

## **EXECUTIVE SUMMARY**

### **Recommendation to approval Yearly Physical Beach and Inlet Monitoring Contract as proposed by PBS&J.**

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**OBJECTIVE:** Approve the Yearly Physical Beach and Inlet Monitoring Contract as approved by PBS&J.

**CONSIDERATIONS:** Yearly physical monitoring of the beaches and inlets is required by FDEP permit.

**ADVISORY COMMITTEE RECOMMENDATIONS:** At the June 10, 2010 CAC meeting this item was recommended for approved 6 to 1. Staff is recommending approval of the attached proposal by PBS&J.

**FISCAL IMPACT:** The Source of funds is from Category "A" Tourist Development Tax fund 195.

**GROWTH MANAGEMENT IMPACT:** There is no impact to the Growth Management Plan related to this action.

**LEGAL CONSIDERATIONS:** This item has been reviewed and approved by the County Attorney's Office and is legally sufficient for Board action. - CMG

**RECOMMENDATION:** To approve Yearly Physical Beach and Inlet Monitoring Contract.

**PREPARED BY: Gary McAlpin, CZM Director**

**Professional Engineering Services  
for  
Fixed Term Physical Monitoring Services for Coastal Management**

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**PBS&J** is pleased to provide a scope of work for Collier County Coastal Zone Management Department. The intention of this Work Assignment is to provide professional guidance, preparation of project documentation (monitoring reports) and expert review of project information for the Physical Monitoring of the Collier County coastline. In accordance with Collier County Contract Number 08-5124 the following scope of work is presented herein.

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**SCOPE OF SERVICES**

This monitoring will take place on various beaches and inlets of Collier County as indicated below. The following is a list of expected monitoring locations. These locations are inclusive but may vary from year to year depending on permit conditions. Please refer to previous monitoring reports for exact boundaries, survey locations, ranges and control monuments. Consistency with previous surveys is extremely critical and significant to Collier County. Contractors/consultants will have the responsibility to complete monitoring for the respective beach segment during the times indicated for each segment. Locations and monitoring timing is as follows

- Vanderbilt Beach physical beach monitoring and report performed in May – June each year.
- Park Shore Beach physical beach monitoring and report performed in May - June each year.
- Naples Beach physical monitoring and report performed in May - June each year.
- South Marco Beach physical monitoring and report performed in December - January each year.
- Delnor-Wiggins State Park Beach physical monitoring and report performed in April – May each year.
- Clam Pass Beach physical monitoring and report performed in April – May each year.
- Wiggins Pass Inlet/interior channel/borrow area and report performed in April – May each year.
- Clam Pass inlet and interior channel performed in April – May each year.
- Doctors Pass inlet and interior channel performed in May - June each year.
- Caxambas Pass inlet/borrow area performed in December – January each year.
- Hideaway beach borrow area performed in December – January each year.

**Beach and Nearshore Hydrographic Survey**

All work shall be conducted in accordance to Section 01000 (Beach Profile Topographic Surveying) and 01100 (Offshore Profile Surveying) of the March 2004 Bureau of Beaches and Coastal Systems Monitoring Standards for Beach Erosion Control Projects including field methodology and final deliverables. <http://www.dep.state.fl.us/beaches/publications/pdf/standard.pdf>

Prior to the start of the survey a reconnaissance of FDEP second order monuments is required to confirm that survey control is in place and undisturbed using Real Time Kinematic Global Positioning System (RTK GPS). In order to achieve required accuracy, the survey shall be controlled using FDEP 2nd order monuments. All assessable 2nd and 3rd order FDEP control monuments in the project area shall be located using RTK GPS.

Topographic and Hydrographic profile surveys will be collected. All data seaward of the dune shall be collected using RTK GPS technology. Upland areas inaccessible to RTK GPS shall be collected using

standard differential leveling techniques. Upland topography shall extend approximately 150 feet landward of the vegetation line or until an obstacle is encountered.

An ACSM Certified Hydrographer shall oversee all hydrographic surveys for nearshore, offshore and inlet surveys. Hydrographic portions of the profile line shall be collected from a survey vessel equipped with RTK GPS technology and a dynamic motion sensor to provided instantaneous tide and motion corrections. Standard hydrographic procedures shall be followed including all necessary quality control checks. Horizontal and vertical positioning checks will be conducted at the beginning and end of each day using second order FDEP monuments located in the project area. The fathometer will be calibrated via bar-checks and a sound velocity probe at the beginning and end of each day. The DIGIBAR PRO sound velocity meter or equivalent which provides a fast additional calibration for sound velocity as compared to the traditional bar check shall be used. More specifically, bar checks will be performed from a depth of five feet to a maximum depth of twenty-five feet. Analog data showing the results of the bar check calibration will be displayed on the fathometer charts at five foot increments during descent and ascent of the bar.

In order to maintain the vessel navigation along the profile lines HYPACK navigation software or equivalent shall be used. This software shall provided horizontal position to the sounding data allowing real-time review of the profile data in plan view or cross section format. The navigation software shall also provided navigation to the helm to control the deviation from the online azimuth. The landward limits of the hydrographic survey shall be based on a minimum of fifty feet beyond the seaward extent of the beach profile. Profiles shall extend seaward beyond the depth of closure, or 2,500 feet offshore, whichever is further.

A Professional Surveyor and Mapper (PSM) shall signed and sealed the required DEP survey reports which shall included field survey notes, profile plots, GIS plan view maps, photographs in both directions along the beach and towards the dune also a close-up of the monument when found as well as all other required deliverables included in Section 0100 and 01100 of the FDEP Monitoring Standards for Beach Erosion control Projects <http://www.dep.state.fl.us/beaches/publications/pdf/standard.pdf>. Four copies of the report along with a CD version will be provided to the County.

### **Navigation Channel and Interior Inlet Hydrographic Survey**

Nearshore cross-sections will be surveyed as per the previous post-construction survey events. An ACSM Certified Hydrographer shall oversee the hydrographic survey. All work will be conducted in accordance to Section 01200 (Borrow Site, Shoal and Other Bathymetric Surveying) of the March 2004 Bureau of Beaches and Coastal Systems Monitoring Standards for Beach Erosion Control Projects.

Cross-sections will be collected from a survey vessel equipped with RTK GPS technology and a dynamic motion sensor to provided instantaneous tide and motion corrections. Standard hydrographic procedures shall be followed including all necessary quality control checks. Horizontal and vertical positioning checks will be conducted at the beginning and end of each day. The fathometer will be calibrated via bar-checks and a sound velocity probe at the beginning and end of each day. The DIGIBAR PRO sound velocity meter or equivalent which provides a fast additional calibration for sound velocity as compared to the traditional bar check shall be used. More specifically, bar checks will be performed from a depth of five feet to a maximum depth of twenty-five feet or a depth representing the maximum potential depth of

the survey area. Analog data showing the results of the bar check calibration will be displayed on the fathometer charts at five foot increments during descent and ascent of the bar. In order to maintain the vessel navigation along the profile lines HYPACK navigation software or equivalent shall be used. This software provided horizontal position to the sounding data allowing real-time review of the profile data in plan view or cross section format. The navigation software will also provided navigation to the helm to control the deviation from the online azimuth.

### **Controlled Aerial Photography Using FDEP Environmental Standards**

Color aerial photography shall be obtained for the Collier County Beaches. Surveyors shall coordinate ground control and GPS logging from HARN and/or CORS with the designated sub-contractor. A representative from Collier County will conduct the pre-flight sea condition monitoring and coordinate with the surveyor and the sub-contractor about the flight timing. Flight must occur during a 24 hour period of calm sea conditions, low tide levels, and low sun/water surface angle to ensure good water clarity. The flight window will be established by the sub-contractor. The sub-contractor shall provide 9"x9" photographs and CD-ROM controlled raster imagery files. The photography will be collected following FDEP's standards for:

Environmental Aerial Photography Acquisition for Beach Erosion Control Projects  
<http://www.dep.state.fl.us/beaches/publications/pdf/standard.pdf> (section 02000:March2004).

### **Preparation of Post-Project Monitoring Reports**

In accordance with FDEP permit protocol; PBS&J shall prepare the second year monitoring reports for submission to the Florida Department of Environmental Protection (FDEP) Bureau of Beaches and Coastal Systems (BBCS) on behalf of Collier County.

Data collected for the monitoring of the project shall include beach profile surveys, borrow area surveys and aerial photography. These data will be collected by Morgan & Eklund, Inc for the topographic & bathymetric survey information and Aerial Cartographics of America, Inc for the aerial photography. The purpose of the monitoring reports is to summarize and discuss the data, the performance of the beach fill project, and identify erosion and accretion patterns within the monitored area. In addition, the report shall include a comparative review of adverse impacts attributable to the project(s). Based on the scope of work requested by Collier County, PBS&J will only address Range Monuments R-10 through R-89 and R-140 through R-148. PBS&J will review the data and use the information to create a database to identify and characterize trends and current conditions of these reaches of Collier County's coastline. The database will be created to enable visualization and completion of a comparative analysis.

Specific quantities and parameters that will be analyzed, if data are available, include the following:

- Shoreline and volume change rates
- Beach profile evolution
- Post-storm beach profile change (if applicable)
- Bathymetry changes within Wiggins Pass, Doctor's Pass, Capri Pass and Caxambas Pass
- Identifying and quantifying areas of acute erosion
- Bathymetry changes across the borrow areas
- Aerial photography assessment

The above analyses will provide a qualitative understanding of the project and/or storm-induced topography and bathymetry changes to the beach and borrow area.

All monitoring reports will include a transmittal referring to applicable FDEP permits, the permit condition requiring the report and the period in which the monitoring was conducted. The reports will be submitted as a bound printed report and on a disk in electronic .pdf format.

PBS&J will prepare for, travel to and attend three (3) meetings. The meetings will be held to coordinate the project, meet with County staff, and to provide project updates to the County Project Manager and other stakeholder representatives as deemed necessary and appropriate. One PBS&J senior engineer will attend each of these meetings, again as deemed appropriate.

PBS&J will complete monthly updates to County staff on the schedule, task and present budget of the project. In addition, quarterly progress reports will be prepared that outline project expenses to date and review the budget and schedule.

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### **Budget Estimate**

Work for this assignment will be performed for the lump sum amount of **\$196,195.13**. Work will be billed to the County on a monthly basis based on the percentage of work completed for the preceding month.

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### **Schedule Estimate**

The following schedule of completion is anticipated.

1. Submit draft monitoring reports within **120** calendar days following the Notice-to-Proceed and receipt of all required data (surveys and aerial photography) to complete analysis.

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### **Assumptions**

1. All existing information/documentation including, but not limited to, survey data, project permits, environmental information, aerial photography, previous studies, etc. will be provided to the PBS&J by the County.
2. This quote is based upon project scope outlined in BVO 08-5124 and conversations with County Staff on June 4<sup>th</sup> and June 7<sup>th</sup>, 2010.
3. No biological monitoring of artificial reefs or hardbottom are included in this scope of work.
4. No side-scan sonar or diver verification of seagrasses, artificial reefs or hardbottom are included in this scope of work.
5. Aerial photography will be flown to FDEP BBCS 02000 Specifications per County direction.

**Collier County Physical Monitoring**

	<b>Cost</b>	<b>Area of survey</b>
Task 1 Vanderbilt Beach	\$4,200.00	R-23 to R-29
Task 2 Park Shore Beach	\$7,800.00	R-45 to T-57
Task 3 Naples Beach	\$19,200.00	T-58 to R-89
Task 4 South Marco Beach	\$5,400.00	R-140 to T-148
Task 5 Hideaway Beach & T-Groins	N/A	Not in this survey
Task 6 Delnor-Wiggins State Park Beach	\$7,800.00	R-10 to R-22
Task 7 Clam Pass Beach	\$9,000.00	R-30 to R-44
Task 8 Wiggins Pass Inlet/Interior Channel/ Borrow Area Monitoring	\$15,000.00	Cost based on coverage of pass, flood and ebb shoals, may change based on County supplying number of lines to be run.
Task 9 Clam Pass Inlet and interior channel monitoring	N/A	Not in this survey
Task 10 Doctor's Pass Inlet/Interior Channel Monitoring	\$15,000.00	Cost based on coverage of pass, flood and ebb shoals, may change based on County supplying number of lines to be run.
Task 11 Caxambas Pass Inlet/Borrow Area Monitoring	\$15,000.00	Cost based on coverage of pass, flood and ebb shoals, may change based on County supplying number of lines to be run.
Task 12 Capri Pass/Hideaway Beach Borrow Area Monitoring	\$15,000.00	Cost based on coverage of pass, flood and ebb shoals, may change based on County supplying number of lines to be run.
Task 13 Near shore hard bottom Biological Monitoring	N/A	Not in this survey
Task 14 Biological Monitoring on one acre of artificial reef	N/A	Not in this survey
Task 15 Sea grass monitoring at Hideaway Beach	N/A	Not in this survey
Task 16 Coastal Engineering Monitoring Report	\$64,446.00	
Task 17 Aerial photography completed to DEP 2000 specs for beach monitoring	\$18,349.13	Includes engineering analysis of areas in Tasks 1-12 Includes aerials of areas in Tasks 1-12
	<b>TOTAL \$196,195.13</b>	

Assumptions

- 1 No Clam Pass Inlet and interior monitoring
- 2 No near shore hardbottom biological monitoring
- 3 No artificial reef biological monitoring
- 4 No biological monitoring of seagrasses
- 5 No side scan sonar or diver verification