corrected substrate elevation. Benthic habitat will be improved by stabilized substrate from seagrass colony establishment. Post construction monitoring will ensure a continued trend of success for vegetation growth within the restored injury sites and surrounding protection zone.

Score = sum of above scores/30 (if uplands, divide by 20) current or w/o pres 0.33 with 0.8
--

If preservation as mitigation, Preservation adjustment factor = Adjusted mitigation delta =

For impact assessment areas FL = delta x acres =

Delta = [with-current] 0.47

If mitigation Time lag (t-factor) = 1.1 (4-yr) Risk factor = 1.75 (within like habitat)

For mitigation assessment areas RFG= delta/(t factor x risk) = 0.244

**PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)**

Site/Project Name GIWW - Longboat Pass Dredging Maintenance		Application Number Dep File No. 0305363-001 JC		Assessment Area Name or Number GIWW Cuts M-5 and M-14	
FLUCCs code 541 - Bays and Estuaries directly opening to the Gulf of Mexico		Further classification (optional) Outstanding Florida Water, Aquatic Preserve		Impact or Mitigation Site? Mitigation	Assessment Area Size 0.65 ac
Basin/Watershed Name/Number Tampa Bay Watershed	Affected Waterbody (Class) Class 2		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance) Within Outstanding Florida Waters, Cockroach Bay Aquatic Preserve		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands Big Pass is a non-dredged marine waterway that extends between Big Pass Key and Camp Key offshore of Ruskin, FL. Big Pass connects Cockroach Bay to Tampa Bay and also includes numerous smaller islands of mangrove habitat. Also, extensive mangrove habitat is present along the shoreline of the mainland.					
Assessment area description Big Pass is located on the southeast side of Tampa Bay and provides limited access into Cockroach Bay. The non-maintained waterway is utilized by small to medium boat traffic for recreation. A public boat ramp is located some 0.5 mile south of Camp Key. No dredge channel is present but access by shallow draft vessels occur regularly. The substrate is heavily colonized with seagrass, specifically <i>Thalassia testudinum</i> , <i>Syringodium filiforme</i> , and <i>Halodule wrightii</i> , although numerous injury sites are present from collision by recreational boats .					
Significant nearby features Camp Key boat launch, Little Cockroach Bay			Uniqueness (considering the relative rarity in relation to the regional landscape.) Not unique within the surrounding regional landscape		
Functions Seagrass colonies scattered within the assessment area provide food resource for Florida manatee, cover for fish and invertebrate species, shelter and substrate for benthic species.			Mitigation for previous permit/other historic use NONE		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Green and loggerhead turtle and manatee foraging, fish forage and cover, invertebrate and benthic organisms cover and burrowing within the substrate, fly-over foraging by osprey, bald eagle, shorebirds, and wading birds			Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) Foraging by green and loggerhead turtle, Florida manatee		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): Fish, blue crab, shrimp, osprey, wading and shore birds. No sea turtle usage has been directly observed, although FWS and FWC data exists that show nesting on the shoreline adjacent to the assessment area.					
Additional relevant factors: Mitigation efforts are focused on the prop scar and blow-out holes from vessel groundings that collectively comprise "injury sites". Disturbances within the injury sites include total loss of seagrass shoots, severed root and rhizome systems, and deep gouging of the substrate which prohibits the sites from recovering without corrective measures. The restoration will include include correcting the substrate elevation to that of pre-disturbance level, seeding, and fertilizing through the use of bird-roosting stakes. Also, protective measures will include signage for boating navigation hazard to prevent any subsequent vessel groundings.					
Assessment conducted by: Kat McConnell			Assessment date(s): 29-Jun-11		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name GIWW - Longboat Pass Maintenance Dredging	Application Number DEP File No. 0305363-001 JC	Assessment Area Name or Number GIWW Cuts M-5 and M-14
Impact or Mitigation Impact	Assessment conducted by: Kat McConnell	Assessment date: 10-Jun-11

Scoring Guidance
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed

Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	Current conditions: Location of Assessment Area limits the opportunity to perform beneficial functions to 60% of the optimal ecological value. Habitat availability outside the assessment area is optimal for most but not all species within wildlife identified in Part 1. The assessment area is located within the sub-aquatic environment of a Federal channel having heavy vessel traffic from motorized and non-motorized small to large pleasure craft and commercial fishing boats. Current usage of the assessment area has moderate impact to wildlife utilization. With Impact: Loss of a minor amount of seagrass from dredging will have impact on the location and landscape for the assessment area. Fish, birds, sea turtles and manatee will continue to migrate through the area although the loss of foraging and cover habitat will occur. Loss of foraging habitat to manatee in heavy traffic area may have minimal benefit by lowering possibility of collision with vessels.	
	w/o pres or current 6	with 0

.500(6)(b)Water Environment (n/a for uplands)	Current Conditions: Hydrology and water quality mostly support the function of this system and provides benefits to fish and wildlife at high capacity for the assessment area. Hydrology environment is optimal for the assessment area, sub-aquatic plant community of seagrass. Vegetation is not hydrologically stressed. Presence of use by wildlife as described in Part 1 is as expected for this type of system. Benthic community is appropriate for this type of system. Sub-aquatic plant community composition is characterized by species not tolerant of or associated with water quality degradation or alterations in frequency, depth, and duration in inundation or saturation. Although water depth is optimal for the assessment area, wave energy and current can restrict the prolonged growth of seagrass within the Federal channel. Light penetration needed for species growth is moderate to high, although the area falls within a DEP-designated water quality impairment zone due to fluctuating turbidity. With Impact: The proposed maintenance activity will cause temporary impacts to water quality.	
	w/o pres or current 8	with 7

.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	Current conditions: Level of function to benefit fish and wildlife provided by Vegetation Community and Physical Structure is limited to 70% of optimal. All of the plant cover is by desirable plant species; no invasive species are present. Evidence of normal but limited recruitment by natural means has scattered age and size distribution. Topographic features are scattered in the channel and dependent upon encroachment by the build-up of shoal material consisting of sand and silty-sand sediment which degrades the benthic habitat. Although silty sediment has occurred in the assessment area, no evidence of algal growth was observed that could impede submerged aquatic plant growth. With Impact: The dredging activity will remove the seagrass beds within the channel in their entirety, and up to 5% of adjacent plant community along the buffer to the channel from side-slope slumping.	
	w/o pres or current 7	with 0

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres 0.7	with 0.37

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres = 0.159

Delta = [with-current]
-0.467

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas

**Mitigation Determination Formulas
(See Section 62-345.600(3), F.A.C.)**

For each impact assessment area:

(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable)/((t-factor)(risk))

If the acreage of mitigation proposed is known:

(FG) Functional Gain = Relative Functional Gain X Mitigation acres

(a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scored

Bank Assessment				
Areas	RFG	X	Acres	= Credits
example				
a.a.1	<input type="text"/>		<input type="text"/>	<input type="text"/>
a.a.2	<input type="text"/>		<input type="text"/>	<input type="text"/>
total				<input type="text"/>

(b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assessed in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.

Impact Assessment			
Area	FL	=	Credits needed
example			
a.a.1	<input type="text"/>		<input type="text"/>
a.a.2	<input type="text"/>		<input type="text"/>
total			<input type="text"/>

(c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regional offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG).

	FL	/	RFG	=	Acres of Mitigation
example					
a.a.1	<input type="text" value="0.159"/>		<input type="text" value="0.244"/>		<input type="text" value="0.65"/>

If there are multiple impact assessment areas and/or multiple mitigation assessment areas to offset those impacts, or if the proposed mitigation acreage is a given, then the summation of the appropriate functional gain (FG) must be equal to or greater than the summation of respective functional losses (FL)

	example	FL	<	FG
impact	a.a.1	<input type="text"/>		
	a.a.2	<input type="text"/>		
	a.a.3	<input type="text"/>		
mitigation	a.a.4			<input type="text"/>
	a.a.5			<input type="text"/>
summation		<input type="text"/>		<input type="text"/>

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GIWW - LONGBOAT PASS ENVIRONMENTAL ASSESSMENT

APPENDIX I

SCOPING LETTER AND RESPONSES

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DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

JUL 21 2011

Planning Division
Environmental Branch

To Whom It May Concern:

Pursuant to the National Environmental Policy Act and U.S. Army Corps of Engineers Regulation (33 CFR 230.11), this letter constitutes the Notice of Availability of the draft Environmental Assessment (EA) for Gulf Intracoastal Waterway and Longboat Pass Maintenance Dredging with Nearshore Placement, Manatee and Hillsborough County, Florida.

The draft EA is available on the U.S. Army Corps of Engineers , Jacksonville District website for your review and comment at:

http://www.saj.usace.army.mil/Divisions/Planning/Branches/Environmental/DocsNotices_OnLine_ManateeCo.htm.

For comments to be considered, they must be received within 30 days from the date of this letter unless additional review time is authorized by federal law. Letters should be addressed to the letterhead address, to the attention of the Planning Division, Environmental Branch, Coastal Section. If you have any questions or comments, please contact Ms. Kathleen McConnell by telephone at 904-232-3607, or by email at kathleen.k.mcconnell@usace.army.mil.

Sincerely,

Eric P. Summa
Chief, Environmental Branch

Enclosure



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

JUL 21 2011

Operations Division
Public Notice No. PN-OD-GIWW-290

PUBLIC NOTICE

TO WHOM IT MAY CONCERN: The Jacksonville District is proposing to conduct maintenance dredging of the Gulf Intracoastal Waterway (GIWW) and Longboat Pass, including Longboat Cut-2 and Cut-3, GIWW Cut M-5, M-12, M-14 and Sunshine Skyway Cut SC-2 and SC-3. The local sponsor is the West Coast Inland Navigation District (WCIND). The proposed placement location for the dredged materials is in the near shore area of Egmont Key approximately 1500-5000 linear feet from the shore, in a 177 acre site, between 8 and 13 feet of water. Since the initial construction, sand and sediments have accumulated in the harbor and channel. This reduces the navigable capacity of the project. To meet the public need as authorized by Congress, the Federal standard must be maintained.

Comments regarding the project should be submitted either in writing or e-mail to the District Engineer at the above address within 15 days from the date of this notice. Any person who has an interest, which may be affected by the construction of this project, may request a public hearing. The request must be submitted in writing to the District Engineer within 15 days of the date of this notice and must clearly set forth the interest, which may be affected and the manner in which the interest may be affected by this activity.

If you have any questions concerning this project, you may contact Mr. Allan Morris of this office by telephone at 904-232-2258 or by E-mail at Allan.D.Morris@usace.army.mil.

WATERWAY & LOCATION: Federal Channel, Hillsborough, Pinellas and Manatee Counties, Florida.

Work & Purpose: Since the initial construction, sand and sediments have accumulated in the harbor and channel. This reduces the navigable capacity of the project. To meet the public need as authorized by Congress, the Federal standard must be maintained. The proposed work involves the removal of approximately 3,000 CY of material from Longboat Cut-2 to a design depth of 10 feet project depth plus an allowable 2 feet overdepth; removal of approximately 27,000 CY of material from Longboat Cut-3 to a design depth of 10 feet project depth plus an allowable 2 feet overdepth; removal of approximately 45,000 CY of material from GIWW Cut M-5 to a design depth of 9 feet project depth plus an allowable 2 feet overdepth; removal of approximately 7,000 CY of material from GIWW Cut M-12 to a design depth of 9 feet project depth plus an allowable 2 feet

overdepth; removal of approximately 12,500 CY of material from GIWW Cut M-14 to a design depth of 9 feet project depth plus an allowable 2 feet overdepth; removal of approximately 12,000 CY of material from Sunshine Skyway Cut SC-2 to a design depth of 9 feet project depth plus an allowable 2 feet overdepth; removal of approximately 7,000 CY of material from Sunshine Skyway Cut SC-3 to a design depth of 9 feet project depth plus an allowable 2 feet overdepth. The quantity of material represents dredging the channel to the appropriate project depth plus an allowable 2 feet of overdepth. The material will be disposed in the nearshore area of Egmont Key approximately 1500-5000 linear feet from the shore, in a 177 acre site, between 8 and 13 feet of water.

PROJECT AUTHORIZATION: Rivers and Harbors Act of December 31, 1970, House Document No. 401, 91st Congress, Second Session.

APPLICABLE LAWS: The following laws are, or may be, applicable to the review of the proposed disposal sites and to the activities affiliated with this Federal project:

1. Section 404 of the Clean Water Act of 1977 (PL 95-217) (33 U.S.C. 1344).
2. Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972 (PL 92-532) (33 U.S.C. 1413, 86 Stat. 1052).
3. Section 302 of the Marine Protection, Research, and Sanctuaries Act of 1972 (PL 92-532, 86 Stat. 1052).
4. The National Environmental Policy Act of 1969 (PL 91-190) (42 U.S.C. 4321-4347).
5. Sections 307(c)(1) and (2) of the Coastal Zone Management Act of 1972 (16 U.S.C. 1456(c)(1) and (2), 86 Stat. 1280).
6. The Fish and Wildlife Act of 1956 (16 U.S.C. 472a et seq).
7. The Migratory Marine Game-Fish Act of 1959 (16 U.S.C. 760c-760g).
8. The Fish and Wildlife Coordination Act of 1958 (16 U.S.C. 661-666c).
9. The Endangered Species Act of 1973 (PL 93-205) (16 U.S.C. 668aa-668cc-6, 876 Stat. 884).

FLORIDA OFFICE OF ENTOMOLOGY
SOUTH WEST FLORIDA WATER MANAGEMENT DISTRICT
FLORIDA STATE CLEARINGHOUSE
FLORIDA MARINE PATROL
BUREAU OF STATE PLANNING
FLORIDA DIVISION OF RECREATION
HABITAT CONSERVATION SERVICE
FLORIDA STATE CONSERVATION SERVICE
FLORIDA STATE REPRESENTATIVES

ENVIRONMENTAL ORGANIZATIONS:

FLORIDA AUDUBON SOCIETY, MAITLAND, FL
FRIENDS OF THE EVERGLADS
FLORIDA WILDLIFE FEDERATION, WEST PALM BEACH, FL
SIERRA CLUB
FLORIDA DEFENDERS OF THE ENVIRONMENT
NATIONAL ESTUARY PROGRAM, ST. PETERSBURG, FL
G.E.C., INC.

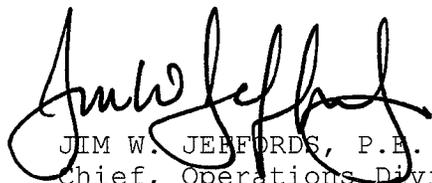
LOCAL GOVERNMENTS AND ORGANIZATIONS:

HILLSBOROUGH COUNTY ADMINISTRATOR
BOARD OF COUNTY COMMISSIONERS, HILLSBOROUGH COUNTY
CITY OF TAMPA
GULF COAST INLAND NAVIGATION DISTRICT
SOUTH FLORIDA REGIONAL PLANNING COUNCIL
AREA ON BAY MANAGEMENT

MEDIA:

THE TAMPA TRIBUNE
THE ST. PETERSBURG TIMES

FOR THE COMMANDER:

A handwritten signature in black ink, appearing to read "Jim W. Jeffords". The signature is stylized and cursive, written over the typed name and title.

JIM W. JEFFORDS, P.E.
Chief, Operations Division

Encl



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Southwest Florida Water Management District

2379 Broad Street, Brooksville, Florida 34604-6899
(352) 796-7211 or 1-800-423-1476 (FL only)
TDD only: 1-800-231-6103 (FL only)
On the Internet at WaterMatters.org

Bartow Service Office
170 Century Boulevard
Bartow, Florida 33830-7700
(863) 534-1448 or
1-800-492-7862 (FL only)

Sarasota Service Office
6750 Fruitville Road
Sarasota, Florida 34240-9711
(941) 377-3722 or
1-800-320-3503 (FL only)

Tampa Service Office
7601 Highway 301 North
Tampa, Florida 33637-6759
(813) 985-7481 or
1-800-836-0797 (FL only)

H. Paul Senft, Jr.
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Jennifer E. Closshey
Hillsborough

William S. Bilenky
Interim Executive Director
and General Counsel

August 19, 2011

Attn: Ms. Kathleen McConnell
Planning Division, Environmental
Branch, Coastal Section
Department of the Army
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Re: **Environmental Assessment for Maintenance Dredging of the Gulf Intracoastal Waterway and Longboat Pass**

Dear Ms. McConnell:

Thanks for the opportunity to review the referenced application. We offer the following comments:

Page 10. The application provides no information on the type of dredging equipment to be used. This information would be helpful in determining overall impacts, and therefore, should be reflected in the project specifications.

Page 15. Shorebird roost staking was identified as a strategy for seagrass recruitment. This strategy, which is recognized in literature, relies on bird guano to provide a nutrient source to the marine environment for recruitment. If an area is not low in nutrients the activity can load excess nutrients into the system and become detrimental to the seagrass. Research into the previous use of roost stakes in Tampa Bay waters and the necessity of them is warranted.

Pages 25 and 38. The expected seagrass impacts are somewhat unclear. In Page 25 CIWW cuts M-5 and M-14 are stated as having 0.33 acres of seagrass within the proposed dredge area, while Page 38 reports the impacts to seagrass total as 0.48 acres "present in the navigational channel" of these cuts. The difference between the two amounts should be clarified. Further, statements regarding the amount of seagrass present within the navigational channel, the amount within the dredge project area (seagrass in the channel + seagrass along the channel but in the project area), and the total seagrass area that will be impacted should also be clarified.

Appendix H. Monitoring of the mitigation sites after the sediment tubes disintegrate will be vital to observe if the sediments have been stabilized by seagrass growth into the areas. Unstable sediments could adversely affect seagrasses.

Ms. Kathleen McConnell
August 19, 2011
Page 2

Thanks again for the opportunity to participate in this review. Should you have any questions or if I can be of further assistance, please contact me in the District's Planning Department.

Sincerely,

A handwritten signature in black ink that reads "Trisha Neasman". The signature is written in a cursive, flowing style.

Trisha Neasman, AICP
Government Planning Coordinator

cc: Kris Kaufman, SWFWMD
Terri Behling, SWFWMD
Cori Cuttler, SWFWMD

From: [Milligan, Lauren](#)
To: [Summa, Eric P.SAJ](#); [McConnell, Kathleen K.SAJ](#)
Cc: [Dow, Roxane](#); [Seeling, Martin](#); [Carothers, Michael](#); [Clayton, Danny](#); [Forte, Michele](#)
Subject: USACE GIWW Maintenance Dredging with Nearshore Placement - Draft EAs
Date: Tuesday, July 26, 2011 4:06:30 PM
Attachments: [GIWW RAI #1 \(4-20-11\).pdf](#)
[i_Signed Cover Letter.pdf](#)

Dear Eric and Kathleen:

RE: Department of the Army, Jacksonville District Corps of Engineers – Draft Environmental Assessments – Maintenance Dredging with Nearshore Material Placement, Gulf Intracoastal Waterway (GIWW) Cuts M-5, M-12 and M-14, Longboat Pass Cuts LP-2 and LP-3, and Sunshine Skyway Cuts SC-2 and SC-3 – Hillsborough, Manatee and Pinellas Counties, Florida.

http://www.saj.usace.army.mil/Divisions/Planning/Branches/Environmental/DOCS/OnLine/Hillsborough/GIWW/GIWW_LBP_EA.pdf

http://www.saj.usace.army.mil/Divisions/Planning/Branches/Environmental/DOCS/OnLine/Manatee/Skyway/Sunshine_%20Skyway_EA.pdf

The State Clearinghouse has received copies of the referenced Draft EAs for the proposed GIWW–Longboat Pass to Sunshine Skyway maintenance dredging project. Given the DEP Bureau of Beaches and Coastal Systems' on-going state intergovernmental review of the Joint Coastal Permit application (DEP File No. 0305363-001-JC) for the same project, I would like to request that the State Clearinghouse be allowed to abstain from duplicating the CZMA federal consistency review process for the Draft EAs.

As indicated in Section 1.8 of the Sunshine Skyway Cuts SC-2 and SC-3 Draft EA, "...the Corps will obtain a permit from the FDEP that includes water quality certification and the final finding of coastal zone consistency. This permit will include a finding of 'reasonable assurance' that the project is in compliance with all water quality standards, as well as all the other enforceable regulations included in the Florida Coastal Zone Management Program."

If the USACE is agreeable, could the requests for federal consistency concurrence included in the Draft EAs' Appendix B be withdrawn at this time to allow for completion of the JCP application review process and the state's subsequent final CZMA consistency decision?

If you have any questions or would like to discuss this further, please don't hesitate to contact me at (850) 245-2170 or Lauren.Milligan@dep.state.fl.us. Thank you!

Best regards,

Lauren

Lauren P. Milligan, Environmental Manager
Florida State Clearinghouse
Florida Department of Environmental Protection
3900 Commonwealth Blvd, M.S. 47
Tallahassee, FL 32399-3000
ph. (850) 245-2170
fax (850) 245-2190

The Department of Environmental Protection values your feedback as a customer. DEP Secretary Herschel T. Vinyard Jr. is committed to continuously assessing and improving the level and quality of services provided to you. Please take a few minutes to comment on the quality of service you received. Simply click on this link to the DEP Customer Survey <<http://survey.dep.state.fl.us/?refemail=Lauren.Milligan@dep.state.fl.us>> . Thank you in advance for completing the survey.



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

Planning Division
Environmental Branch

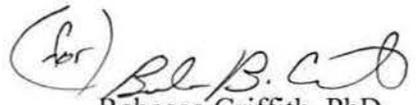
TO ADDRESSES ON THE ATTACHED LIST

The Jacksonville District, U.S. Army Corps of Engineers is gathering information to define issues and concerns to be addressed in an Environmental Assessment for an upcoming operations and maintenance dredging project. The project area covers specific segments (M-5, M-12, and M-14) of the Gulf Intracoastal Waterway located between the Caloosahatchee and Anclote Rivers, and Longboat Key Pass Cuts 1 and 2, all located within Manatee County, Florida (see enclosed maps). Authority and funds for the project are provided by Section 107 of the Rivers and Harbors Act of 1960, as amended.

Alternatives being considered include the no action alternative, removal of shoal material by dredge with placement occurring in the nearshore environment of Egmont Key, located within Hillsborough County; as well as placement of beach quality material on Longboat Key Beach in Manatee County.

We welcome your views, comments and information about environmental and cultural resources, project objectives and important features within the described project area, as well as any suggested improvements. Letters of comment or inquiry should be addressed to the letterhead address to the attention of the Planning Division, Environmental Coordination Section and received by this office within forty-five (45) days of the date of this letter.

Sincerely,


Rebecca Griffith, PhD
Chief, Planning Division

Enclosure

Spinning\CESAJ-PD-EC
Summa\CESAJ-PD-E
Cintron\CESAJ-PD-P

L:\GROUP\PDE\EXAMPLES\SCOPING.LTR

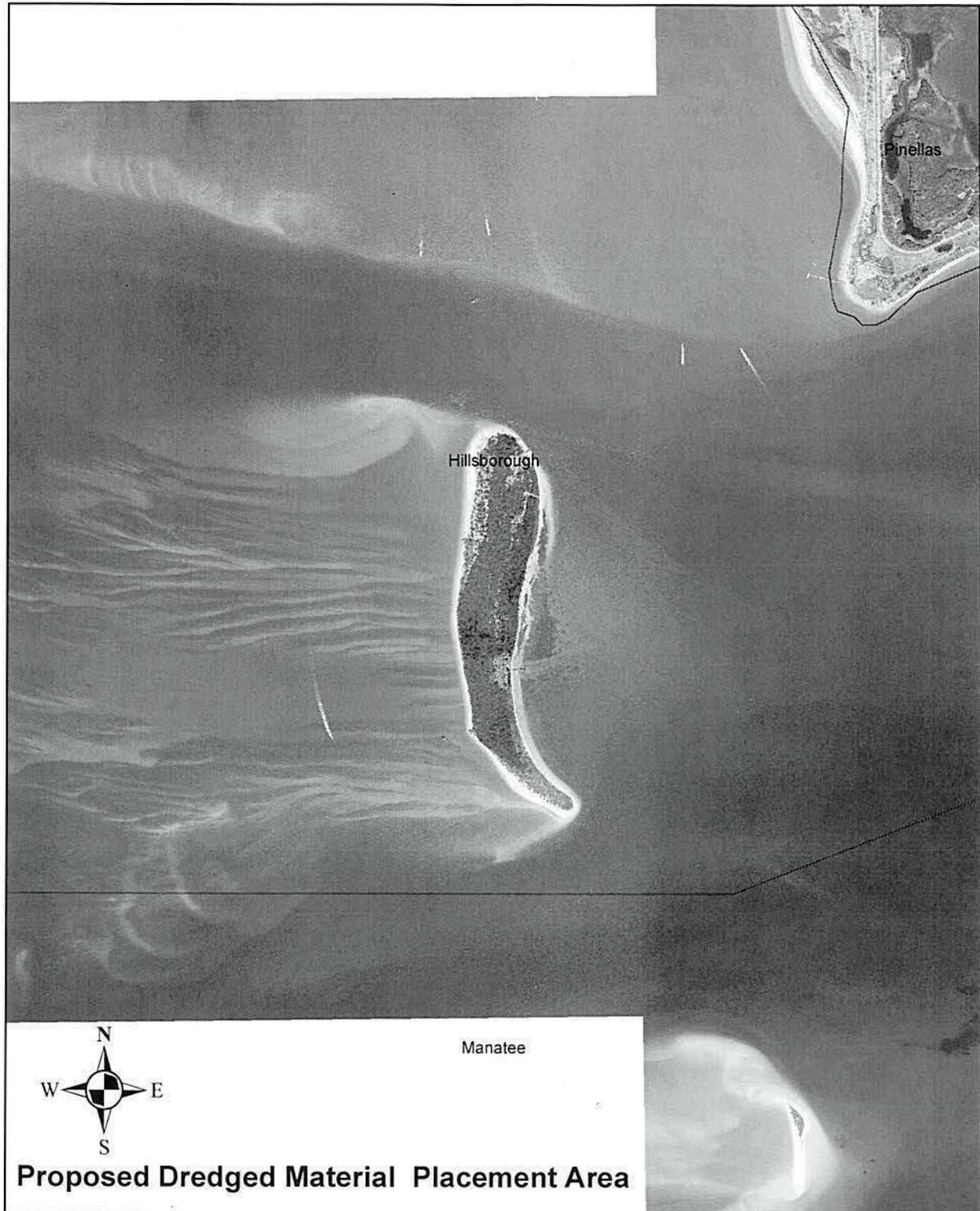


Figure 1. Project Area: GIWW of Anna Maria Island, Longboat Key at Longboat Pass.

Image U.S. Geological Survey
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
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Google

Nearshore of Egmont Key





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office

263 13th Avenue South
St. Petersburg, Florida 33701-5505
(727) 824-5317; FAX 824-5300
<http://sero.nmfs.noaa.gov>

January 24, 2011 F/SER46:MS/mt

Colonel Alfred A. Pantano, Jr., District Commander
Planning Division, Environmental Branch
Department of the Army, Corps of Engineers
P. O. Box 4970
Jacksonville, Florida 32232-0019

Dear Colonel Pantano:

NOAA's National Marine Fisheries Service (NMFS), Southeast Region, Habitat Conservation Division has reviewed your staff's December 27, 2010, letter concerning the development of an Environmental Assessment (EA) for an upcoming operations and maintenance dredging project. The project area includes portions of the Gulf Intracoastal Waterway located between the Caloosahatchee and Anclote rivers in Lee and Pasco Counties Florida, respectively, and Longboat Key Pass Cuts "1" and "2" in Sarasota County, Florida. Alternatives being considered include the dredging of shoal material from the project areas with material placement in the near shore environment adjacent to Egmont Key in Hillsborough County, and beach quality material on Longboat Key in Manatee County, Florida.

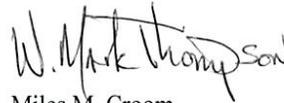
To fully address essential fish habitat (EFH) and associated fisheries in the project area, we recommend the EA include sections titled "Essential Fish Habitat" and "Marine Fishery Resources" that describe the potential project impacts on each category of EFH (e.g., submerged aquatic vegetation, mangrove wetlands, marine live bottoms, and estuarine water column) and marine and estuarine fishery species within the project area. These sections should analyze the potential impacts of the proposed project on EFH and dependent federally managed species and life stages and should fully evaluate alternative measures to avoid, minimize, and offset adverse impacts. Section 600.810(a) of the EFH regulations defines an adverse effect to EFH as any impact that reduces the quality and/or quantity of EFH, including the loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components. The EA should analyze impacts to benthic and prey species in the discussion of impacts to EFH. This descriptive and analytical information, coupled with a statement of your agency's conclusions regarding the effects of the action on EFH and marine fishery species, would provide the basic details necessary for an EFH assessment pursuant to the requirements of 50 CFR 600.920(e). The Gulf of Mexico Fishery Management Council should also be provided an opportunity for comment on EFH issues under provisions of the Magnuson-Stevens Fishery Conservation and Management Act.



Further, the project area is within the known distribution limits of a federally listed threatened species under purview of NMFS. In accordance with the Endangered Species Act of 1973, as amended, it is your responsibility to review this proposal and identify actions that may affect endangered or threatened species. Determinations involving listed species should be reported to our Protected Resources Division at the letterhead address. If it is determined that the activities may adversely affect any species listed as endangered or threatened under Protected Resources Division purview, formal consultation must be initiated.

If you have questions regarding preparation of an EFH assessment for this project, please contact Mr. Mark Sramek at the letterhead address above, by telephone at (727) 824-5311, or e-mail at Mark.Sramek@noaa.gov.

Sincerely,

Handwritten signature of W. Mark Thompson in black ink.

for

Miles M. Croom
Assistant Regional Administrator
Habitat Conservation Division

cc:
F/SER4
F/SER46 – Sramek
F/SER3



MANATEE COUNTY
FLORIDA

January 7, 2011

Rebecca Griffith, PhD
Chief, Planning Division
Environmental Coordination Section
Department of the Army
Jacksonville District Corps of Engineers
P. O. Box 4970
Jacksonville, Florida 32232-0019

Dear Ms. Griffith:

We are in receipt of your letter date stamped December 27, 2010, to gather information to define issues and concerns to be addressed in an Environmental Assessment for an upcoming operations and maintenance dredging project, specifically within the Gulf Intracoastal Waterway (GIWW) at Longboat Key Pass Cuts 1 and 2.

Manatee County has been briefed by the Army Corps Jacksonville District Project Manager, Mr. Milan Mora, concerning the details for GIWW for the following sections wholly contained in Manatee County, including M-12 and M-14 at Anna Maria Sound, and M-5, LB-2 and LB-3 in the vicinity of Longboat Pass, and the Longboat Key Pass Cuts 1 and 2, identifying the preferred alternative for shoal material placement in the nearshore environment of Egmont Key as well as placement of beach quality material on Longboat Key, if conditions allow.

Manatee County fully supports the action alternatives being considered to improve navigation in the Gulf Intracoastal Waterway and has no further comment at this time regarding the project's effect upon environmental and cultural resources, project objectives or important features within the described project area.

Sincerely,

Charlie Hunsicker
Director

cc: Manatee County Board of County Commissioners
Ed Hunzeker, County Administrator
Chuck Listowski, West Coast Inland Navigation District
Rick Spadoni, Coastal Planning & Engineering
Bruce St. Denis, Town of Longboat Key

Natural Resources Department
Mailing Address: P.O. Box 1000, Bradenton, FL 34206-1000 * Street Address: 415 10th Street West, Bradenton, FL 34205
PHONE: 941.745.3723 * FAX: 941.741.3227
www.myanatee.org

POB 5430
Salt Springs, FL 32134
January 3, 2011

Corps of Engineers, Jacksonville District
Planning Division
Environmental Coordination Section
POB 4970
Jacksonville, FL 32232-0019

RE: EA Gulf Intracoastal Waterway, Caloosahatchee River to the Anclote River, Segments M-5, M-12 and M-14

Gentlemen:

With reference to your notice of December 27, 2010, I would comment that the area contains substantial acreage of recovering seagrass meadows that could potentially be impacted by the proposed dredging activities and secondarily impacted by increased boating activity within and adjacent to the GIWW.

There have been past general permits issued by the Florida Department of Environmental Regulation to allow for maintenance dredging that have included criteria attempting to either protect existing seagrass or mitigate for any impacts. These past efforts need to be carefully reviewed for possible use in the proposed dredging project. While much was promised, there have been to date no published information I am aware of documenting any success or failure of these past protection and mitigation efforts. This information needs to be thoroughly reviewed and discussed in any EA or EIS prepared for this project.

In particular, the placement of gated channel markers (pairs on either side of a channel) have been recommended for many years in order to facilitate navigation within the GIWW and prevent straying into adjacent shallow waters. This again should be carefully considered as part of this project, and all future such projects.

Please place my name on your mailing list to receive any hard copies of all documents, reports, draft EA's, final EA's, draft and final EIS's should they be prepared, and copies of any submitted comments from federal, state and local review agencies including but not limited to FDEP, NOAA, FFWCC, etc.

Sincerely yours,



Roy R. Lewis III
Professional Wetland Scientist

GIWW - LONGBOAT PASS ENVIRONMENTAL ASSESSMENT

APPENDIXJ

MAILING LIST

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