

US EPA ARCHIVE DOCUMENT

## **Essential Fish Habitat Assessment**

### **BFLP Ethylene Cracker Expansion Project Jefferson County, Texas**

**Prepared for**

**BASF FINA Petrochemicals, L.P.**

**Prepared by**

**Whitenton Group, Inc.**

**February 2012**

**Essential Fish Habitat Assessment  
BFLP Ethylene Cracker Expansion Project  
Jefferson County, Texas**

Prepared for

**BASF FINA Petrochemicals, L.P.**  
Port Arthur, Texas

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WGI Project No. 1125

February 2012

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## ACRONYMS

AOI	Area of Impact
BFLP	BASF FINA Petrochemicals LP
BA	Biological Assessment
CO	Carbon Monoxide
EFH	Essential Fish Habitat
EFHA	Essential Fish Habitat Assessment
EPA	Environmental Protection Agency
FMC	Fishery Management Council
FMP	Fish Management Plan
GHG	Greenhouse Gas
MAOI	Maximum Area of Impact
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NO <sub>2</sub>	Nitrogen Dioxide
PM	Particulate Matter
PSD	Prevention of Significant Deterioration
SIL	Significant Impact Level
US	United States
USGS	US Geological Survey
VOC	Volatile Organic Compound
WGI	Whitenton Group, Inc.

## 1.0 INTRODUCTION

BASF FINA Petrochemicals LP (BFLP) currently operates an ethylene cracker facility in Port Arthur, Jefferson County, Texas. The ethylene cracker facility currently has a nominal capacity of 2.45 billion pounds of ethylene per year and is currently one of the largest single train naphtha crackers in the world. BFLP proposes to expand the facility and increase the capacity to 2.76 billion pounds of ethylene per year by constructing one additional cracker furnace within the existing plant footprint, immediately adjacent to nine existing cracker furnaces. The project is subject to Prevention of Significant Deterioration (PSD) review for nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), volatile organic compounds (VOC), particulate matter (PM/PM<sub>10</sub>/PM<sub>2.5</sub>), and greenhouse gases (GHG).

The 1996 Essential Fish Habitat (EFH) amendments to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) set forth a mandate for the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS), regional fishery management councils (FMC), and other federal agencies to identify and protect important marine and anadromous fish habitat. EFH is defined in the Magnuson-Stevens Act as "...those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity<sup>2</sup>." A generic Fishery Management Plan (FMP) amendment delineating EFH for species managed by the Gulf of Mexico FMC was approved in early 1999. The generic FMP subsequently was updated and revised in 2005 and became effective in January 2006<sup>3</sup>. In addition, EFH for highly migratory species managed by the NMFS was identified in two Secretarial FMPs. The consultation requirements in the Magnuson-Stevens Act direct federal agencies to consult with NMFS when any of their activities may have an adverse effect on EFH and defines adverse effect as "any impact that reduces quality and/or quantity of EFH...[and] may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat wide impacts, including individual, cumulative, or synergistic consequences of actions<sup>2</sup>."

Whitenton Group, Inc. (WGI) (BFLP's environmental consultant for the project) has prepared the following EFH Assessment (EFHA) on behalf of the Environmental Protection Agency to provide a critical review of the proposed expansion of BFLP's ethylene cracker facility's potential direct, indirect, and cumulative adverse effects on federally managed EFH.

This EFHA is included as a supplement to the BFLP Biological Assessment (BA). More detailed information, research, and analysis can be found in the BFLP BA<sup>1</sup>.

## 2.0 PROJECT DESCRIPTION

### 2.1 PROJECT PURPOSE AND LOCATION

The purpose of the project is to expand the existing BFLP ethylene cracker facility by adding a tenth cracking furnace immediately adjacent to the nine cracking furnaces currently in operation in Port Arthur, Texas. The proposed project is located approximately 0.4 miles north-northeast of the intersection of Farm to Market Road 366 and State Highway 73 (Figure 1 - Appendix A).

Project location information:

USGS Quad	Latitude/Longitude
Port Arthur North	N29° 57' 14.11" W93° 53' 02.26"

### 2.2 CONSTRUCTION INFORMATION

Construction of the proposed expansion, associated infrastructure, and auxiliary equipment will take place within the existing facility in an area approximately 40 feet by 76 feet. No additional earth disturbance will be required outside of this 40-foot by 76-foot area, which is currently a concrete slab. The existing concrete slab will be demolished to allow installation of auger cast concrete piles and a new mat and pier foundation for the furnace. The proposed construction activities include the installation of approximately 100 steel-reinforced concrete piles, 18-inches in diameter, installed to a depth of 50 feet, within a 40-foot by 76-foot area. The construction area is shown on Figure 2 (Appendix A).

The projected construction start date is June 2012. The projected operation start date is 01 October 2013.

Detailed construction and operation information is provided in Section 4.0 of the BFLP BA<sup>1</sup>.

## 3.0 BACKGROUND INFORMATION

### 3.1 GENERAL ENVIRONMENTAL INFORMATION

#### 3.1.1 REGIONAL ENVIRONMENTAL INFORMATION

The proposed construction site is located within the Gulf Coast Prairies and Marshes eco-region of Texas<sup>4</sup> which is in the Gulf Coastal Plain physiographic province of North America<sup>5</sup>. This region borders the Gulf Coast within the state of Texas. The Gulf Coast influence creates multiple dynamic ecosystems within this ecoregion including bays, estuaries, salt marshes, and tidal flats. These ecosystems are home to an abundance and variety of wildlife including mammals, birds, reptiles, amphibians, fish, and invertebrates. This region is prime wintering grounds for migratory birds. The bays and estuaries provide EFH for several federally managed marine fish species<sup>6, 7</sup>. The proposed expansion project is located in Jefferson County, which is the eastern-most coastal county of southeast Texas.

#### 3.1.2 WATER RESOURCES

Jefferson County has abundant water resources, with its south border formed by the Gulf of Mexico, north border by Pine Island Bayou, and east border by the Neches River, Sabine Lake, and Sabine Pass. Other prominent water features in the area include Taylor's Bayou, Hillebrandt Bayou, and the Intracoastal Waterway. The low, flat topography invites freshwater and tidal influence to create a variety of aquatic ecosystems mentioned above in Section 3.1.1 Regional Environmental Information<sup>8</sup>.

Based on the background review, the water resources in the area surrounding the project site include marshlands, irrigation and drainage canals, and retention ponds. The Neches River is approximately 1.8 miles to the north of the project area at its closest point. Sabine Lake is approximately 1.1 miles to the east-southeast at its closest point.

Sabine Lake, the lower Sabine and Neches Rivers, and portions of the Intracoastal Waterway are all part of the Sabine-Neches Estuary. According to multiple sources including the Sabine River Authority, the Sabine-Neches estuary and its component waterbodies are tidally-influenced<sup>9</sup>. Sabine Lake has an average depth of 6 feet. At the south end of the lake, depths range from 1-4 feet. Depths reach up to 40 feet in dredged areas<sup>10, 11</sup>.

## 4.0 AIR QUALITY ANALYSIS RESULTS

### 4.1 AREA OF IMPACT DISPERSION MODELING RESULTS

RPS, BFLP's air quality permitting consultant for the project, performed dispersion modeling of the proposed emissions of air pollutants from the proposed expansion project in accordance with the PSD Permit requirements. According to the United States (US) Environmental Protection Agency (EPA), "dispersion modeling uses mathematical formulations to characterize the atmospheric processes that disperse a pollutant emitted by a source."<sup>12</sup> This section provides the general results of the dispersion modeling. More detailed air quality analysis results and methods are provided in Section 7.0 of the BFLP BA<sup>1</sup>.

According to the project dispersion modeling, the following two pollutant averaging periods are greater than the designated significant impact level (SIL): 1-Hour NO<sub>2</sub> and annual NO<sub>2</sub>.

The significant areas of impact (AOI)s located the farthest distance from the source in all directions were plotted to create a maximum AOI (mAOI) (theoretical) boundary, or otherwise referred to as the action area, for the 1-Hour NO<sub>2</sub> source emission. The potential impacts from the annual NO<sub>2</sub> source emission will not reach as far as the 1-Hour NO<sub>2</sub> source emission and did not contribute to the mAOI boundary. The modeling predicts all of the significant AOIs for the annual NO<sub>2</sub> source emission would be located within the existing ethylene cracker facility and TOTAL refinery boundaries (Figure 2 – Appendix F of the BFLP BA<sup>1</sup>). The modeling also predicts the densest portion of the significant AOIs for the 1-Hr NO<sub>2</sub> source emission would be located within the existing ethylene cracker facility and TOTAL refinery boundaries (Figure 1 – Appendix F of the BFLP BA<sup>1</sup>). The action area (maximum radius of approximately 2.6 miles) was utilized to analyze the potential impacts to EFH by the proposed expansion project and is demonstrated in Figure 3 (Appendix A). The results of the analysis of potential impacts to EFH are presented in Section 6.0 below.

## 5.0 EFFECTS OF THE PROPOSED ACTION ON EFH

This section presents the results of the analysis of potential impacts to federally managed EFH as a result of the proposed expansion project.

## 5.1 ESSENTIAL FISH HABITAT

The action area includes tidally influenced portions of the Neches River, the Intracoastal Waterway, and Sabine Lake. These tidally influenced habitats within the action area are located in an area (ecoregion 4) that has been identified as EFH by the Gulf FMC for postlarval, juvenile, and subadult red drum (*Sciaenops ocellatus*), white shrimp (*Litopenaeus setiferus*) and brown shrimp (*Farfantepenaeus aztecus*). Furthermore, these tidally influenced areas within the action area have also been identified by NMFS to contain EFH for juvenile blacktip sharks, bull sharks, Atlantic sharknose sharks, and both juvenile and adult bonnethead sharks<sup>13</sup>.

## 5.2 HABITAT AREAS OF PARTICULAR CONCERN

There are no EFH Habitat Areas of Particular Concern identified within, or adjacent to, the action area<sup>13</sup>.

## 5.3 POTENTIAL LAND BASED EFFECTS ON EFH

Designated EFH will not be directly impacted by construction or maintenance activities, noise pollution, or human disturbance associated with the proposed expansion project.

All wastewater associated with construction and operation of the expansion project will be treated onsite or in the neighboring TOTAL Refinery. The project would produce no additional wastewater impact. The additional water required by the project will be recycled within the Cracking System or lost to evaporation. Stormwater runoff from within the cracker facility is directed through a series of onsite ditches to a retention pond that allows runoff velocity to slow considerably, effectively allowing sedimentation to fall out of suspension and be retained in the pond system. EFH will not be impacted by wastewater as a result of the proposed expansion project.

## 5.4 POTENTIAL WATER QUALITY EFFECTS ON EFH THROUGH DEPOSITION OF AIR POLLUTANTS WITHIN EFH

This analysis is based on total emissions and dispersion modeling data provided by RPS, field survey and background review data collected by WGI, and literature review and research of potential effects of known pollutants on flora and fauna. More detailed descriptions of potential effects to flora and fauna within the proposed action area are provided in Section 8.0 of the BFLP BA<sup>1</sup>.

The general potential effects on aquatic habitats from NO<sub>2</sub> emissions include indirect, long-term effects, such as acidification or eutrophication. Acidification can be caused by direct acid deposition or leaching from adjacent terrestrial systems. Eutrophication is caused by the over enrichment of nutrients, such as nitrogen, into a system<sup>14</sup>. The predicted exposure of a concentration greater than the SIL to surface waters is infrequent (i.e., maximum 1.5% of hours in the year over Sabine Lake or the Neches River) and the concentration of airborne pollutant over large volumes of surface waters is low. Therefore, it is reasonable to assume the emission resulting from the expansion project will not affect surface water pH. Any potential pH impact would be a rare and short-term event. Indirect and short-term effects, resulting from the 1-Hour NO<sub>2</sub> source emission, are not expected.

Based on evidence provided, acidification, resulting from deposition or leaching, is not likely to occur as a result of the proposed expansion project. If acidification is not likely to occur as a result of the proposed project, the subsequent eutrophication will not likely occur.

The EFH that occurs within the action area for the 1-Hour NO<sub>2</sub> source emission will not likely be indirectly impacted by the proposed expansion project.

## 6.0 CONCLUSIONS

The proposed construction expansion activities are land-based and will not occur within EFH. EFH was identified within marine portions of the action area, which is within the action area, a maximum radius of approximately 2.6 miles from the site. This action area includes EFH located within the Neches River, the Intracoastal Waterway, and Sabine Lake. As described in Section 8.0 of the BFLP BA<sup>1</sup> and summarized in this EFH assessment, the EFH located within the action area would not be directly or indirectly impacted by air emissions resulting from the expansion project. Neither acidification, resulting from deposition or leaching, nor eutrophication in aquatic habitats is likely to occur as a result of the proposed expansion project. Therefore, the proposed expansion of BFLP's ethylene cracker facility would not have adverse impacts on EFH, and no mitigating actions would be required.

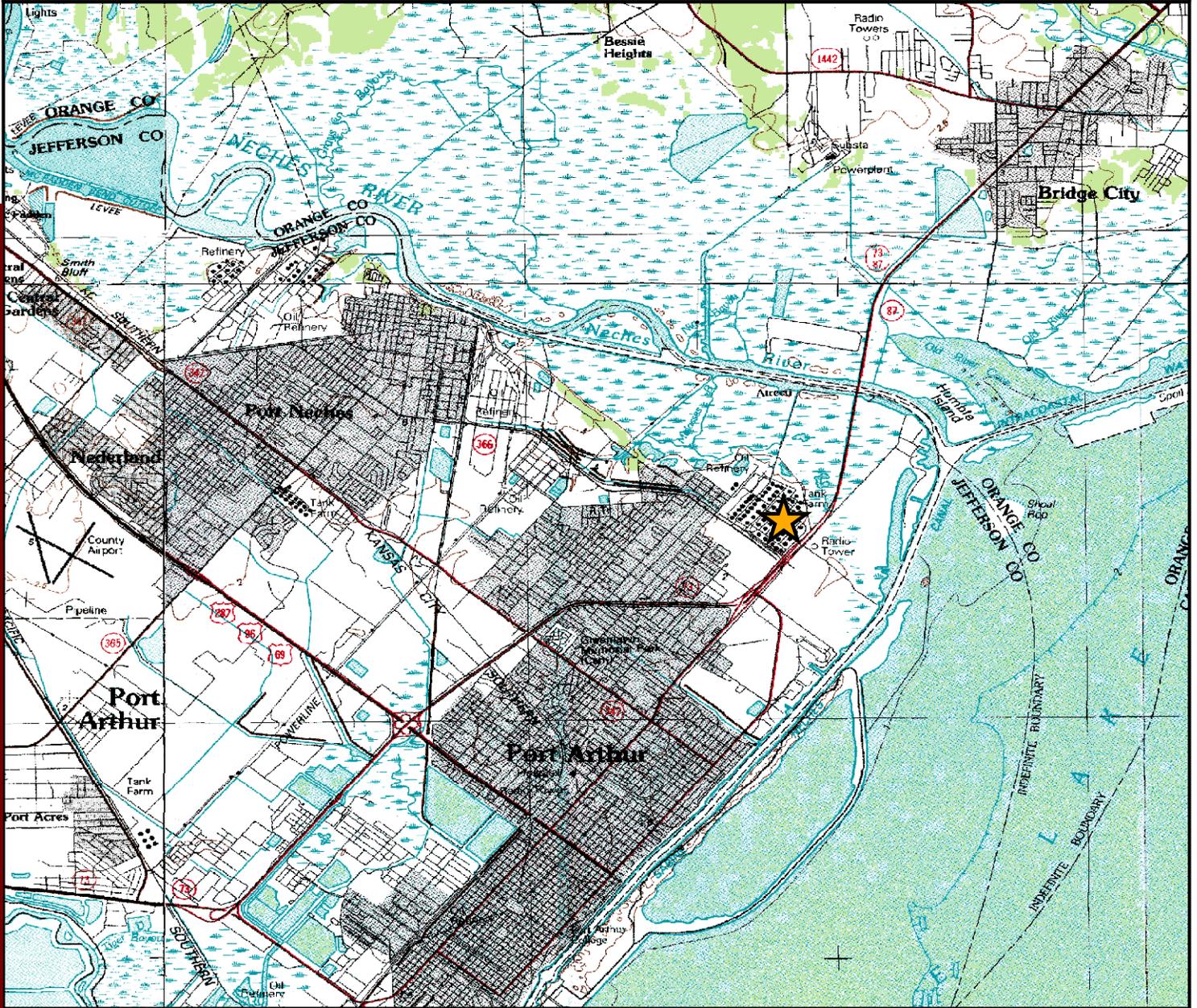
## 7.0 REFERENCES

- <sup>1</sup>Whitenton Group, Inc. Biological Assessment – BFLP Ethylene Cracker Expansion Project. <http://www.epa.gov/region6/6pd/air/pd-r/ghg/basf-fina-biological-assessment.pdf>
- <sup>2</sup>National Oceanic and Atmospheric Administration Fisheries Feature. Magnuson-Stevens Fishery Conservation and Management Act Reauthorized. <http://www.nmfs.noaa.gov/msa2005/>
- <sup>3</sup>Federal Register. 2006. Fisheries of the Caribbean, Gulf of Mexico, and South Atlantic; Gulf of Mexico Recreational Grouper Fishery Management Measures. <https://www.federalregister.gov/articles/2006/11/17/E6-19481/fisheries-of-the-caribbean-gulf-of-mexico-and-south-atlantic-gulf-of-mexico-recreational-grouper>
- <sup>4</sup>National Oceanic and Atmospheric Administration Fisheries. Preparing Essential Fish Habitat Assessments: A Guide for Federal Action Agencies. <http://www.habitat.noaa.gov/pdf/preparingefhassessments.pdf>
- <sup>5</sup>Texas Parks and Wildlife Department. Level III Eco-regions of Texas. [http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd\\_mp\\_e0100\\_1070z\\_08.pdf](http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_mp_e0100_1070z_08.pdf)
- <sup>6</sup>US Geological Survey. Physiographic Regions of the Lower 48 United States. <http://tapestry.usgs.gov/physiogr/physio.html>
- <sup>7</sup>Texas Parks and Wildlife Department. Oak-Prairie Wildlife Management, Historical Perspective. [http://www.tpwd.state.tx.us/landwater/land/habitats/oak\\_prairie/](http://www.tpwd.state.tx.us/landwater/land/habitats/oak_prairie/)
- <sup>8</sup>Texas Parks and Wildlife Department. Plant Guidance by Ecoregions, Ecoregion 2 – Gulf Coast Prairies and Marshes. [http://www.tpwd.state.tx.us/huntwild/wild/wildscapes/guidance/plants/ecoregions/ecoregion\\_2.phtml](http://www.tpwd.state.tx.us/huntwild/wild/wildscapes/guidance/plants/ecoregions/ecoregion_2.phtml)
- <sup>9</sup>University of Texas. Jefferson County Statistics and Information. <http://www.tsha.utexas.edu/handbook/online/articles/LL/hcj05.html>
- <sup>10</sup>Sabine River Authority and Texas Commission on Environmental Quality. Lower Sabine Basin Tidal Study. [http://www.sra.dst.tx.us/srwmp/tcrp/state\\_of\\_the\\_basin/special\\_studies\\_on\\_priority\\_watersheds/2006-2007/LowerSabineTidal/SabineBasinTidalStudy.pdf](http://www.sra.dst.tx.us/srwmp/tcrp/state_of_the_basin/special_studies_on_priority_watersheds/2006-2007/LowerSabineTidal/SabineBasinTidalStudy.pdf)
- <sup>11</sup>National Oceanic and Atmospheric Administration National Ocean Service Office of Coast Survey. BookletChart, Mississippi River to Galveston. [http://ocsdata.ncd.noaa.gov/BookletChart/11340\\_BookletChart\\_HomeEd.pdf](http://ocsdata.ncd.noaa.gov/BookletChart/11340_BookletChart_HomeEd.pdf)
- <sup>12</sup>US Environmental Protection Agency. Fact Sheet--Prevention of Significant Deterioration
- <sup>13</sup>National Oceanic and Atmospheric Administration Fisheries. Essential Fish Habitat Mapper. [http://sharpfin.nmfs.noaa.gov/website/EFH\\_Mapper/map.aspx](http://sharpfin.nmfs.noaa.gov/website/EFH_Mapper/map.aspx)

<sup>14</sup>Gary M. Lovett and Timothy H. Tear. *Threats from Above, Air Pollution Impacts on Ecosystems and Biological Diversity in the Eastern United States*. (Institute of Ecosystem Studies and The Nature Conservancy, 2008).

**APPENDIX A**  
**FIGURES**

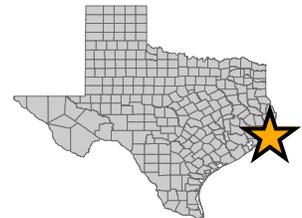
# Figure 1 Project Location BFLP Ethylene Cracker Expansion Project Jefferson County, Texas



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Project Location



Background Resources:  
USGS 100K DRG  
Port Acres, Beaumont East  
Port Arthur North, Terry

Surveyor(s):  
Jayme Shiner PWS

Project Number and Information:  
1125  
BFLP Ethylene Cracker Expansion  
Biological Assessment

**Whitenton Group, Inc.**  
ENVIRONMENTAL CONSULTANTS

3413 Hunter Road San Marcos Texas 78666

GPS and Coordinate Type:  
Trimble Geo XT  
UTM NAD 1983  
Zone 15 North

Map Created:  
06/28/2011 by Jayme Shiner

0 3,750 7,500 15,000 Feet



**Figure 2**  
**Construction Area - 2010 Aerial Photograph**  
**BFLP Ethylene Cracker Expansion Project**  
**Jefferson County, Texas**



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— Highway

— Major Road



**Construction Area**  
**(40 Feet X 76 Feet)**

Background Resources:  
 USGS 1 Meter DOQQ (2010)  
 Port Arthur North (NE)  
 ESRI StreetMap USA (2006)

Surveyor(s):  
 Jayme Shiner PWS

Project Number and Information:  
 1125  
 BFLP Ethylene Cracker Expansion  
 Biological Assessment

*Whitenton Group, Inc.*  
 ENVIRONMENTAL CONSULTANTS

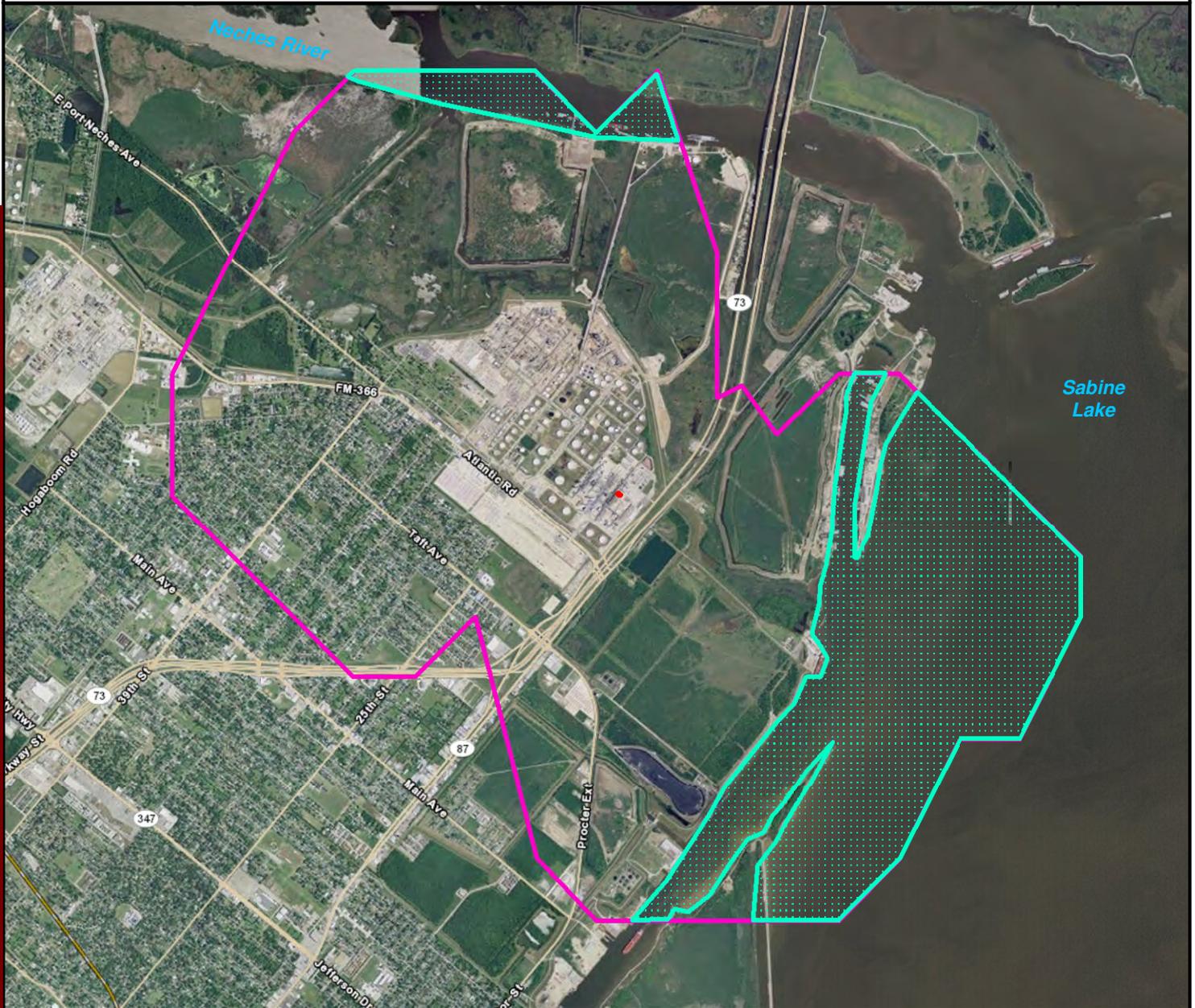
3113 Hunter Road San Marcos Texas 78666

GPS and Coordinate Type:  
 Trimble Geo XT  
 UTM NAD 1983  
 Zone 15 North

Map Created:  
 8/23/2011 by Jayme Shiner



**Figure 3**  
**Action Area - 2010 Aerial Photograph**  
**BFLP Ethylene Cracker Expansion Project**  
**Essential Fish Habitat**  
**Jefferson County, Texas**



**US EPA ARCHIVE DOCUMENT**

- Construction Area**  
(40 Feet X 76 Feet)
- Designated Essential Fish Habitat**  
Within Action Area
- Action Area Boundary**  
(Maximum Radius ~2.6 Miles)

Background Resources:  
 ESRI High-Resolution  
 Imagery Basemap  
 ESRI Transportation Basemap

Surveyor(s):  
 Jayme Shiner PWS

Project Number and Information:  
 1125  
 BFLP Ethylene Cracker Expansion  
 Biological Assessment

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GPS and Coordinate Type:  
 Trimble Geo XT  
 UTM NAD 1983  
 Zone 15 North

Map Created:  
 4/18/2012 by Jayme Shiner

