PROPOSED PLAN

FALCON REFINERY SUPERFUND SITE
ARANSAS PASS, SAN PATRICIO COUNTY, TEXAS

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 6
July 2017

INTRODUCTION

This **Proposed Plan** identifies the United States Environmental Protection Agency's (EPA) preferred remedial approach of "No Action" for the site wide ground water at **Operable Unit 1** of the Falcon Refinery Superfund Site (hereinafter, "the Falcon Site" or "the Site"). Words in **"boldface"** type in the Proposed Plan are defined in the "Glossary of Terms."

The purposes of this Proposed Plan are:

- To present the rationale for the EPA's preferred approach of No Action for the site wide ground water at the Site;
- To solicit public review and comment on the preferred approach and the information contained in the **Administrative Record**;
- To provide the history and background information about the Site; and
- To provide details and information on how the public can be involved in the remedy selection process and where the public can find more information about the Site.

EPA is the lead agency for Site activities, and the Texas Commission on Environmental Quality (TCEQ) is the support agency. The EPA, in consultation with the TCEQ, may reassess the preferred approach of "No Action" presented in this Proposed Plan or select a Remedial Action based on new information or the public's comments.

The EPA is issuing this Proposed Plan as part of its public participation responsibilities under the Comprehensive Environmental Response, Compensation, and Liability Act, as amended (CERCLA or **Superfund**), 42 U.S.C. Section 9601 et seq., and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This Proposed Plan summarizes information that can be found in greater detail in the documents contained in the **Administrative Record** file for the Site. The EPA and the State encourage the public to review these documents to gain a more comprehensive understanding of the Site and Superfund activities that have been conducted at the Site.

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Preferred Remedial Approach

The EPA's preferred remedial approach is that no action is warranted for the site wide ground water in Operable Unit 1. The results of the Remedial Investigation and Human Health Risk Assessment indicate that the site wide ground water does not pose an unacceptable current risk or potential future risk to human health. Studies of Operable Unit 1 also indicate that the presence of arsenic and manganese in the site wide ground water are in a naturally occurring unaltered form. Section 104(a)(3)(A) of CERCLA, states in pertinent part: "The President shall not provide for a removal or remedial action…in response to a release or threat of release (A) of a naturally occurring substance in its unaltered form, or altered solely through naturally occurring processes or phenomena, from a location where it is naturally found." CERCLA therefore does not provide authority for taking a remedial action to respond to a release of naturally occurring substances. Thus, a removal or remedial action for the site wide ground water at the Falcon site to respond to a release of arsenic and manganese in its naturally occurring and unaltered form is barred.

COMMUNITY INVOLVEMENT

The EPA has been actively engaged in dialogue with the affected community and has strived to advocate and strengthen early and meaningful community involvement during the removal and remedial activities at the Site. The following community participation activities will be performed during the remedy selection process to meet the public participation requirements in CERCLA and the NCP.

Public Meeting on Proposed Plan

A public meeting is scheduled for August 17, 2017, at 6:30 pm at the Aransas Pass Civic Center 700 Wheeler Avenue Aransas Pass, 78335. The EPA will hold this public meeting to present the Proposed Plan and the EPA's preliminary recommendation of "No Action" for the site wide ground water. Oral and written comments will be accepted at the meeting and during the 30-day public comment period, which will begin on July 31, 2017, and ends on August 30, 2017.

The Site's information repositories, containing the Administrative Record of the documents used to develop this Proposed Plan, are located at:

Ingleside Public Library
2775 Waco St
Ingleside, Texas 78362

Ed and Hazel Richmond Library
110 N Lamont St
Aransas Pass, Texas 78336

Texas Commission on Environmental Quality
Records Management Center

12100 Park 35 Circle,
Building E 1st Floor
Austin, TX 78753

U.S. Environmental Protection Agency
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

In addition, the EPA has posted a current fact sheet, which provides additional information about the Site, on the internet at:

www.epa.gov/superfund/Falcon-refinery

The documents comprising the Administrative Record include, among others, the **Remedial Investigation** (RI) report, **Alternatives Development Screening Memorandum** (ADSM), **Human Health Risk Assessment**, **Screening Level Ecological Risk Assessment**. The Proposed Plan highlights key information from the RI Report and ADSM.

The public is encouraged to review the documents found in the Administrative Record to gain a more comprehensive understanding of the Site, participate in the scheduled public meeting, and to review and comment on the EPA's preliminary recommendation presented in this Proposed Plan. The public's input on the preferred remedial approach for the Site and on the rationale for taking No Action is important in the EPA's remedy selection process.

Attachment 1 (Comment Sheet) can be used to provide the EPA with written comments during the public meeting and/or comment period.

SITE BACKGROUND

Site Location

The Site is an inactive petroleum refinery that is located between Farm-to-Market (FM) Road 2725 and the Intracoastal Waterway in an unincorporated area of San Patricio County, Texas (Figure 1). The property is within the extraterritorial jurisdiction (ETJ) of Aransas Pass and approximately 1 mile south of Ingleside, TX. Nearby land use includes mixed industrial/residential properties along FM 2725 and industrial companies along the Intracoastal Waterway.

The Site consists of the Former Storage Area, Former Process Area, and current barge dock facility. There are pipelines that connect the Former Process Area and Former Storage Area with the current and former barge dock facilities. The Former Storage Area consisted of nine above-ground storage tanks (AST)s, three truck loading racks, associated piping, and a transfer pump. The Former Process Area consisted of the main operations of the refinery. This area had a control room, heaters, crude towers, coalescers, boilers, firewater tank, exchangers, cooling towers, desalters, compressors, a lab, 24 ASTs, separator, clarifiers, and an aeration pond. The barge dock facility is located on the Intracoastal Waterway, which is contiguous with Redfish

Bay at this location, and was used to load and unload crude oil and refined hydrocarbons via pipelines that connect the dock to the Former Process Area and Former Storage Area.

History of the Site

Refining operations at the facility began in approximately 1980 and ceased in 1987. When in operation, the refinery had a capacity of 40,000 barrels per day, and the primary products consisted of naphtha, jet fuel, kerosene, diesel, and fuel oil. Since 1987, the refinery has operated intermittently as a bulk petroleum storage terminal, primarily storing petroleum products and crude oil.

The refinery also processed material that consisted of listed hazardous substances in addition to crude oil, from the following sources: K048 (dissolved air flotation float), K049 (slop oil emulsion solids), K050 (heat exchanger bundle cleaning sludge), and K051 (API separator sludge). Other hazardous substances at the site included vinyl acetate detected inside tanks during an EPA investigation conducted in the 1990s, chromium detected in cooling tower sludge, and untreated wastewater released inside tank berms during the 1980s.

On February 9, 2010, crude oil was found leaking from one of the ASTs (identified as Tank 13) leased by Superior Crude Gathering. Approximately 22,000 barrels of crude oil were released from the tank. The secondary containment around Tank 13 contained a portion of the crude oil, but some of the oil was carried by underground piping to other tank containment areas in the facility. An estimated 2,200 barrels of crude oil leaked into the wetland area to the east, which is located within area of concern-3 (AOC-3) (Figure 2 and page 6). All recoverable crude oil was removed from the Site prior to May 14, 2010. Soil samples were collected in May and June 2010. Surface soils at Tank 15 and Tank 26 were impacted with TPH, and surface soils at Tank 30 were impacted with benzene. The impacted soils were removed by Superior.

The current owner of the property, Lazarus Texas Refining I, LLC (LTRI), is operating the entire site as a crude oil bulk storage and transfer facility.

Community Involvement Plan

The **Community Involvement Plan** (CIP) for the site was prepared in August 2004 and was last updated in May 2017. The CIP is central to Superfund community involvement. It specifies the outreach activities that the EPA will undertake to address community concerns and expectations. The CIP includes background information about the community, community issues and concerns, community involvement activities and timing (including a communication strategy), an official contact list for the community, and local media contacts.

Technical Assistance Grant

The EPA announced the availability of a Technical Assistance Grant (TAG) for the Falcon Refinery Site on September 18, 2002. The purpose of the TAG is for a local community group to secure the services of a technical advisor to interpret Site studies and/or Site related health information for area residents.

The EPA received an application from Coastal Bend Bays Foundation, 723 N. Upper Broadway, Suite 411, Corpus Christi, TX 78401, on March 5, 2003. The EPA awarded the TAG totaling $50,000 in federal funds and $12,500 in matching funds to Coastal Bend Bays Foundation in December 2004. The TAG was closed out in December 2007.

Community Meetings

The EPA and TCEQ have conducted community meetings during the course of the Superfund activities at the Site and have provided public notices of these meetings in order to encourage the community's participation. Community meetings were held in September 2004, December 2007, May 2015, and May 2016.

Fact Sheets

Fact sheets have been and will continue to be prepared as necessary to provide the public current information about the Site.

PREVIOUS INVESTIGATIONS

Federal and state entities have conducted several studies of the Site to investigate the Site's contamination. The following efforts were conducted and/or documented prior to the EPA RI/FS investigation efforts:

- Site Inspection Report (Ecology & Environment 1987)
- Expanded Site Investigation Report Texas Natural Resource Conservation Commission [TNRCC] 2000)
- Hazard Ranking System Documentation Record (TNRCC 2002)
- Public Health Assessment (Texas Department of Health for Agency for Toxic Substances and Disease Registry [ATSDR] 2004)
- Crude Oil Spill Investigation (Pastor, Behling & Wheeler, LLC [PBW] 2010).

Potentially Responsible Parties' Involvement

The EPA has conducted enforcement activities to require the **potentially responsible parties** (PRPs) to investigate the Site's contamination and perform specific removal measures.

On September 5, 2002, the Site was proposed to the NPL. However, EPA deferred listing the Site on the NPL and identified the Site as an "alternative site" because the owner and PRP at the time, National Oil Recovery Corporation (NORCO), agreed to enter an **Administrative Order on Consent** with the EPA for a "Remedial Investigation and Feasibility Study" (RI/FS) with the EPA on June 9, 2004.

The PRP, NORCO conducted RI activities until 2010 when it informed EPA that it did not have the resources to continue the RI/FS. When NORCO ceased performing the RI/FS, the EPA determined that the PRP failed to comply with the terms and conditions of the Administrative Order on Consent for the RI/FS. On September 16, 2011, EPA decided to add the Site to the NPL and then completed the steps to continue the performance of the remedial activities required at the Site.

Removal Action

EPA and NORCO also entered into an Administrative Order on Consent for a Removal Action on June 9, 2004. Although EPA assumed the remedial work required at the Site, NORCO agreed to continue the work required by the Administrative Order on Consent for the Removal Action. In 2012, NORCO sold the Site to Lazarus Texas Refinery I, LLC (LTRI). At the time of the sale, LTRI agreed to assume the work required by the Removal Order and continues to perform the removal work under the oversight of the EPA. In April 2015, EPA named LTRI a PRP for the Site and perfected a lien on the property in August 2016.

The purpose of the Removal Action was to remove bulk materials and decontaminate deteriorating tanks, containers, structures, equipment, and piping for removal and recycling/disposal. The Administrative Order on Consent required the removal and treatment of or disposal of visually contaminated soils. These activities required portions of the facility to be dismantled to accomplish these actions and therefore, asbestos inspections were required prior to any demolition. Removal Action activities at the Site began on August 2, 2004 and are still ongoing at this time.

Hazardous liquid waste was sent for disposal at Texas Molecular Corpus Christi Services, LP (TMCCS). A total volume of 7,774,721 gallons of liquid waste was disposed of between October 2004 and July 2009. In addition, in January 2005, 403 gallons of recycled oil and filters was disposed of at TMCCS.

Bulk metal was sent to Commercial Metal Company for recycling and consisted of 1.8 million pounds removed from the site between November 2004 and January 2012.

Contaminated soil and oily debris from the site was disposed of at U.S. Ecology Texas, LP. The following was disposed of between October 2004 and January 2012:

- Petroleum contaminated soil and oily debris – 40 cubic yards (CY)
- Hazardous solid waste (oily sludge and soil) – 15 CY
- Hazardous waste-caustic tank bottoms – 57,760 pounds
- Hazardous waste-tank bottoms – 166,160 pounds.

The site originally had 32 ASTs. A total of 23 tanks were cleaned and demolished by NORCO.

In 2014, Superior Crude Gathering, operator of an oil storage facility on the site, entered into a federal Consent Decree to address a February 9, 2010 crude oil spill at the site. The Consent Decree required Superior to repair tanks, containment areas and to respond to the crude oil spills in the waterways.

After acquiring the Site in 2012, the current owner and PRP, LTRI, has cleaned and demolished two ASTs, is in the process of repairing and retrofitting two other ASTs, and is completing the other work required by the Removal Action. A total of 8 ASTs will be restored and put back into use at the completion of the Removal Action.

Remedial Investigation

NORCO, the former site owner and PRP, started work on the RI in 2004. The PRP's initial workplan called for conducting the RI/FS for the entire Site using a phased approach. Phase I was to collect initial data that would be used to design a more detailed Phase II investigation.

The PRP, NORCO, conducted the Phase I sampling in 2007 and 2008. Based on the results of Phase I investigation, the PRP started work on planning the Phase II investigation of the RI/FS. However, prior to starting Phase II, the PRP informed EPA that it would not be able to complete the RI/FS due to a lack of funding.

EPA added the Site to the NPL on September 16, 2011 after NORCO failed to comply with the terms and conditions of the Administrative Order on Consent for the RI/FS. Subsequently, the EPA began RI activities in September 2012. LTRI, the current site owner and PRP, has chosen not to conduct RI activities at the site but, under the oversight of the EPA, has agreed to continue the removal activities required by the Removal Administrative Order on Consent.

SITE CHARACTERISTICS AND REMEDIAL INVESTIGATION ACTIVITIES

The action described in this Proposed Plan addresses the shallow ground water at the Site. EPA developed a Phase II Workplan to complete the RI/FS for the entire Site and all media after taking over the RI/FS from the PRP, NORCO. EPA continued the investigation of the site wide nature and extent of the contamination through the collection of sediment, surface water, soil and ground water samples. Samples were collected on the Site, adjacent wetland areas, the Intracoastal Waterway and background areas. EPA did not collect additional samples in the Bishop Road or Thayer Road Residential Areas because the initial sampling results in those areas were below EPA screening levels.

EPA conducted an initial round of sampling in September 2013 to collect soil, surface water, sediment, and ground water samples. EPA reviewed the data collected and decided to collect additional surface water and ground water samples in October 2014. EPA collected additional ground water samples in 2016 to further characterize the ground water at the site. Studies indicate that only the up-gradient area of the ground water at the Site is usable for human consumption. In the up-gradient portion of the Site, arsenic concentrations are equivalent to concentrations found in ground water not impacted by the Site.

Potential Source Areas

The Former Process, Former Storage, and Loading areas have been identified as potential source areas. Source material processed during refinery operations included crude oil, slop oil emulsion solids, heat exchanger bundle cleaning sludge, separator sludge, and cooling tower sludge. Periodic releases of crude oil and sludge had occurred during operations which impacted surface soil, and untreated wastewater was discharged into unlined containment ponds. Leaks and spills impacted surface soils in the Former Storage, Process, and Loading Areas. Leaks and spills from the Former Process Area and Former Storage Area impacted the roadside ditches adjacent to the Site along Bishop Road and Thayer Road.

Scope and Role of Operable Units

"**Operable Unit**" (OU) means a discrete action that comprises an incremental step toward comprehensively addressing problems at a site. The cleanup of a site can be divided into a number of OUs, depending on the complexity of the problems associated with a site. OUs may address geographical portions of a site, site-specific problems, or initial phases of an action. OUs may consist of any set of actions performed over time or any actions that are concurrent but located in different parts of a site. OUs will not impede implementation of subsequent actions, including a final action at a site.

The EPA has organized the Site into three OUs (Figure 3), OU 1 (Site Wide Ground Water), OU 2 (Wetlands and Marine Habitats), and OU 3 (Soils) as discrete actions that address the distinct geographical portions and the different media affected by the Site.

During the course of the investigation, EPA decided to divide the Site into the following OUs:

Operable Unit 01 Site Wide Ground Water

- Shallow Chicot Aquifer

Operable Unit 02 Wetlands and Marine Habitat

- Intracoastal Waterway adjacent to the barge dock
  - Sediments
  - Surface Water

- Wetland Area
  - Soils
  - Surface Water
  - Sediment

Operable Unit 03 Soils

- Former Storage Area
- Former Process Area

- Undeveloped Refinery Property
- Barge Dock
- Bishop Road and Thayer Road Residential Areas

This proposed plan will only address EPA's preferred remedial approach for OU 1 (Site Wide Ground Water). EPA will prepare separate decision documents to address OU 2 (Wetlands and Marine Habitats) and OU 3 (Soils).

Soil Investigation (OU 3)

The PRP, LTRI, is currently completing the items required by the Removal AOC. EPA will review the data that it has collected and any additional data collected in making a remedial decision to address the soils at the site not addressed by OU 2.

Soil, Sediment and Surface Water Investigation (OU 2)

Based on the initial sampling results, EPA decided to create OU 2 (Wetlands and Marine Habitat) to address the soils, surface waters and sediments in the wetland area and Intracoastal Canal. EPA is in the process of collecting additional samples and will issue a separate decision document to address OU 2.

Ground Water Investigation (OU 1)

The uppermost water-bearing unit at the Site was evaluated as part of the Site ground water investigation. The water-bearing unit of interest during this investigation includes the Beaumont Formation, which is part of the Chicot Aquifer. The Chicot Aquifer is considered a major aquifer in Texas. The geologic units are discussed in further detail in the RI report. The shallow ground water of concern is potentially confined by a clay layer located at approximately 20 feet below ground surface, based on the interpretation of drillers logs from water wells installed in the area. The shallow ground water at the site is located approximately two to five feet below ground surface and flows primarily to the east-southeast towards the Intracoastal Waterway.

Ground water in the vicinity of the site is not currently used as drinking water. Potable water is supplied to area residents and businesses from an approved surface water source. Since 1999, the City of Aransas Pass has supplied potable water from the Nueces River to the residents and businesses surrounding the site. The raw water intakes for the water supply system are located approximately 30 miles west of the Falcon Refinery site. The nearest residential population is northwest of the Falcon Refinery site on Bishop Road. The residential water wells on Bishop Road vary from approximately 45 to 65 feet in the deep water bearing unit below the clay layer beneath the shallow ground water. Residents were contacted by the Texas Department of Health in 2004 as part of the Public Health Assessment of the Site. All residents contacted, with one exception, currently use their water wells for landscaping purposes only. One family uses its well for household cleaning purposes, not for food preparation or ingestion. The TCEQ maintains a database of water wells, a review of the database in 2016 found that the only wells completed into the shallow ground water, 20 feet or less, near the site were for monitoring purposes only.

The PRP, NORCO, initially installed temporary monitor wells site wide as part of the Phase I investigation in 2007 and 2008. Data collected from the temporary wells was used to determine the number and location of permanent monitor wells installed in Phase II of the RI. After taking over the RI activities from the PRP in 2012, EPA installed and developed 16 permanent monitor wells on the Site (Figure 4) and 10 temporary monitor wells. EPA sampled all of the wells in September 2013 and removed the 10 temporary wells after sampling was completed. EPA collected additional ground water samples from the 16 permanent wells in 2014 and 2016. Ground water samples were collected from monitoring wells generally screened from 3 to 13 feet below ground surface.

The shallow ground water was found to contain volatile organic chemicals (VOCs) and metals. The concentrations were compared to Regional Screening Levels (RSLs) for ground water. The RSL evaluation criteria were compiled from a number of sources such as the EPA's Region 6 Media-Specific Screening Levels, TCEQ's Protective Concentration Levels (PCLs), surface water quality standards, and Maximum Contaminant Levels (MCLs). The actual screening value used in determining whether to perform additional sampling was the lowest, or more conservative, of these values. There were no exceedances of the RSLs in the Residential Property Areas adjacent to the Site.

The following VOCs were found to be present in the ground water above the ground water RSLs: benzene, ethylbenzene, methyl tertiary butyl ether (MTBE), 2-methylnaphthalene, and naphthalene. A review of the data shows that the concentrations of VOCs have decreased since 2007. The samples that EPA collected in 2016, documented in Table 1, indicate that all the VOCs are either below their MCL (benzene and ethylbenzene) or PCL (MTBE, 2-methylnaphthalene, and naphthalene) and that further screening of VOCs is not warranted.

Table 1
2016 Ground Water Sample Results vs (MCL/PCL)
Volatile Organic Chemicals

	Benzene		Ethylbenzene		MTBE		Naphthalene		2-methyl-naphthalene	
Monitor Well	2016 (µg/L)	MCL (µg/L)	2016 (µg/L)	MCL (µg/L)	2016 (µg/L)	PCL (µg/L)	2016 (µg/L)	PCL (µg/L)	2016 (µg/L)	PCL (µg/L)
MW 1	ND	5	ND	700	ND	240	0.47	490	ND	98
MW 2	0.5	5	0.7	700	56.1	240	2.6	490	5.5	98
MW 3	ND	5	1	700	2.7	240	7.8	490	26	98
MW 4	ND	5	ND	700	ND	240	ND	490	ND	98
MW 5	ND	5	ND	700	8.3	240	ND	490	ND	98
MW 6	ND	5	ND	700	1.5	240	ND	490	ND	98
MW 7	ND	5	ND	700	ND	240	ND	490	ND	98
MW 8	ND	5	ND	700	21.8	240	ND	490	ND	98
MW 9	ND	5	ND	700	17	240	ND	490	ND	98
MW 10	ND	5	ND	700	6.9	240	ND	490	ND	98
MW 11	ND	5	ND	700	19.3	240	ND	490	ND	98

MW 12	ND	5	ND	700	ND	240	ND	490	ND	98
MW 13	ND	5	ND	700	ND	240	ND	490	ND	98
MW 15	ND	5	ND	700	ND	240	ND	490	ND	98
MW 16	ND	5	ND	700	ND	240	ND	490	ND	98
MW 17	ND	5	ND	700	ND	240	ND	490	ND	98

ND=Not Detected

The following metals are present in the Site ground water above the ground water RSLs: manganese (dissolved), hexavalent chromium (dissolved), and arsenic (dissolved). Arsenic exceeded RSLs throughout the Site, manganese exceeded the RSLs in the Former Process Area and adjacent undeveloped refinery land, hexavalent chromium exceeded RSLs in the Former Process Area. Arsenic exceeded its MCL of 10 µg/L and manganese exceeded its PCL 1100 µg/L. The 2013 and 2014 total chromium sample results were below the 2007 and 2008 results for hexavalent chromium and in 2016 total chromium was not detected in the ground water. There were no chromium samples (hexavalent or total) that exceeded the total chromium MCL of 100 µg/L. Therefore, further screening of chromium is not warranted.

Table 2 shows the maximum sample results for dissolved arsenic and dissolved manganese and corresponding MCL/PCL.

Table 2
Screening Results
Dissolved Arsenic and Dissolved Manganese vs (MCL/PCL)
(µg/L)

	Site	Monitor	Screening	
	Maximum	Well	Value	MCL/PCL
Parameter	(µg/L)	Location	(µg/L)	(µg/L)
Arsenic	104	MW-12	10	MCL
Manganese	2520	MW-11	1100	PCL

Ground Water Background Area

Background samples were collected from temporary monitoring wells installed to the southwest of the site. The temporary well screens were 5 feet in length and were completed to depths ranging from 7.5 to 13 feet below ground surface based upon where the shallow ground water was encountered. Ground water from the monitoring wells and the temporary wells were sampled at similar depths, and were collected from the same ground water interval. Dissolved arsenic concentrations in the background wells ranged from 1.4 µg/L to 16.1 µg/L 76 µg/L to 453 µg/L for dissolved manganese. The geochemistry of the background ground water was also investigated. Some of the geochemical parameters that were measured by EPA were oxidation-reduction potential (ORP), dissolved sodium, and dissolved iron. Table 3 provides results of the background ground water and soils.

Table 3
Background Ground Water and Soil Results
Metals and ORP Data

	Sodium		Iron		Arsenic		Manganese		ORP
Monitor Well	(mg/l)	(mg/kg)	(mg/l)	(mg/kg)	(µg/l)	(mg/kg)	(mg/l)	(mg/kg)	(mV)
2013									
TWB-1	179	BDL	1.59	3030	1.4	4.6	0.17	64	-64
TWB-2	233	BDL	0.1	721	2.9	0.66	0.106	5.2	27
TWB-3	102	BDL	4.5	474	2.6	0.97	0.095	7.2	-40
TWB-4	242	BDL	17	192	4	1.3	0.119	2.5	-46
TWB-5	341	BDL	12.3	640	4.5	0.94	0.208	10.3	-77
TWB-6	80	BDL	1.18	130	3	1.3	0.453	3.9	-111
TWB-7	102	BDL	4.27	534	2.3	0.52	0.152	12.4	-81
TWB-8	95	BDL	13.1	224	8.6	0.42	0.115	7.5	-43
TWB-9	46	BDL	8.25	181	15.7	0.4	0.131	2.1	-23
TWB-10	60	BDL	6.16	1720	7.6	1.3	0.077	36.6	-35
2008									
TWBG-1	50	49	1.98	330	3.6	BDL	0.04	3.8	NS
TWBG-2	711	BDL	4.37	691	8.3	0.29	1.07	12.1	NS
TWBG-4	172	1260	0.79	2340	5	2.8	0.331	83	NS
BDL Below Detection Limit									

Ground Water Geochemistry and Classification

The geochemistry of the shallow ground water was investigated by EPA as part of the RI and ADSM. Some of the geochemical parameters that were measured by EPA were oxidation-reduction potential (ORP), total dissolved solids (TDS), dissolved sodium, and dissolved iron.

EPA sampled TDS in 2014 and 2016, TDS concentrations at the Site range from 261 to 60,900 milligrams per liter (mg/L). Ground water with TDS concentrations exceeding 10,000 mg/L is considered as non-potable by EPA and Class 3 ground water by the TCEQ (i.e., ground water not considered useable as drinking water). The TDS concentrations exceeded 10,000 mg/L at the following monitor well locations: MW-12, MW-13, MW-16, and MW-17 (located in the Former Process Area, Undeveloped Refinery Land, Wetland Area, and Barge Dock). The TDS from monitoring wells in MW-1 through MW-11 and MW-15 is less than 10,000 mg/L (located in the Former Process Area, Former Storage Area, and Wetland Area) and is considered as a potential source of drinking water by EPA and Class 2 ground water (potentially usable drinking water supply) by TCEQ. Figure 5 shows the current Class 2 and Class 3 ground water areas. TDS data was not collected in 2013, however, dissolved sodium data was collected during each sampling event. The data collected indicates dissolved sodium is the primary source of TDS in the shallow ground water is naturally occurring and not related to past Site activities. Table 4 gives the TDS and sodium results.

Table 4
Site Wide Ground Water
Sodium and TDS Results

Class 2 Monitor Well Data TDS< 10,000 mg/L

	Sodium (mg/l)			TDS (mg/l)	
Monitor Well					
	2013	2014	2016	2014	2016
MW 1	31	38	14	261	270
MW 2	22	21	30	333	1500
MW 3	28	26	26	277	472
MW 4	54	105	28	460	500
MW 5	66	58	20	513	388
MW 6	70	40	63	533	630
MW 7	68	21	54	322	580
MW 8	251	237	203	1850	2050
MW 9	229	218	194	1440	1475
MW 10	4060	3030	2140	8380	9770
MW 11	2540	2060	1680	5720	7470
MW 15	281	308	136	1240	740
Class 3 Monitor Well Data TDS> 10,000 mg/L					
MW 12	21,900	24,100	15,800	60,900	64,770
MW 13	4330	4460	3380	14,000	16,012
MW 16	9830	8160	4460	14,700	16,700
MW 17	1470	3610	2740	10,200	10,150

High concentrations TDS are present in the Class 3 wells (MW-12, MW-13, MW-16, and MW-17). High salinity and sodium (components of TDS) can affect ion exchange and increase arsenic and manganese concentrations in ground water. This indicates that the arsenic and manganese concentrations are being driven by naturally occurring phenomenon and not because of current or past Site operations.

The ORP data indicates that in the Class 2 portion of the Site and the background area that ground water is in a reducing condition. ORP ranged from -184 millivolt (mV) to 105 mV in the shallow ground water. Under reducing conditions, arsenic and manganese are likely to be released from their absorbed form on iron oxides, causing their concentrations to increase in the ground water. The data collected by EPA indicates that elevated levels of arsenic and manganese corresponded to elevated levels of iron and low levels of ORP. It is observed that biological degradation of hydrocarbons can create reducing conditions in ground water which can lead to the mobilization of arsenic and other metals. A review of soil and ground water samples collected during the RI and the samples collected by Superior Crude as part of their response to the 2010 oil spill at the site indicate that site wide hydrocarbons are at very low levels. EPA notes that the background values of ORP and iron (Table 3) are elevated indicating that the arsenic and manganese concentrations are being driven by naturally occurring phenomenon and

are not due to Site operations. Table 5 gives a summary of the Class 2 ground water geochemistry.

TABLE 5. CLASS 2 GROUND WATER GEOCHEMISTRY RESULTS

Sample Location Well ID	Sample Date	Arsenic (µg/L)	Manganese (µg/L)	Iron (µg/L)	ORP (mV)
MW-01	17-Sep-13	3.60	244	605	-87.40
	6-Oct-14	2.46	102	619	-26.80
	6-Oct-16	ND	124	150	-103.90
MW-02	17-Sep-13	3.20	287	1220	-110.10
	6-Oct-14	3.04	280	3200	45.50
	5-Oct-14	ND	289	4190	-125.90
MW-03	17-Sep-13	7.60	195	1010	-105.90
	7-Oct-14	5.87	148	2410	-94.60
	6-Oct-16	12.90	194	2560	-131.20
MW-04	17-Sep-13	1.40	121	191	-19.90
	6-Oct-14	3.13	26	955	55.20
	6-Oct-16	ND	361	189	-33.10
MW-05	18-Sep-13	8.60	151	947	-146.20
	7-Oct-14	1.98	439	1290	-14.10
	6-Oct-16	ND	176	2500	-138.10
MW-06	18-Sep-13	5.30	239	2410	-130.00
	7-Oct-14	1.19	241	5640	-87.90
	4-Oct-16	11.40	257	2560	-80.60
MW-07	18-Sep-13	8.30	360	174	32.90
	8-Oct-14	3.88	726	274	89.50
	3-Oct-16	5.30	253	2510	-57.10
MW-08	18-Sep-13	3.90	520	651	-52.00
	7-Oct-14	5.42	489	1410	32.00
	4-Oct-16	8.30	355	159	1.20
MW-09	18-Sep-13	6.00	458	911	-52.50
	8-Oct-14	35.70	392	3190	-43.00
	3-Oct-16	3.00	373	102	-76.30

MW-10	18-Sep-13	BDL	2040	1190	-42.60
	9-Oct-14	BDL	1920	2010	-45.70
	4-Oct-16	31.10	1600	2690	-62.90
MW-11	18-Sep-13	54.20	2520	6890	-184.40
	9-Oct-14	5.93	1510	510	-136.90
	4-Oct-16	28.40	2180	266	-152.10
MW-15	18-Sep-13	21.8	54	ND	57.40
	8-Oct-14	16.4	114	125	105.20
	5-Oct-16	5.9	114	419	-92.90

NOTES:
mg/L = Milligrams per liter.
µg/L = Micrograms per liter
NS = Not Sampled.
ND = Not Detected, Detection limit below MCL/PCL
BDL = Below Detection limit; Detection limit is above MCL/PCL

In the Class 3 wells aquifer TDS plays a dominant role in dissolved arsenic and manganese levels; and redox condition becomes less influential compared to that at Class 2 wells. The RI Report provides detailed ground water data.

CURRENT AND POTENTIAL FUTURE LAND USE

The likely future land use for the Site is likely to remain similar to current conditions (Industrial Use for the Former Storage Area, Former Process Area, Undeveloped Refinery Land, and Barge Dock), Recreational Use (Wetlands and Marine Habitats), and (Residential for the areas adjacent to residential properties).

CURRENT AND POTENTIAL GROUND WATER USE

Currently the shallow ground water beneath the Site is not being used for residential, industrial, commercial, or agricultural use. EPA does not expect the shallow ground water to be used in the future.

HUMAN HEALTH RISK ASSESSMENT AND SUMMARY OF SITE RISK

A **Human Health Risk Assessment** (HHRA) is an integral part of the RI process. A HHRA estimates the current and possible future risks if no action were taken to clean up a site, or baseline risk. The EPA's Superfund risk assessors determine how threatening a hazardous waste site is to human health and the environment. They seek to determine a protective level for each potentially dangerous contaminant present (*i.e.,* a level at which ill health effects are unlikely and the probability of cancer is very small). Living near a Superfund site does not automatically

place a person at risk, that depends on the chemicals present and the ways people are exposed to them.

EPA performed separate HHRAs for the barge dock and Intracoastal Waterway to determine if contaminants were present above health based levels. As a result, three HHRAs were performed at the Site prior to EPA deciding to divide the site into OU 1, OU 2, and OU 3. The following provides a compiled summary from the HHRAs as they relate to OU 1.

The HHRA used data collected during the RI and industrial/commercial land use assumptions to evaluate the completeness and potential significance of potential human health exposure pathways identified in Conceptual Site Models (CSMs) for Site wide ground water.

Chemicals of Potential Concern

Chemical of Potential Concern (COPC)s are chemicals that pose an elevated carcinogenic risk, have an elevated toxicity risk, or are found in Site ground water at concentrations that exceed MCLs.

The following constituents are considered to be ground water COPCs at the Site:

- Arsenic
- Manganese

Human Health Risk Considerations

The previous HHRAs evaluated ground water at the site without consideration of its usability. As previously stated, a portion of the ground water beneath the site is classified as unusable (Class 3) due to its high salinity. The COPCs (arsenic and manganese) have been further evaluated for the potentially usable ground water (Class 2) as part of the ADSM.

Updated exposure point concentrations for arsenic and manganese were calculated separately in the ADSM for the Class 2 and Class 3 ground water at the site. The data points used for the Class 2 and Class 3 locations were determined based upon the TDS results.

The calculated exposure point concentration for dissolved arsenic in Class 2 ground water is 10.1 µg/L, which is less than the background and is comparable to the MCL of 10 µg/L. The calculated exposure point is below the background dissolved arsenic USL of 15 µg/L. This indicates the exposure to arsenic in the Class 2 ground water at the site would be similar to background conditions. EPA policy does not support remediation of metals below background concentrations or the MCL. In addition, the presence of arsenic in the Class 2 portion of the ground water appears to be attributable to the site geochemistry (reducing conditions), as noted earlier and is not associated with historical site operations.

The calculated exposure point concentration for dissolved arsenic in Class 3 ground water is 38.8 µg/L, which exceeds the background USL. However, the ground water is not usable due to the

high TDS content. Restoration of the Class 3 ground water to drinking water standards is not warranted.

The calculated exposure point concentration for dissolved manganese in Class 2 ground water is 579 µg/L, which is approximately 1.5 times the background USL of 366 µg/L and is less than the PCL of 1100 µg/L and therefore no response under CERCLA is required to address dissolved manganese in the site wide ground water. The presence of manganese in ground water is most likely attributable to the site geochemistry, as noted earlier and is not associated with historical site operations.

The calculated exposure point concentration for dissolved manganese in Class 3 ground water is 1,880 µg/L, which exceeds the background UPL. However, the ground water is not usable due to the high TDS content. Restoration of the Class 3 ground water to drinking water standards is not warranted. The presence of manganese in ground water is attributed to the site geochemistry, as noted earlier and is not associated with historical site operations.

Conclusions of the Human Health Risk Assessments

Based on the Site risks evaluated in the HHRA and ADSM, it is the lead agency's current judgment that the Preferred Alternative of "No Action" identified in this Proposed Plan, is protective of public health or welfare for exposure to ground water.

ECOLOGICAL RISK ASSESSMENT

An **Ecological Risk Assessment** (ERA) is also an integral part of the RI process. A ERA is defined as a process that evaluates the likelihood that adverse ecological effects are occurring or may occur as a result of exposure to material(s) that impose a change in an ecological system.

In order to determine environmental impacts, Screening Level Ecological Risk Assessments (SLERAs) were conducted. Based on the results of the SLERA there are no COPCs in OU 1 which should be considered for future remedial action based on exposure to ecological receptors. It is the lead agency's current judgment that the Preferred Alternative of "No Action" identified in this Proposed Plan, is protective of the environment.

EPA will address ecological risks for OU 2 (Wetlands and Marine Habitats) and OU 3 (Soils) in future decision documents.

REMEDIAL ACTION OBJECTIVES

No Remedial Action Objectives (RAOs) for the Site have been identified because EPA's preferred remedial approach is "No Action" for OU 1 based on the finding that arsenic and manganese in the ground water is in a naturally occurring, unaltered form. Section 104(a)(3)(A) of CERCLA, states in pertinent part: "The President shall not provide for a removal or remedial action…in response to a release or threat of release (A) of a naturally occurring substance in its unaltered form, or altered solely through naturally occurring processes or phenomena, from a location where it is naturally found." CERCLA therefore does not provide authority for taking a

remedial action to respond to a release of naturally occurring substances. Thus, a removal or remedial action for the site wide ground water at the Falcon site to respond to a release of arsenic and manganese in its naturally occurring and unaltered form is barred.

Community Acceptance

The community's acceptance of EPA's preliminary recommendation will be evaluated after the public comment period ends on August 30, 2017. The EPA, in consultation with the TCEQ, will issue the **Record of Decision** for the Site, which identifies the Selected Remedy, after reviewing and evaluating all comments submitted during the Proposed Plan public meeting and the 30-day public comment period. The EPA will respond to all significant comments in a **Responsiveness Summary** which will be included in the Record of Decision for the Site. The Record of Decision is expected to be issued in a short time frame after the close of the public comment period. The EPA's preliminary recommendation of "no action" can change in response to public comment or new information.

SUMMARY

Based on information currently available, the EPA believes that the preferred remedial approach presented in this Proposed Plan of "No Action" for Site wide ground water in OU 1 is appropriate. Studies indicate that only the up-gradient area of the ground water at the Site is usable for human consumption. In the up-gradient portion of the Site, arsenic concentrations are equivalent to concentrations found in ground water not impacted by the Site. In addition, the geochemistry of the site indicates that arsenic and manganese are naturally occurring in an unaltered form in the ground water. EPA is prohibited by CERCLA from taking a remedial action to address contaminants naturally occurring in an unaltered form.

State Acceptance

The TCEQ has been provided the opportunity to review the RI Report, the ADSM and the Proposed Plan. TCEQ's acceptance of the Preliminary Recommendation of "No Action" will be evaluated during the public comment period.

CONTACTS FOR MORE INFORMATION

Please contact the EPA's representatives for any questions you may have concerning the EPA's preliminary recommendation of "no action" for OU 1, the meeting to discuss the Proposed Plan, or any other information concerning the Site. The EPA's representatives are:

Brian W. Mueller
(Remedial Project Manager)
Telephone: 214-665-7167*
E-Mail Address: mueller.brian@epa.gov

Jason McKinney
(Public Liaison)

Telephone: 214-665-8132*
E-Mail Address: mckinney.jason@epa.gov

*EPA's Superfund Toll-Free #:
1-800-533-3508

GLOSSARY OF TERMS

Administrative Record (AR) – All documents which the EPA considers or relies upon in selecting the response action at a Superfund site, culminating in the Record of Decision for a Remedial Action or an Action Memorandum for a Removal Action.

Alternative Development Screening Memorandum (ADSM) – The mechanism for the development and evaluation of alternative remedial actions.

Ecological Risk Assessment (ERA) – A process that evaluates the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to one or more chemical, physical, or biological stressors.

Extent Evaluation Screening Criteria or Values (Screening Values) – Screening levels that were used to determine the extent of contamination. If soil or ground water concentrations, at the perimeter of the area being investigated, exceeded the screening values, additional samples were taken over an expanded area. These screening levels were compiled from a number of sources such as the EPA's Region 6 Media-Specific Screening Levels, TCEQ's Protective Concentration Levels, surface water quality standards, and Maximum Contaminant Levels. The actual screening value used in determining whether to perform additional sampling was the lowest, or more conservative, of these values.

Feasibility Study (FS) – The mechanism for the development, screening, and detailed evaluation of alternative remedial actions.

Ground water – Water found beneath the surface of the ground that fills pores between soil, sand, and gravel particles to the point of saturation. Ground water can be used as a water supply when it occurs in sufficient quantity and quality.

Human Health Risk Assessment (HHRA) – A process to estimate the nature and probability of adverse health effects in humans who may be exposed to chemicals in contaminated environmental media, now or in the future. This risk assessment estimates the current and possible future risks if no action were taken to clean up a site. The EPA's Superfund risk assessors determine how threatening a hazardous waste site is to human health and the environment. They seek to determine a safe level for each potentially dangerous contaminant present (*e.g.,* a level at which ill health effects are unlikely and the probability of cancer is very small). Living near a Superfund site doesn't automatically place a person at risk, that depends on the chemicals present and the ways people are exposed to them. A human health risk assessment addresses questions such as:

- What types of health problems may be caused by environmental stressors such as chemicals?

- What is the chance that people will experience health problems when exposed to different levels of environmental stressors?
- Is there a level below which some chemicals don't pose a human health risk?
- What environmental stressors are people exposed to and at what levels and for how long?
- Are some people more likely to be susceptible to environmental stressors because of factors such as age, etc.?
- Are some people more likely to be exposed to environmental stressors because of factors such as where they play, etc.?

Light Non-Aqueous Phase Liquids (LNAPL) – A non-aqueous phase liquid with a specific gravity less than 1.0. Because the specific gravity of water is 1.0, most LNAPLs float on top of the water table. Most common petroleum hydrocarbon fuels and lubricating oils are LNAPLs.

Milligram/Kilogram (mg/kg) – Units of measure used to express the concentrations of metals (*e.g.,* lead) or organics in soil or sediments. For example, one mg/kg of lead in soil would be equivalent to one cent in $10,000.

National Priorities List (NPL) – The EPA's list, compiled pursuant to statutory authority, of uncontrolled hazardous substance releases in the United States that are priorities for long-term evaluation and response. The NPL is based primarily on the score a site receives from the Hazard Ranking System. The EPA updates the NPL at least once a year.

Operable Unit (OU) – A discrete action that comprises an incremental step toward comprehensively addressing problems at a site. The cleanup of a site can be divided into a number of OUs, depending on the complexity of the problems associated with a site. OUs may address geographical portions of a site, site-specific problems, or initial phases of an action. OUs may consist of any set of actions performed over time or any actions that are concurrent but located in different parts of a site.

Potentially Responsible Parties (PRPs) – Individuals or companies (such as owners, operators, transporters, or generators of hazardous waste) that are potentially responsible for, or contributing to, the contamination problems at a Superfund site. Whenever possible, the EPA requires PRPs, through administrative and legal actions, to clean up hazardous waste sites they have contaminated.

Proposed Plan – A decision document that presents the EPA's rationale for the Preferred Alternative selection of a remedial action. The Proposed Plan solicits public review and comment on the proposed action and the information contained in the Administrative Record for a site. It also provides the history and background information about a Site and describes where more information can be found.

Record of Decision (ROD) – The final Remedial Action plan for a site. The purpose of the ROD is to document the remedy selected, provide a rationale for the selected remedy, and establish performance standards or goals for the site or the operable unit under consideration. The ROD provides a plan for site design and remediation, and documents the extent of human health or environmental risks posed by the site or operable unit. It also serves as legal

certification that the remedy was selected in accordance with the requirements of the Superfund statute and regulations. The ROD is one of the most important documents in the remedy selection process because it documents all activities prior to the selection of a remedy and provides a conceptual plan for activities subsequent to the ROD.

Remedial Investigation (RI) – The step in the Superfund cleanup process that is conducted to gather sufficient information to support the selection of a site remedy that will reduce or eliminate the risks associated with contamination at the site. The RI involves site characterization which is the collection of data and information necessary to characterize the nature and extent of contamination at the site. The RI also determines whether the contamination presents a significant risk to human health or the environment.

Removal Action – An action based on the type of situation, the urgency and threat of the release or potential release, and the subsequent time frame in which the action must be initiated.

Responsiveness Summary – A summary of oral and/or written public comments received by the EPA during a public comment period on key EPA documents, such as a Proposed Plan, and the EPA's response to those comments. A responsiveness summary is included in the Record of Decision for a site.

Superfund – The program operated under the legislative authority of the "Comprehensive Environmental Response, Compensation, and Liability Act" that funds and carries out EPA solid waste emergency and long-term removal and remedial activities. These activities include establishing the National Priorities List, investigating sites for inclusion on the list, determining their priority, and conducting and/or supervising cleanup and other remedial actions.

Uncertainty – Is the lack of knowledge about specific variables, parameters, models, or other factors and is a component of risk resulting from imperfect knowledge of the degree of hazard or of its spatial and temporal distribution. For example, we can be very certain that different people drink different amounts of water, but we may be uncertain about how much variability there is in water intakes among the population. Another example includes limited data regarding the concentration of a contaminant in an environmental medium.

Volatile Organic Compound (VOC) – Any organic compound that participates in atmospheric photochemical reactions except those designated by EPA as having negligible photochemical reactivity.

CONCURRENCES

PROPOSED PLAN
FALCON REFINERY SUPERFUND SITE
ARANSAS PASS, SAN PATRICIO COUNTY, TEXAS
JULY 2017

Brian Mueller
Remedial Project Manager

7/18/17
Date

Carlos Sanchez
Chief, Arkansas/Texas Section

7/18/17
Date

John C. Meyer
Chief, Superfund Remedial Branch

7/18/17
Date

Gloria Moran
Attorney, Office of Regional Counsel

7/20/17
Date

Mark A. Peycke
Chief, Superfund Branch, Office of Regional Counsel

07/21/17
Date

Pamela Phillips
Deputy Director, Superfund Division

7/31/17
Date

ATTACHMENT 1
COMMENT SHEET

Your comments on the Proposed Plan for Operable Unit 1 (OU 1, Site Wide Ground water) for the Falcon Refinery Superfund Site (hereinafter "Falcon Refinery" or "the Site") are important to the EPA and the TCEQ and will help us evaluate the EPA's preliminary recommendation of "no action" for the Site's OU 1. You may use the space below to write your comments. Used additional sheets if necessary sheets if necessary. Please mail your comments to the EPA's Remedial Project Manager:

Brian W. Mueller
U.S. Environmental Protection Agency
Superfund Division (6SF-RL)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

must be postmarked on or before **August 30, 2017**, the end of the 30-day public comment period. You may also provide oral or written comments during the public meeting scheduled for July 20, 2017 at 6:30 pm at the Aransas Pass Civic Center 700 Wheeler Avenue Aransas Pass, Texas. Those individuals with computer communications capabilities may submit their comments to the EPA's Remedial Project Manager via the internet at: mueller.brian@epa.gov. The EPA will respond to all significant comments in a "Responsiveness Summary" that will be included with the Record of Decision which identifies the Selected Remedy for the Site. If you have any questions about the comment period or the Falcon Refinery Site, please contact Brian W. Mueller at (214) 665-7167 or the EPA's toll-free number at 1-800-533-3508.

Name:_____ Mailing Address:_____

City:_____ State:_____ Zip Code:_____

Telephone #:_____ E-Mail Address: _____

FIGURES

N

0 1,500 3,000

Feet

1 inch = 2,000 feet

Legend

Areas of Concern Boundary

Falcon Refinery Superfund Site
Ingleside, San Patricio County, Texas

Figure 1
Site Location Map
Proposed Plan for Operable Unit 1

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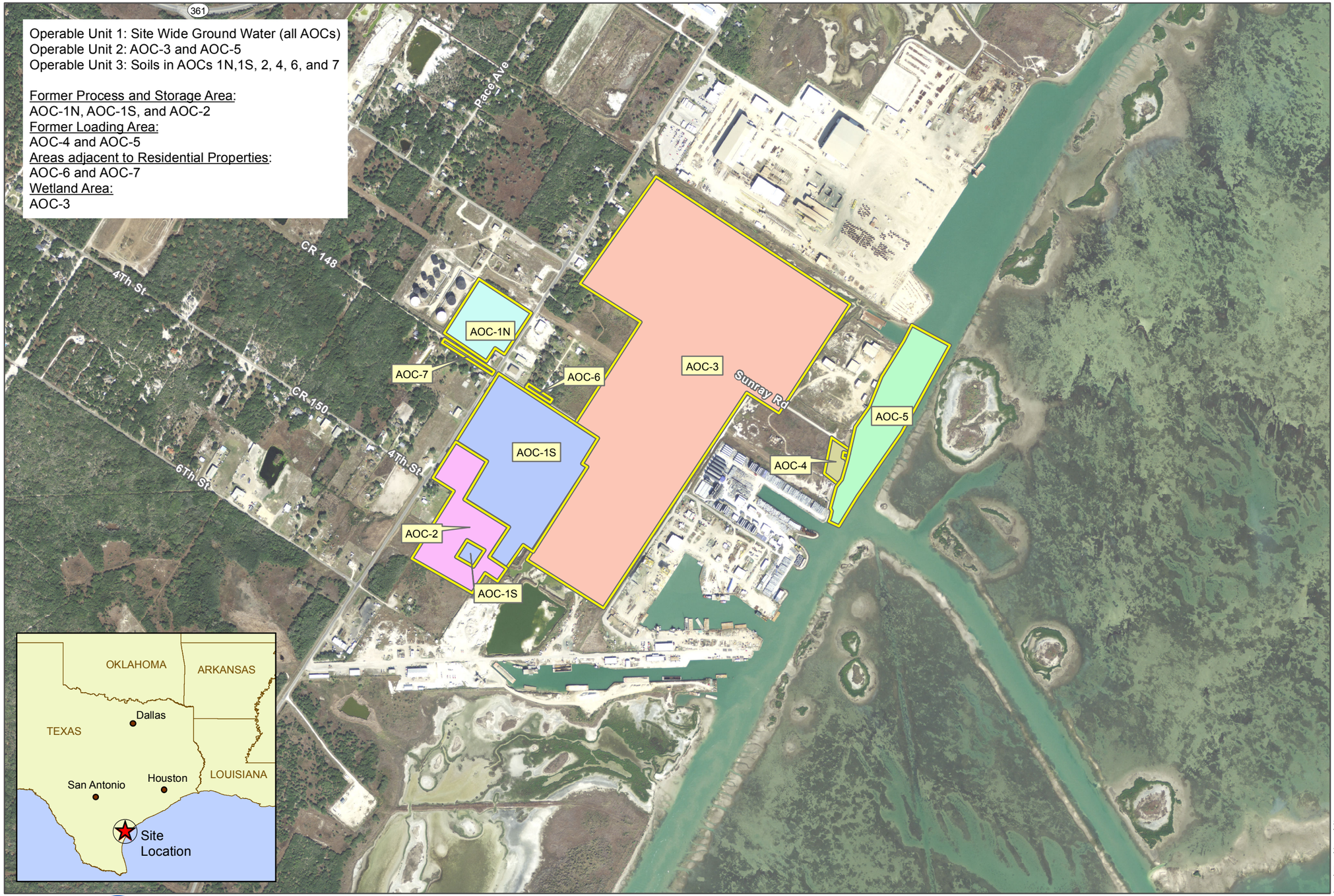
033970

Operable Unit 1: Site Wide Ground Water (all AOCs)
Operable Unit 2: AOC-3 and AOC-5
Operable Unit 3: Soils in AOCs 1N,1S, 2, 4, 6, and 7

Former Process and Storage Area:
AOC-1N, AOC-1S, and AOC-2
Former Loading Area:
AOC-4 and AOC-5
Areas adjacent to Residential Properties:
AOC-6 and AOC-7
Wetland Area:
AOC-3



N

0 750 1,500

Feet

1 inch = 1,000 feet

Legend:

Label

- AOC-1N
- AOC-1S
- AOC-2
- AOC-3
- AOC-4
- AOC-5
- AOC-6
- AOC-7

Source: AOC and Pipeline Source: TRC, dated, March 10, 2011

2007/2008 Sample Source:

Image Source: 2009 Texas Orthoimagery Program, Texas Strategic Mapping Program, TNRIS, 2009

Falcon Refinery Superfund Site
Ingleside, San Patricio County,Texas

Figure 2
Site Layout Map
Proposed Plan for Operable Unit 1

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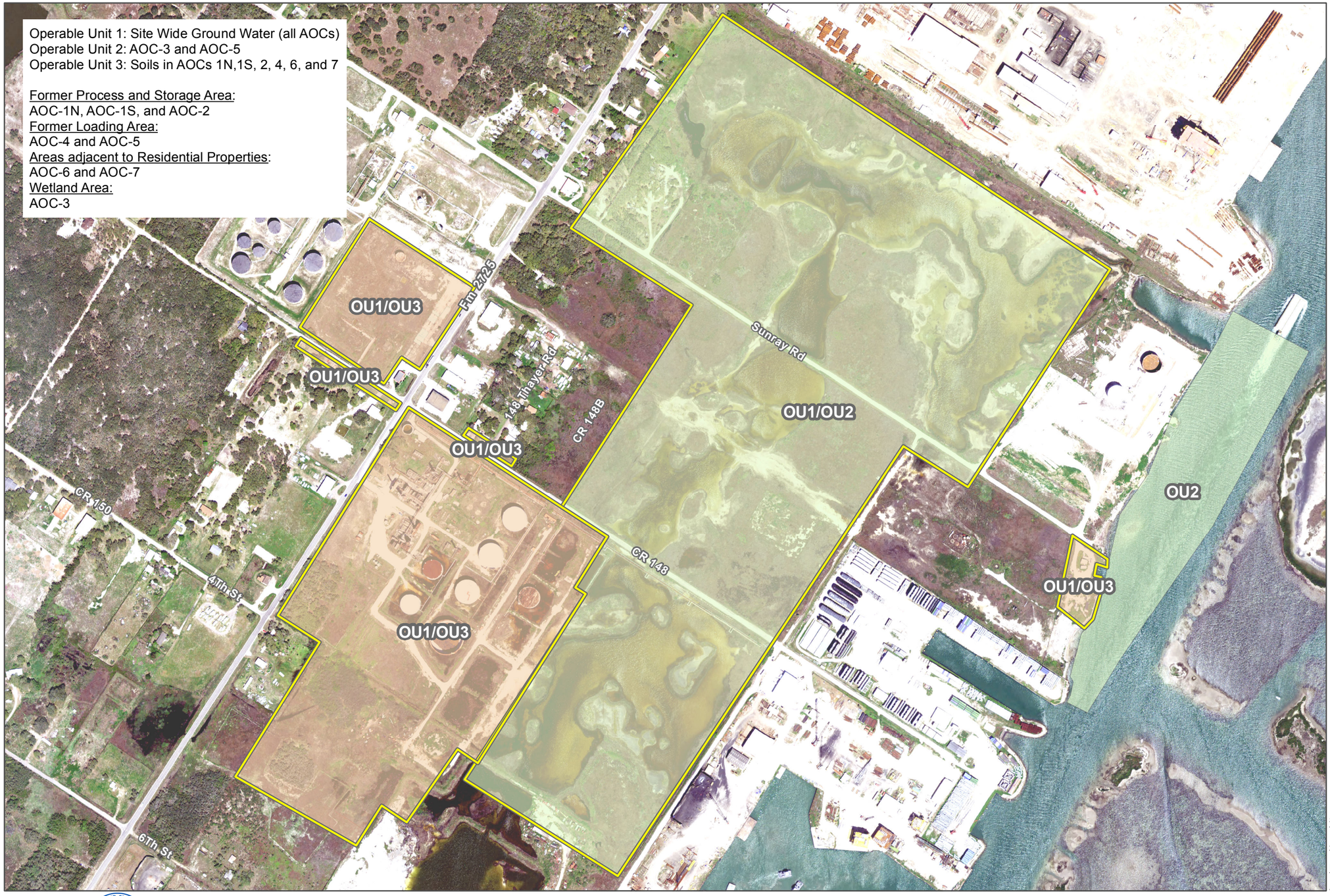
033971

Operable Unit 1: Site Wide Ground Water (all AOCs)
Operable Unit 2: AOC-3 and AOC-5
Operable Unit 3: Soils in AOCs 1N,1S, 2, 4, 6, and 7

Former Process and Storage Area:
AOC-1N, AOC-1S, and AOC-2
Former Loading Area:
AOC-4 and AOC-5
Areas adjacent to Residential Properties:
AOC-6 and AOC-7
Wetland Area:
AOC-3



N

0 250 500
Feet
1 inch = 500 feet

Legend:
- Operable Unit 1
- OU2
- OU3

Source: AOC and Pipeline Source: TRC, dated, March 10, 2011

2007/2008 Sample Source:

Image Source: 2009 Texas Orthoimagery Program, Texas Strategic Mapping Program, TNRIS, 2009

Falcon Refinery Superfund Site
Ingleside, San Patricio County,Texas

Figure 3
Site Layout Map
Proposed Plan for Operable Unit 1

2017-04-25 R:\Federal\EPA\RAC II\0088-Falcon Refinery RIFS\GIS\MXDs\PropPlan\OU1\Figure3_OUs.mxd EA-Dallas jschwertz

033972

Sources:
Area of Concern Boundary:TRC, dated March 10, 2011.

2007/2008 Samples:

Image Source: 2009 Texas Orthoimagery Program, Texas Strategic Mapping Program, TNRIS, 2009.

Falcon Refinery Superfund Site
Ingleside, San Patricio County,Texas

Figure 4
Monitoring Well Locations
Proposed Plan for Operable Unit 1

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N

0 150 300

Feet

1 inch = 300 feet

Legend:

- Operable Units Boundary
- Dissolved Solids Results

Dissolved Solids in Ground Water

- Greater than 1000 mg/L
- Greater than 10,000 mg/L

Note:
Groundwater sample locations with a "MW" or "TW" prefix indicate that the sample was collected from a permanant or temporary well, respectively.

Sources:
Area of Concern Boundary: TRC, dated March 10, 2011.

2007/2008 Samples:

Image Source: 2009 Texas Orthoimagery Program, Texas Strategic Mapping Program, TNRIS, 2009.

Falcon Refinery Superfund Site
Ingleside, San Patricio County,Texas

Figure 5: Total Dissolved Solids Concentrations in Ground Water
October 2016
Proposed Plan for Operable Unit 1

033974

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