Alabama State Port Authority

Artist's Rendering - Arlington Park

CHOCTAW POINT TERMINALS MITIGATION PROJECT

2009 AAPA ENVIRONMENTAL AWARDS COMPETITION
MITIGATION CATEGORY

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PROJECT SUMMARY
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The construction of the Choctaw Point Complex was shown to effect approximately 24 acres of wetland, 21 acres of shallow-water bottoms (less than 6.6 feet deep) and 27 acres of deep-water bottom. In turn, the U.S. Army Corp of Engineers required mitigation actions be undertaken to counterbalance the land development and loss of wildlife habitat. A 57-acre mitigation plan was developed and involved converting uplands to tidal fringe marsh.

ASPA fulfilled the U.S. Army Corp of Engineer's mitigation requirements by constructing almost 25 acres of tidal fringe marsh on a portion of Arlington Cove to compensate for the loss of wetlands, as well as 17.4 acres of tidal fringe marsh along North Garrows Bend and 14.5 acres of tidal fringe marsh at the south-end of McDuffie Island, which together compensated for the loss of essential fish habitat. In addition to meeting the project mitigation requirements, the Arlington Cove parcel contained enough additional upland acreage to develop a public park with waterfront access to Mobile Bay. The approximately 16-acre Arlington Park will have public transit access, public parking areas, hiking and bike trails, a boardwalk to a new fishing platform with pier and kayak launch sites; as well as new gazebos, picnic facilities, restrooms and landscaping.

Benefits to the environment which accrued from the Choctaw Point project included:

- Redevelopment of approximately 370 acres of Brownfield property with numerous contaminated sites including several liquid bulk petroleum terminals, a former creosote wood treating plant, and a former rail yard.
- Utilization of approximately 500,000 cubic yards of dredged material as fill material for the construction site.
- Conversion of approximately 56.6 acres of uplands to high quality tidal marsh.
- Development of a public park with waterfront access to Mobile Bay, including a canoe and kayak launch.

The project utilized several creative solutions to unique challenges posed by the project, including the development of a customized protocol for evaluating wetland impacts, a hydrologic study to assure that site-specific conditions were understood and inclusion of additional wetland acreage to mitigate for and additional project.

The project has exceeded all expectations to date. The marshes planted have flourished and provide excellent habitat for a variety of fish and birds. Soils excavated from mitigation sites were used as valuable fill materials in the development projects, resulting in overall cost-effectiveness. The success of the project demonstrates the importance of community involvement throughout a mitigation project and the significance of a cooperative working relationship with regulatory agency officials.

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INTRODUCTION

Choctaw Point Complex is the centerpiece of the Alabama State Port Authority's long-term, multi-year Strategic Development Plan for the Port of Mobile. Choctaw Point Complex is comprised of three components; a 135-acre marine terminal; an 80-acre Garrows Bend Intermodal Container Transfer Facility (ICTF); and a 70-acre logistics park. Phase I of the intermodal project included a $300 million marine terminal equipped with 2,000-feet of deepwater berth, up to six Post-Panamax container cranes and state-of-the-art container handling equipment. Mobile Container Terminal, a joint venture between the Port Authority, APM Terminals North America and Terminal Link (CMA CGM), completed Phase I construction and opened for business in October last year.

The Port Authority's overall plan for Choctaw Point includes a near dock intermodal rail terminal to complement Mobile Container Terminal to maximize throughput utilizing access to five Class I railroads. Site work has already begun for the Garrows Bend ICTF with an anticipated Phase I completion schedule for early 2011. The third component to the Choctaw Point project is a planned logistics park located adjacent to the intermodal rail yard and fronting Interstate 10.

The proposed construction of the Choctaw Point Complex was shown to effect approximately 24 acres of wetland, 21 acres of shallow-water bottoms (less than 6.6 feet deep) and 27 acres of deep-water bottom. In turn, the U.S. Army Corp of Engineers required mitigation actions be undertaken to counterbalance the land development and loss of wildlife habitat. A 57-acre mitigation plan was developed and involved converting uplands to tidal fringe marsh.

Ideally the fringe marshes would be on property the Port Authority's already owned. However, sufficient sites were not available and additional land had to be acquired. The Port Authority was able to obtain a 40.98-acre parcel of land from the Mobile Airport Authority located on Arlington Cove, adjacent to the Choctaw Point Complex.

With the property acquisition, ASPA fulfilled the U.S. Army Corp of Engineer's mitigation requirements by constructing almost 25 acres of tidal fringe marsh on a portion of Arlington Cove to compensate for the loss of wetlands, as well as 17.4 acres of tidal fringe marsh along North Garrows Bend and 14.5 acres of tidal fringe marsh at the south-end of McDuffie Island, which together compensated for the loss of essential fish habitat. In addition to meeting the project mitigation requirements, the Arlington Cove parcel contained enough additional upland acreage to develop a public park with waterfront access to Mobile Bay. The future Arlington Park will be one of four public bayfront parks on Mobile Bay's western shore.

The approximately 16-acre Arlington Park will have public transit access, public parking areas, hiking and bike trails, a boardwalk to a new fishing platform with pier and kayak launch sites; as well as new gazebos, picnic facilities, restrooms and landscaping.

Additional benefits to the environment which accrued from the Choctaw Point project included the cleanup of numerous Brownfield properties and the beneficial reuse of approximately 500,000 cubic yards of dredged material from the Port Authority's dredged material management areas.

GOALS AND OBJECTIVES

The primary goal of the project was regional economic development through improved intermodal container handling capabilities. The environmental objectives for the project were as follows:

- Redevelop approximately 370 acres of Brownfield property with numerous contaminated sites including several liquid bulk petroleum terminals, a former creosote wood treating plant, and a former rail yard.
- Utilize approximately 500,000 cubic yards of dredged material as fill material for the construction site.
- Convert approximately 56.6 acres of uplands to high quality tidal marsh.
- Develop a public park with waterfront access to Mobile Bay, including a canoe and kayak launch.

BACKGROUND

Initial measures to address needs for increased port expansion and development began in the 1970's with the purchase of land in the Choctaw Point-Garrows Bend area. Redevelopment of these parcels was delayed for years due to concerns about the presence of numerous areas of known contamination. These areas included petroleum terminals, rail yards and a wood treating facility, all with operations dating back to the early 1900's.

However, with the diminishing supply of waterfront property along the Ship Channel, the property had become too valuable to avoid developing any longer. In the late 1990's, the Alabama State Port Authority began the process of evaluating potential uses for this highly valuable, but underutilized, property. In May 2002, a Development Master Plan was completed which concluded that the location was well-suited for a Container Port and Intermodal Transfer Facility.

Figure 1 – Choctaw Point, Circa 1969 and Today

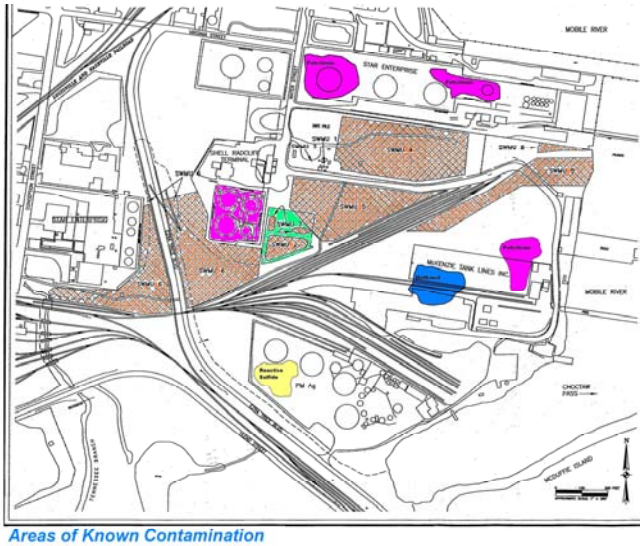
OBJECTIVES AND METHODOLOGY

The primary project objective was to redevelop approximately 370 acres of valuable Brownfield property into a container terminal, intermodal transfer facility and logistics park. Development of

the overall project required the filling of approximately 24.3 acres of low quality wetlands and approximately 47.4 acres of essential fish habitat consisting primarily of water bottoms. Table 1 gives a breakdown of the types and quantities of resources impacted. Approximately 24.8 acres of the habitat to be impacted was contaminated from over 100 years of past industrial use and impacts from urban runoff.

Brownfield Redevelopment

The Choctaw Point and Garrows Bend area has a long history of industrial use dating back to the early 1900's. In addition, the primary drainage for the downtown area of the City of Mobile runs through the middle of the property. The long history of industrial use combined with the impacts of over 100 years of urban runoff has resulted in a wide variety of contaminants present on the Choctaw Point property. The Property was the location of four liquid bulk terminals, a coal tar refinery and creosote wood treating operation, and a rail yard and railcar repair facility. The Southern Drain, which handles stormwater runoff for much of downtown Mobile, runs through the property as well. The figure above shows the location and variety of known contamination on the property. For example, areas in orange are creosote contamination, purple represents petroleum contamination and yellow represents reactive sulfide. The presence of contamination was a major concern to the Port Authority when considering redevelopment of the property.



Areas of Known Contamination

However, with its location on the ship channel and its proximity to rail and interstate connections, it was an ideal location for the Choctaw Point Complex.

Assessment of Wetland Impacts

In order to accurately assess the ecological impacts to the habitat, an interagency team with representatives of USACE, U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Environmental Protection Agency, Alabama Department of Environmental Management, Alabama Department of Conservation and Natural Resources and the Alabama State Port Authority was formed. The team developed a modified Hydrogeomorphic (HGM) approach (Figure 2) for tidal fringe marsh that was tailored to address the project impacts. The HGM evaluation characterized the wetlands that would be impacted as exhibiting relatively low values when compared to other reference tidal wetland sites in Mobile Bay. Because of the relatively low values, the mitigation ratio was computed to be between 0.64 and 0.76. However due to USACE policy, a mitigation ratio of one-to-one was utilized in determining the required acreage.

Habitat Type	Amount (Acres) North of Causeway	Amount (Acres) South of Causeway	Total Amount (Acres)	Contaminated (Acres)	Uncontaminated (Acres)
Fringing Marsh Wetlands	0.8	15.7	16.5*	7.9	8.6
Scrub Shrub Wetlands	0.0	7.8	7.8	3.8	4.0
Shallow Water Habitat <6.6'	4.9	18.4	23.3	13.1	10.2
Deep Water Habitat >6.6'	24.1	0.0	24.1	0.0	24.1
Total	**29.8**	**41.9**	**71.7**	**24.8**	**46.9**

Table 1 – Wetlands and Other Aquatic Resources Impacted

The HGM approach was determined not to be applicable to Essential Fish Habitat (EFH), including water bottoms and living marine resources impacts. Therefore, an interagency consultation approach was used to determine appropriate mitigation. The same agencies identified above participated in the consultation.

Figure 2 - Modified HGM Evaluation Process Diagram

[1] Calculated mitigation ratios were less than unity. Use a ratio of 1 to 1 to assure no net loss of wetland acreage.
[2] Compensation ratios used the HGM compensation calculator (V3.3) provided by USEPA to establish the compensation ratios.

Mitigation for Impacts to Wetlands and Essential Fish Habitat

Based upon the one-to-one wetland mitigation ratio for wetlands that would be impacted, a total of 24.3 acres of wetland creation would be required. A 24.7 acre upland site, referred to as the Arlington Cove mitigation site was selected to provide mitigation for all project wetland impacts. The mitigation for impacts to EFH included the conversion of uplands, and areas with undesirable plant species, in two areas adjacent to the Choctaw Point project site. The areas were designated as South McDuffie Island (14.5 acres) and North Garrows Bend (17.4 acres).

Table 2 presents a summary of the overall mitigation concept.

Mitigation For:	Location	Acres
Wetlands	Arlington Cove	24.7
Essential Fish Habitat (includes water bottoms)	North Garrows Bend	17.4
	South McDuffie Island	14.5

Table 2 – Mitigation Summary

The areas designated as South McDuffie Island (14.5 acres) and North Garrows Bend (17.4 acres) mitigation sites were constructed in 2006-2007. Success of the tidal marsh in these two areas has far exceeded expectations. The Arlington Cove tidal marsh was constructed in 2008-2009. Based upon current plant growth rates, it is anticipated that this marsh will be completely covered by wetland vegetation by the end of the summer of 2009.

In order to accomplish construction of the tidal marsh, the upland areas selected had to be excavated from elevations ranging from +3 to +20 feet (MSL) down to an elevation of a -0.8 to +1.0 feet (MSL). Control of the elevation was critical to success of the tidal marsh creation. Tidal creeks were incorporated into the design of the tidal marsh to maintain appropriate hydrological conditions. The design of the creeks was based upon reference wetlands located around Mobile Bay.

Wetland planting included nearly 675,000 plants, obtained mostly from nearby nursery sources. The wetland planting design included a mix of marsh grass species selected to provide diversity and to fit local conditions; including smooth cordgrass (*Spartina alterniflora*), saltmeadow cordgrass (*S. patens*), big cordgrass (*S. Cynosuroides*), black needlerush (*Juncus roemerianus*), sturdy bulrush (*Schoenoplectus robustus*), common threesquare (*Sc. Pungens*), and sawgrass (*Cladium mariscus*).

The overall design resulted in a comprehensive and integrated complex of uplands, wetlands and open water to provide maximum habitat diversity. The topography, soils, and local tidal hydrology were evaluated to ensure creation of a productive marsh with adequate tidal exchange to support fish, macroinvertebrate, and wildlife communities typical of upper Mobile Bay. The design included small creeks and pools with tidal input, to increase habitat diversity for fishery species. Upland areas containing mature mast producing trees were maintained to provide a food source for wildlife.

Wetland Monitoring and Performance Criteria

A detailed monitoring plan was developed for the mitigation project and monitoring is being conducted over a 60-month period. Accomplishment of the following success criteria at the end of the 60-month period will determine that the mitigation has been successful:

- **Plants –** Aerial coverage of vegetation will be compared to a control marsh. Successful aerial coverage is achieved when the planted areas have similar density of plants as found in the control marsh.

- **Benthic Macroinvertebrates –** Success will be achieved when faunal similarity of quantitative samples taken at the planted site, and sieved through a 0.5mm mesh sieve, is at least 75 percent of the control marsh. All habitats will be sampled

- **Fish –** Success will be achieved when fish biomass is at least 75 percent of biomass of fish taken by the same method in the control marsh, and faunal similarity of fish at the two sites is at least 75 percent.

- **Soils -** Success is achieved when soils accumulate at least one (1) percent of organic matter on a dry-weight basis in the upper soil horizon.

- **Exotic/Nuisance Species –** No more than five (5) percent of the total vegetative cover within the created wetlands can be considered exotic/nuisance species. The achievement of this success criteria would be evaluated during the fourth year of the five-year monitoring program. Adaptive management and control of seed bearing individuals of exotic/nuisance species will be emphasized.

Application of the adaptive management approach will promote appropriate adjustments in microtopography, hydrology, and vegetation in response to the conditions that result from the constructed environment and nature.

Beneficial Use of Dredged Material

A secondary objective of the project was to maximize the beneficial reuse of dredged material as fill for the Choctaw Point project site. In addition, all material suitable for fill that was excavated from the 56.6 acres of uplands that was converted to wetlands was also used for project fill material.

Several potential sources of dredged material were considered for the project. One of the Port Authority's Dredged Material Management Areas contained a large amount of high quality sand that met the specifications for project fill material. Approximately 500,000 cubic yards of this material was used for project fill.

Public Waterfront Park

Public input expressed during the project development process indicated a tremendous desire for public access to the waterfront. Immediately adjacent to the Arlington Cove mitigation site was a parcel that would make an ideal waterfront park with an outstanding view of Mobile Bay. The inclusion of the park became an integral part of the Choctaw Point mitigation plan. The approximately 16-acre Arlington Park, which is currently under construction, will have public transit access, public parking areas, hiking and bike trails, a boardwalk to a new fishing platform

with pier and kayak launch sites; as well as new gazebos, picnic facilities, restrooms and landscaping.

FULLFILLMENT OF AWARD CRITERIA

Benefits to Environmental Quality, Beautification and Community Involvement

Community involvement throughout the project was critical to the design of the final mitigation solution. Three public meetings were held during project development. The overwhelming issue from the public's input was the desire for public access to the waterfront. As a result, a public park, overlooking the tidal marsh and Mobile Bay was included as a feature of the project.

Marsh vegetation planted across the sites has grown and spread much faster than the 5 years stipulated in the mitigation plan; after less than 2 years at North Garrows Bend and South McDuffie Island, and less than 1 year at Arlington Cove, marsh grasses are nearing complete cover of the restored areas. When the detailed marsh designs were developed, full cover was predicted 3 years after planting; all three marshes are ahead of that schedule.

Level of Independent Involvement by the Port

The Port Authority was the driving force throughout the project. Port Authority personnel were involved and provided project oversight from project conception through permitting, design and finally construction. The Port Authority is now entering the monitoring phase of the project.

Creativity of the Solution

The project utilized several creative solutions to unique challenges posed by the project. These challenges and their solutions are described below.

Because an approved HGM methodology did not exist for Alabama coastal fringe marsh habitat, the agencies agreed to collaborate on a modified HGM methodology tailored especially for the

Choctaw Point Terminal project. The entire modified HGM process was conducted on a consensus basis, and general agreement was reached on the various issues and evaluations involved.

Achieving the optimum elevations for the wetland planting areas was a critical design issue, as was the configuration of the constructed tidal creeks which allow flushing into and out of the wetland areas and enhance the habitat of the system. The design included a hydrologic study to assure that site-specific tidal regimes were well understood as opposed to reliance on records from tide gages not located in the immediate vicinity.

A portion of the North Garrows Bend site had been adjacent to a concrete batch plant many years ago. Waste concrete had been dumped on the property and resulted in a huge concrete monolith that had to be removed. The concrete was crushed and recycled into aggregate for use in other areas of the project.

The design objectives at Arlington Cove were modified midstream (at the 65% design stage) to add mitigation acreage for a separate and new project (Pinto Terminal). As well as being cost-effective mitigation for the Pinto terminal project, this more importantly allowed the Pinto Terminal project to receive regulatory approvals on a fast-track basis. The Pinto Terminal project is being built in support of a $3.7 billion steel mill project. If regulatory approvals had been delayed, the entire schedule for the project could have been jeopardized.

Project Results

The project has exceeded all expectations to date. The marshes planted in 2006-2007 at North Garrows Bend and South McDuffie Island have flourished and provide excellent habitat for a variety of fish and birds. The marsh planted in 2008-2009 at Arlington Cove is growing so rapidly

that full coverage is expected by the end of the summer of 2009. Construction is proceeding on the Arlington Cove Park and it will open to the public in the fall of 2009.

Figure 3 – South McDuffie Island Before and After Marsh Creation

Cost Effectiveness

Excavation of approximately 700,000 cubic yards of soil materials from the wetland planting sites was a major mitigation project cost since pre-existing elevations were as high as 20 feet above sea level. However, because the mitigation sites were selected in close proximity to corresponding Choctaw Point Terminal project construction, certain soils excavated from mitigation sites were able to be used as valuable fill materials in those projects, resulting in overall cost-effectiveness. The mitigation project design included extensive geotechnical characterization so that suitable fill materials would be identified, and construction oversight and project coordination assured maximum usage of these fill materials.

Transferability to the Port Industry

The project represents a comprehensive solution to mitigation and is applicable to any port-related mitigation project. The success of the project demonstrates the importance of community involvement throughout a mitigation project and the significance of a cooperative working relationship with regulatory agency officials. Although the project involved some unique

challenges and corresponding solutions, the real lesson to be transferred is the value of cooperation.

CONCLUSION

The Choctaw Point Mitigation project provided a multi-faceted solution to mitigate for the impacts of the construction of the Choctaw Point Complex. The success of the mitigation measures for impacts to wetlands and Essential Fish Habitat have far exceeded expectations to date. Numerous other noteworthy benefits to the environment were also achieved as a result of the project. These include the cleanup and reuse of old industrial sites, beneficial use of dredged material, improved public access to the waterfront and construction of a new public park. The citizens of Mobile and the State of Alabama will reap both the economic benefits of the Choctaw Point Complex and the environmental benefits of the mitigation project for years to come.