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Response to Request for Additional Information

SER-2018-19433

Summer's End Marina at Coral Bay, St. John, U.S.V.I.

Sea Diversified P.N. 19-2268

April 26, 2019

**DRAFT FOR REVIEW AND
COMMENT**

The following is in response to the Request for Information (RAI) received from the U.S. Army Corps of Engineers (USACE) dated September 26, 2018 and to address comments received by the National Marine Fisheries Service (NMFS) dated October 25, 2018.

Evaluation of Potential Impacts to Essential Fish Habitat

Task One: Geotechnical

The proposed project includes the installation of approximately 960 steel piles with an estimated embedment depth of twenty-five (25) feet. Based on correspondence received from Technomarine Construction, Inc. (TCI) dated June 18, 2018, it was estimated that it would take an average of 300 strikes to install each pile using standard mechanical pile driving methodologies assuming that the sediments within the footprint of the project consists of a mixture of fine, silty sand and clay throughout the twenty-five (25) embedment depth. Assuming these sediment characteristics are correct, TCI also estimated that an average of six (6) piles could be driven per day, which would result in a total of 166 days of pile driving operations. In order to validate the estimated number of days for pile driving, as well as verify means and methods of pile installation, the USACE requested confirmation of the type of sediments within the footprint of the marina. Specifically, the USACE requested an investigation to determine whether harder material is present within the 25-foot embedment depth that could ultimately impact methods of pile installation and/or increase the time frame for driving each pile, number of piles that can be driven per day and estimated total duration of pile driving operations. Of primary interest is to confirm required methods and total duration of pile driving to assess potential impacts of sedimentation and shading of seagrass during construction.

In response to the request of the USACE, Sea Diversified, Inc. (SDI), in coordination with the Summer's End Group, LLC, (Summer's End) proposes to conduct a geotechnical investigation of the project site using sub-bottom profiling methodologies (Phase 1). Using this remote sensing technology, high resolution images of the sub-bottom stratigraphy can be acquired, which will provide a general understanding of the sediment layer characteristics including the depth to rock or hardbottom within the sub-surface material profile. Based on the results of the remote sensing operations, SDI will provide a comprehensive report detailing if and where the rock layers are found. SDI in coordination with Summer's End and the project engineer will provide recommendations for pile driving methodologies along with an updated estimate on pile strikes, as applicable, including projected number of days for pile driving.

Phase 1 Geotechnical - Sub-Bottom Profile Data Acquisition

Sub-bottom profile data shall be collected using an Edgetech Sub-Bottom Profile system (3100P with SB-216 tow-fish), which operates at a low frequency range (2-16 kHz) to maximize penetration into the sub-surface sediments. The sub-bottom profile system will be a portable system that uses a full spectrum CHIRP technology that minimizes multipath and noise effects while achieving high definition image slices of the sub-bottom material characteristics. Positioning and heading shall be provided via integrated dual-antenna DGPS with heading accuracy of 0.5 degrees. Data will be captured in a georeferenced, digital environment



allowing the operator to interpret and classify sediment stratifications real-time during the course of the survey. Data will be collected along transects spaced at intervals of no greater than fifty (50) feet oriented perpendicular to the shoreline. Tie lines will be conducted as necessary to verify the primary profile data.

Upon completion of the fieldwork, data will be processed to identify and map sub-bottom stratifications as discernable from the seismic data. Isolated objects or features buried below the seafloor will be specifically noted as anomalies for subsequent investigations. Final deliverables shall include processed sub-bottom data reduced to a X, Y, delta-Z format along with sub-bottom isopach maps. Along with the map, SDI will prepare a report describing field data collection methodologies and results of the investigation. The map and report will be provided to the project engineer to assess pile driving means and methods and to update estimated time frames for pile installation based on the types of material encountered throughout the marina.

During the conduct of the geotechnical investigation, SDI will collect surface samples of the material at six (6) locations randomly spaced within the footprint of the proposed marina. This will include composite sampling of the surface sediments to a depth of approximately 12", noting surface characteristics of sediment. Samples will be properly bagged or containerized and delivered to a laboratory for characterization. The results will be used as part of the circulation study and specifically to assist in the evaluation of possible turbidity impacts caused by the disruption of sediments (prop wash) from large vessels.

Task Two: Circulation Study

The proposed project is located within Coral Harbor. Previous water current measurements conducted by the Applicant show that water movement in the bay induced by wind and tides is sluggish, and there is a question about how long disturbed sediments released into the water column could remain in suspension. The USACE raised concern that disruption of sediments from large vessel movement (prop wash) within and around the new marina could contribute to the high levels of turbidity in the bay. To address the concern, the USACE requests a water circulation study to assess the possibility of increased turbidity arising from suspended sediments caused by prop wash.

Circulation Model

In response to the request of the USACE, Humiston & Moore Engineers (H&M) will research and review water levels, bathymetry and other relevant information to develop the numerical model for the project area. As part of this task, SDI will collect supplemental bathymetric data as described below. The Coastal Modeling System (CMS) suite of numerical models developed by the USACE Coastal and Hydraulics Laboratory will be used to evaluate the prevailing current circulation during typical tidal exchanges.

Flushing Analysis

This modeling task will simulate the flushing of a conservative constituent from the waterway system, (a conservative constituent is one that doesn't go through chemical or biological transformation) using the RMA model. The model computes the concentration change over time at the site due to the amount of released constituent, the ambient concentration, local hydrodynamic flushing, mixing, and diffusion. The calculated concentration change over time will be analyzed at selected observation points. A comparison of the efficiency of the flushing will be provided by the elapsed time to reach 10% of the maximum concentration at a given location for both the existing and proposed waterway configuration (DEP criteria).



Water Quality and Field Measurement Review

This task will include analysis of field data to help address agencies turbidity and water quality comments. The proposed task will be based on bottom sediment sampling (SDI – Task One), turbidity measurements (PEI – Task Three) and ADCP deployment. H&M will provide analysis and expert support in addressing the agencies' comments.

Deliverables will include a technical report summarizing methodologies and results of the modeling efforts.

Bathymetric Data Acquisition

As required for the circulation study, bathymetric data shall be collected along transects as depicted on **Exhibit A** included, herewith. Additional bathymetric data shall be collected within the footprint of the proposed marina. This will include data collected along transects spaced at intervals of fifty (50) feet oriented perpendicular to the shoreline. Data collection shall extend one hundred (100) feet beyond the marina footprint or to the limits of the survey vessel. (Reference **Exhibit B**)

The survey shall be conducted using an automated hydrographic system comprised of a survey launch (supplied by the Client) equipped with Odom marine grade, single-beam sounder, Trimble Differential Global Positioning System (DGPS) and computer-based navigation / data collection system. The sounder shall be calibrated via bar checks at the beginning of each survey day. Soundings will be corrected for tidal fluctuations using an integrated Real-Time Kinematic GPS. A tide gauge will also be established and monitored in proximity to the project area as a redundant means of recording tides during the course of data collection. A motion sensor will be employed as necessary to reduce the effects of vessel heave, pitch and roll during the course of data collection.

Sounding / positioning data will be collected and recorded continuously throughout the survey on computer internal hard-drives. Daily backups of all raw digital data to external hard-drive will be performed as required. Upon completion of field survey activities, data will be edited and reduced to the project datum and formatted as required for bathymetric modeling and chart preparation. Final data, reduced to an X,Y,Z, ASCII format will be imported to a CADD environment and subsequently translated to Digital Terrain Model (DTM) for generating contour charts and profile plots.

Survey of Reefs at Entrance to Coral Harbor

In support of Pinnacle Ecological, Inc. (PEI)'s comprehensive assessment survey of ESA-listed corals and critical habitat (Phase 2 – ESA-listed Coral Survey and Critical Habitat Delineation), SDI will conduct a detailed survey of the reefs located off Harbor Point and Pen Point that are positioned along the east and west shorelines at the entrance to Coral Harbor. The reef areas will be mapped using a combination of multi-beam sounding and side scan sonar technologies. The multi-beam survey shall provide very detailed bathymetry of the reef areas with a sounding density of better than 0.5 meters grid interval. The side scan sonar survey will provide high-resolution acoustic images to assist in identifying the horizontal limits of each reef area and to assist in the classification of reef characteristics. The survey operations are described as follows:

- Multi-Beam Bathymetric Survey
SDI shall conduct a multi-beam bathymetric survey to obtain full bottom coverage of both reef areas. The survey shall be conducted using an automated hydrographic system comprised of a shallow draft survey launch equipped with a Teledyne shallow water multi-beam swath system (400 kHz or greater resolution) with integrated Teledyne TSS DMS-05 Motion Sensor. A Trimble SPS-

461 RTK/DGPS shall be used for vessel positioning and heading. For navigation, data collection and processing SDI shall employ a computer equipped with the Xylem brand HYPACK/HYSWEEP software. Equipment calibration procedures shall follow manufacturer recommendations.

Soundings will be collected in both raw and adjusted (tide corrected) formats using RTK GPS derived water surface elevations. Data shall be collected in feet relative to the project datum. Redundant tide measurements will be recorded as a quality control check on the RTK GPS derived water surface elevations. A tide gauge shall be employed to record continuous tidal data during the course of bathymetric data collection. Tidal data shall be collected and recorded at intervals 10-minute intervals or less. Upon completion of the survey bathymetric contour maps shall be provided to PEI to assist in their assessment survey.

- Side Scan Sonar Survey

SDI shall conduct a side scan sonar survey as required to achieve full bottom coverage of both reef areas. Side scan sonar data will be collected using an Edgetech, Model 4125, fully digital, high-resolution (400 / 900 kHz) side scan sonar data acquisition system. The 4125 utilizes full spectrum CHIRP technology for superior resolution. Positioning shall be provided via integrated Trimble SPS-461 RTK/DGPS. Data shall be collected to within navigable limits of survey launch. The system range setting will be set to achieve full bottom coverage of the survey areas with no less than 100% overlap between adjacent lines. Data will be captured in a georeferenced, digital environment allowing the operator to interpret and classify objects real-time during the course of the survey.

Upon completion of the field survey, digital images will be translated to a fully georeferenced mosaic utilizing Chesapeake software, and subsequently exported as Geo-Tif images for interpretation and charting. The Geo-Tif images will be superimposed on maps produced from the bathymetric survey operations. Features of interest will be mapped and classified. Features of unknown or questionable classification will be noted accordingly for subsequent diver verification by PEI.

Task Three: Benthic Study

In RAI (SER-2018-19433), National Marine Fisheries Service (NMFS) expressed concerns that some of the project's proposed activities may pose direct and indirect impacts to ESA-listed coral species in the project's "action area". The "action area" as defined by the Environmental Assessment Report (April 2014) includes 97 acres in Coral Harbor. However, the United States Army Corp of Engineers (USACE) has expanded this "action area" to include 114 acres. In addition to the action area, the applicant proposes, if necessary, an additional 750 acres for mitigation activities (Compensatory Mitigation Plan, December 2017). Mitigation activities in the 750 acres will depend upon the results of the proposed circulation model and flushing analysis studies as well as the presence and extent of marine debris and damaged ESA-listed corals throughout the potential mitigation area. The applicant proposes to conduct a survey to identify ESA-listed coral species within the project's defined "action area" and the "mitigation area".

In response, Pinnacle Ecological, Inc. (PEI)'s scope of work will include:

- providing a comprehensive list of ESA-listed corals present in the proposed project's "action area",

- identify, delineate, and quantify critical habitat with suitable substrate to support successful larval settlement, recruitment, and reattachment of asexual fragments in the action area,
- determine feasibility of the proposed Compensatory Mitigation Plan (December 2017) and present viable mitigation options,
- determine the presence of marine debris for potential removal and damaged ESA-listed corals that could be reattached in the 750-acre “mitigation area” as presented in the Compensatory Mitigation Plan (December 2017), and
- update the Compensatory Mitigation Plan based on the results of the proposed scope of work.

Additionally, PEI will collect turbidity measurements within and adjacent to the proposed project “action area” to provide background data necessary for calibrating circulation and sediment transport models for Task Two.

Survey Methods

PEI proposes three (3) phases to complete the initial scope of work.

Phase 1 – Background Research

Prior to initiation of field activities, PEI will conduct background research and coordinate with NMFS/USACE staff to identify literature and existing resource maps within the action and mitigation areas, subject to field verification (Phase 2). PEI will utilize the materials to develop its survey strategy. Summer’s End will coordinate with the USACE and NMFS based on the results of the background assessment (memorialized in the form of a map and technical memorandum) to assure the identification of ESA-listed corals in the project’s action and mitigation areas.

Phase 2 – ESA-listed Coral Survey and Critical Habitat Delineation

PEI will conduct a comprehensive assessment survey of ESA-listed corals and critical habitat located at the mouth of Coral Harbor to verify mapped resources obtained during background research and results from bathymetric and side-scan sonar data. PEI will survey reefs located off Harbor Point and Pen Point which are positioned along the east and west shorelines lining the entrance to Coral Harbor. While these reefs were originally reported to occur within the project’s “mitigation area,” (Environmental Assessment Report (April 2014)) NMFS has expressed concern that these reefs may be affected by the proposed action (NMFS RAI 26 September 2018) and may occur within the USACE expanded 114-acre “action area”. In an effort to maximize location and identification of all ESA-listed corals occurring on these two reefs, PEI will systematically cover each reef using a series of transects traversing the reef structure. PEI will swim each transect providing 100% visual coverage over the entirety of the reef to maximize the location and identification of ESA-listed corals. PEI’s qualified scientists will identify, delineate, and quantify critical habitat with suitable substrate to support successful larval settlement, recruitment, and reattachment of ESA-listed corals. Upon completion of the ESA-listed coral survey, a map will be prepared showing the location of such resources occurring on the reef structures near the entrance to Coral Harbor. PEI will utilize scuba during most survey activities and snorkel areas too shallow to access with scuba equipment. PEI is familiar with and will follow the new guidelines for decontaminating scuba equipment before starting any survey activities. All ESA-listed corals observed during the survey will be identified, measured for colony size, and photographed. Measurements of colony size will include length, height, and width. Percent live tissue will be estimated for each colony, in 10% increments. Colony health and the symptoms of disease will be documented. The location along each transect and depth of ESA-listed corals observed during the survey will be recorded so that a map showing colony locations can be generated.



Phase 3 – Feasibility of Proposed Compensatory Mitigation and Identification of Viable Options

As partial mitigation for the proposed action, the Compensatory Mitigation Plan (December 2017) discussed collection of Hurricane Irma debris and securing/reattaching dislodged ESA-listed corals in areas throughout the 750-acre “mitigation area” in Coral Bay. To determine feasibility of such compensatory mitigation, PEI will conduct reconnaissance dives in select areas throughout the proposed 750-acre “mitigation area” to identify the presence of debris and dislodged ESA-listed corals. Additionally, PEI will assess environmental conditions in the “mitigation area” to identify alternative options for compensatory mitigation.

Refining Compensatory Mitigation

Upon completion of the proposed geotechnical, circulation model, flushing analysis, and benthic studies, the data results will be analyzed and fully evaluated. The final analysis of this data will be used to refine the proposed compensatory mitigation plan, identify other areas of impact, and to maximize mitigation success. Based on recent discussions with NMFS proposed mitigation will include, as a priority, reducing areas with significant storm water and sediment run-off, restoring damaged SAV, and debris removal.



Exhibit A: Bathymetric Survey Transects – Coral Bay



Exhibit B: Bathymetric Survey Transects – Marina Footprint