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**PORT OF HOUSTON AUTHORITY
BAYPORT SHIP CHANNEL IMPROVEMENTS
HARRIS AND CHAMBERS COUNTIES, TEXAS**

Oyster Mitigation for Proposed Bayport Ship Channel Improvements

November 2011

SWG-2011-01183
ATTACHMENT I
SHEET 1 OF 3.

Oyster Mitigation for Proposed Bayport Ship Channel Improvements

1.0 SUMMARY

The primary purpose of the mitigation project is to replace the oyster habitat that would be removed by construction of the Bayport Ship Channel (BSC) improvements through restoration of oyster habitat on Fisher's Reef in Trinity Bay, Chambers County, Texas. Specifically, the mitigation plan proposes to add approximately 3,710 cubic yards (cy) of cultch (limestone, clean, crushed concrete rubble, or other material acceptable to the Texas Parks and Wildlife Department) to 4.6 acres on Fisher's Reef to compensate for the impacts associated with the proposed deepening and widening of the BSC. If the proposed new beneficial use (BU marsh placement option is chosen for placement of dredged material, an additional approximately 5,970 cy of cultch would be added to another 7.4 acres on Fisher's Reef to compensate for the berm impacts. This would increase the existing oyster habitat in Trinity Bay by making up to 12 acres of hard surface area available for natural recruitment of oyster larvae. The Fisher's Reef area was recommended by the Texas Parks and Wildlife Department (TPWD) as the preferred location for oyster reef restoration at the request of the Beneficial Uses Group. The new BU Marsh feature may be reconfigured and repositioned within the Proposed New BU Marsh Permit Area shown in Sheet 2 of 6 of the permit application during more detailed or final design. The Applicant would mitigate any additional oyster reef impacts in excess of the 7.4 acres proposed currently for mitigating the current configuration, by adding cultch to Fisher's Reef at a 1-acre impacted-to-1-acre mitigated ratio. Cultch would be added at the same density and thickness as that used for mitigating the 7.4 acres of impact. The acreage of oyster reef impacted would be determined using the 2011 benthic characterization survey data used to determine project impacts. This data consisted of sidescan sonar data groundtruthed by diver, and covered an area encompassing the Proposed New BU Marsh Permit Area. Fisher's Reef was impacted by Hurricane Ike-induced sedimentation in 2008. This large-scale oyster restoration would provide important ecological benefits to Galveston Bay, such as improvement of water quality and clarity as well as re-establishment of essential fish and invertebrate habitat.

2.0 BACKGROUND

The two Fisher's Reef areas selected were chosen for maximum water depth and minimum sediment overburden based on post-Hurricane Ike TPWD side-scan sonar data and sub-bottom profiling data collected by Texas A&M University at Galveston. One reef footprint is in a shellfish harvesting area, and the other reef footprint is in waters restricted from shellfish harvest, thus allowing for research on harvested versus non-harvested adjacent oyster reefs. Cultch material would be placed in a layer approximately 6 inches deep, depending on sediment depth. In discussions with TPWD, a one-to-one acreage replacement of oyster habitat would be appropriate mitigation.

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3.0 MONITORING

Monitoring of the restoration sites would be conducted pre- and post-restoration to assess the success of the project. Criteria for restoration success would include one structural and one functional endpoint. The structural endpoint would be the number of reef acres restored. Pre-restoration and post-restoration side scan-sonar data would be collected and processed into ArcGIS data layers. Restored reef acreage would be quantified by subtracting pre-restoration reef acreage from post-restoration reef acreage to determine the amount of habitat restored. Success would be defined as an increase in reef acreage of at least 4.6 or 12 acres, dependent on if the new beneficial use marsh placement option is chosen. The functional endpoint would be oyster density (oysters per square meter [oysters/m²]). Oyster density would be measured using the diver quadrat method twice a year (pre- and post-oyster harvest season) for three years. SCUBA divers would sample random points along a transect line by placing a 0.25 square meter quadrat on the bay bottom and placing all shells and live oysters from within the quadrat into a mesh bag. All live oysters would be enumerated and a maximum of 10 individuals would be measured for shell length. Success would be defined as a post-restoration oyster density equal to or greater than densities observed during a pre-construction survey of a nearby control site chosen by TPWD. When the success criteria are met, the monitoring would cease and the mitigation project would be determined to be successful.

4.0 REPORTING

The first report would include the findings of the restored reef acreage as determined by side-scan sonar and would be submitted no later than 90 days after placement of the reef substrate. The results of all monitoring activities would be summarized annually. The following three annual reports would include the oyster density findings of the SCUBA divers, including when the post-restoration oyster density success criteria was met.

If the proposed mitigation is not meeting the success criteria within three years, the USACE District Engineer would be notified as soon as possible so that the mitigation can be evaluated and measures pursued to address deficiencies of the mitigation.

5.0 LONG-TERM MANAGEMENT

After the success criteria are met, the long-term management of the mitigation area would be conducted by the appropriate local, state, and federal agencies that regulate oyster reefs.

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