La Quinta Terminal Mitigation Project

Large scale dredged material beneficial re-use facility for estuarine habitat creation in Corpus Christi Bay, TX

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La Quinta Channel Extension and Aquatic Habitat Mitigation Background

- **2004 - 2012**: La Quinta Channel Extension Project Development
- **2013**: La Quinta channel extended 1.4 miles at depth 39’
- **2014**: La Quinta deepened to 47’
- **2014**: Beneficial Use Site (BUS) 6 constructed using dredged material

**Site Monitoring**

- **2017**: Phase II Aquatic Habitat Mitigation Berms constructed and planted
- **2016 - 2017**: Phase II Protection Berm constructed
- **2015 - 2016**: Phase I Aquatic Habitat Mitigation Berms constructed and planted
Beneficial Use Site (BUS) 6
Construction
La Quinta Channel Extension and BUS 6 conceptual drawing
Offshore emergent levee material placement, first pass.
Riprap Shore protection construction.
BUS-6 aerial immediately after completion
La Quinta Aquatic Habitat
Terminal Mitigation Phase I
Objectives

- Mitigation berms conducive to propagation of Smooth Cordgrass (*Spartina alterniflora*) estuarine marsh habitat.
- Maximize plantable surface while minimizing fill.
- Account for RSLR over 20 years

Solutions

- Optimal elevations for survival evaluated based off existing vegetation in vicinity.
- Tidal channels to provide maximum circulation and minimal berm erosion.
- Elevated crest to account for RSLR.
- Wave conditions evaluated to ensure site conditions at site are below threshold for healthy growth.
- Alternatives evaluated different berm dimensions, channel depths, and configuration.
Objectives

- Mitigation berms conducive to propagation of Smooth Cordgrass (*Spartina alterniflora*) estuarine marsh habitat.

Solutions

- Habitat bench at elevation to allow for partial inundation throughout each tidal cycle.
- Elevated crest for Smooth Cordgrass to continue to grow as sea level rises.
- Channels to promote water circulation throughout site.
Phase I Mitigation Berm Construction

[Image of construction site with labeled elements: Armored Offshore Emergent Levee, Marsh Excavator, Completed Mitigation Berm]
Phase I Mitigation Berm Construction
Phase I Mitigation Berm Construction
Phase I Mitigation Berm Construction
Phase I Mitigation Berm Planting
Phase I Mitigation Berm Planting

7.9 acres of Smooth Cordgrass (*Spartina alterniflora*) planted
La Quinta Aquatic Habitat
Terminal Mitigation Phase II
LA QUINTA AQUATIC HABITAT TERMINAL MITIGATION PHASE II

FINAL DESIGN

**Protection berm**
- 1,500’ long
- Geotextile fabric scour apron
- Ultraviolet light protection shroud

**Mitigation berms**
- 2 acres
- Elevations to allow for partial inundation throughout each tidal cycle
- Channels to promote water circulation throughout site.

**Planting**
- 20 acres of shoal grass (*Halodule wrightii*)
- 2 acres of smooth cordgrass (*Spartina alterniflora*)
Protection Berm Construction

Fine to coarse sands

Hydraulically pumped 1.5 miles through 10" HDPE pipeline.
PA-14 material harvesting operations

Slurry created using bay water.
Turbidity control

Silt curtains

Silt curtains
LA QUINTA AQUATIC HABITAT TERMINAL MITIGATION PHASE II
FINAL DESIGN
Scour anchor installation and anchor tube filling

Grading operations

100’ sections
Installed immediately after grading

Anchor tube filled with excess material pumped from protection berm
Shoal Grass Planting (*Halodule wrightii*) Areas
Shoal Grass Planting (*Halodule wrightii*)

- Harvested shoal grass transplant unit
- Contractor soaking units prior to planting
Shoal Grass Planting (*Halodule wrightii*)

97,656 total units installed.

Harvesting and planting tools
Smooth Cordgrass Planting (*Spartina alterniflora*)

Base Bid included 2 acres of planting

9,700 units installed.
Smooth Cordgrass Planting (*Spartina alterniflora*)

**TRANSPLANT SURVIVAL SURVEY**

- 2 acres of smooth cordgrass planted
- Over 90% transplant survival rate
- Evenly distributed
Post Construction:
Hurricane Harvey
Hurricane Harvey Stats

- Aug 25, 2017
- Category 4 Storm: 130 mph winds
- Winds near site >100 mph
- Storm Surges above 5’ observed near the project site
- Storm conditions far exceeded protection berm design conditions