Biological Assessment

Galena Park Condensate Splitter Project

Harris County, Texas

Prepared for

KM Liquids Terminals, LLC

Prepared by

Whitenton Group, Inc.

November 2012

Revised March 2013

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ACRONYMS AND ABBREVIATIONS

AHPS	Advanced Hydrologic Prediction Service
AERMOD	Advanced Monitoring Systems/USEPA Regulatory Model
AOI	Area of Impact
bbl/day	Barrels Per Day
bpd	Barrels Per Day
BACT	Best Available Control Technology
BA	Biological Assessment
CO	Carbon Monoxide
ESL	Effects Screening Levels
EO	Element of Occurrence
ESA	Endangered Species Act
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GEP	Good Engineering Practices
GHG	Greenhouse Gas
GLCmax	Maximum Ground Level Concentration
GPT	Galena Park Terminal
GPM	Gallons per Minute
KMLT	Kinder Morgan Liquids Terminal LLC
Pb	Lead
LAER	Lowest Achievable Emission Rate
MMBtu	One Million British Thermal Units
MSS	Maintenance, Startup, and Shutdown
MAOI	Maximum Area of Impact
MSGP	Multi-sector General Permit (EPA)
NAAQS	National Ambient Air Quality Standards
NCDC	National Climatic Data Center
NED	National Elevation Dataset (USGS)
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NWS	National Weather Service
NWI	National Wetland Inventory

NRCS	Natural Resources Conservation Service
NSPS	New Source Performance Standards
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxide
NNSR	Non-attainment New Source Review
O_3	Ozone
PM	Particulate Matter
ppmvd	Parts Per Million, Volumetric Dry
lbs	Pounds
PSD	Prevention of Significant Deterioration
POTW	Publically Owned Treatment Work
RACT	Reasonably Available Control Technology
RBLC	RACT/BACT/LAER Clearinghouse
RPS	RPS Group
SCR	Selective Catalytic Reduction
SIL	Significant Impact Level
SO_2	Sulfur Dioxide
TCEQ	Texas Commission on Environmental Quality
TNDD	Texas Natural Diversity Database
TPWD	Texas Parks and Wildlife Department
TBD	To Be Determined
US	United States
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
VOC	Volatile Organic Compound
WGI	Whitenton Group, Inc.

1.0 EXECUTIVE SUMMARY

The KM Liquids Terminals, LLC (KMLT) Galena Park Terminal (GPT) is an existing for-hire bulk petroleum storage terminal in Galena Park, Harris County, TX. Petroleum products and specialty chemicals are stored in various storage tanks and transferred in and out of the terminal tankage for external customers via pipeline, tank truck, railcar, and marine vessel. The facility consists of various storage tanks and associated piping, loading, and control equipment. KMLT proposes to construct and operate a new 100,000 barrels per day (bbl/day) condensate splitter at the existing GPT, to be constructed in two phases. The proposed condensate splitter will consist of two trains that are each capable of processing 50,000 bbl/day of petroleum condensate material. The process will utilize conventional distillation technology.

The proposed project is located adjacent to the Houston Ship Channel, less than one mile west of Federal Road and less than three miles east of Interstate 610 in Galena Park, TX. This project is a major source for nitrogen oxides (NOx), volatile organic compounds (VOC), and greenhouse gases (GHG). Since the facility is a major source for NOx and VOC and it is located in the Houston/Galveston/Brazoria Ozone Non-attainment Area, the project requires a Non-attainment New Source Review (NNSR) permit. The Texas Commission on Environmental Quality (TCEQ) is responsible for issuance of the NNSR permit. Since the source is major for GHG, a Prevention of Significant Deterioration (PSD) GHG permit will be required. The United States (US) Environmental Protection Agency (EPA) is responsible for issuing GHG PSD permits in Texas.

This Biological Assessment (BA) is a complete evaluation of the potential environmental impacts the proposed project may have on federally-protected species and/or their potential habitat. Federally-protected species evaluated in this document include threatened, endangered, and candidate species. This BA includes a pedestrian protected species habitat evaluation of the proposed construction area, a windshield assessment of all publicly-accessible habitats in the surrounding area, and an evaluation of potential environmental impacts based on air quality modeling results, construction and operations information provided by KMLT and RPS Group (RPS), KMLT's air quality permitting consultant for the project.

Construction of the proposed condensate splitter, associated infrastructure, and auxiliary equipment will take place within the existing GPT. The project footprint will also include two new pipelines within one right-of-way that will connect the condensate splitter facility to the existing industrial facility immediately south of the Project Area. The total area of the project

footprint, referred to as the "Project Area," is approximately 49.3 acres. The civil construction activities will include site preparation and drainage, installation of concrete piles, concrete foundations and mats, concrete slab on grade, structural steel, stairs and ladders.

All to the feed product to be processed by the condensate splitter project will be received via pipeline. Most of the finished products produced by the condensate splitter project are expected to go outbound via pipeline, some of the finished products will go outbound via marine vessel that will result in a small increase in marine vessel traffic within the Houston Ship Channel. The anticipated increase in vessel traffic is approximately 5-6 ships per month (~0.2 ships per day) and 15 barges per month (~0.5 barges per day), which is a small fraction of the number of vessels that currently unload at the Galena Park Dock Facility or otherwise operate within the Houston Ship Channel (~1500 ships per month[1]).

Federally-protected species considered in this BA include the green sea turtle, Houston toad, Kemp's ridley sea turtle, leatherback sea turtle, loggerhead sea turtle, Louisiana black bear, red-cockaded woodpecker, red wolf, smalltooth sawfish, Sprague's pipit, Texas prairie dawn-flower, and whooping crane. Three field surveys were completed: a pedestrian protected species habitat evaluation of the Project Area and the portions of the surrounding facility that are not restricted by stringent safety requirements; a windshield habitat evaluation of all publicly-accessible habitats within a 3-mile radius of the Project Area; and an aerial habitat evaluation of all areas within a 3-mile radius. Data were collected to describe resident vegetation communities and assess the potential for habitat and occurrence of protected species. Six habitat types were observed in the areas within a 3-mile radius of the proposed condensate splitter facility: pastureland with scattered shrubs, woodland, riparian, canal, riverine, and wetland. The areas surrounding the project location have historically been impacted by commercial, industrial, and residential activities.

In support of this BA, RPS performed dispersion modeling of air pollutants that will be emitted by the proposed project in accordance with New Source Review permitting requirements. All of the predicted off-property emission concentrations due to the project are less than the EPA Significant Impact Levels (SIL) for primary or secondary National Ambient Air Quality Standards (NAAQS).

Since all predicted emission levels are below the SILs at all locations outside of the GPT, the "action area" for this BA was determined based on the limits of other potential impacts

including the proposed project construction area, the existing GPT boundaries in accordance with the results of the air dispersion modeling, and the proposed stormwater outfall structure.

The action area has a maximum radius of approximately 0.77 mile and has the potential to effect portions of three observed habitat types: riverine, riparian, and woodland. No federally-protected threatened, endangered, or candidate species are likely to utilize these areas.

With the conservatively-predicted concentrations of routine emissions and MSS emissions being below TCEQ guideline levels for evaluating non-criteria pollutant emissions, the predicted concentrations are acceptable in that they are not expected to cause or contribute to adverse human health or welfare effects.

As required by state NSR and federal NNSR permitting, KMLT will utilize the Lowest Achievable Emission Rate (LAER) technology and Best Available Control Technology (BACT) to control/minimize emissions.

Based on the background research described in Section 9.1 and the determinations described in Section 9.2.3, the proposed project will likely have no direct or indirect impact on federally-protected species habitat.

Based on the information gathered for this BA, Whitenton Group, Inc. (WGI) biologists recommend that a finding of no effect be accepted for all twelve federally-listed threatened and endangered species.

2.0 INTRODUCTION

The KMLT GPT is a for-hire bulk petroleum storage terminal in Galena Park, Harris County, TX. Petroleum products and specialty chemicals are stored in various storage tanks and transferred in and out of the terminal tankage for external customers via pipeline, tank truck, railcar, and marine vessel. The facility consists of various storage tanks and associated piping, loading, and control equipment. KMLT proposes to construct and operate a new 100,000 barrels per day (bbl/day) condensate splitter at the existing GPT, to be constructed in two phases. The proposed condensate splitter will consist of two trains that are each capable of processing 50,000 bbl/day of petroleum condensate material. The process will utilize conventional distillation technology.

The proposed project is located near the Houston Ship Channel, less than one mile west of Federal Road and less than three miles east of Interstate 610 in Galena Park, TX (Figures 1-5 – Appendix A). This project is a major source for nitrogen oxides (NOx), volatile organic compounds (VOC), and greenhouse gases (GHG). Since the facility is a major source for NOx and VOC and it is located in the Houston Galveston Brazoria Ozone Non-attainment Area, the project requires a Non-Attainment New Source Review (NNSR) permit. For the other pollutants, CO, SO_2, $PM_{10}/PM_{2.5}$, Pb, the minor NSR permit requirements apply. This facility will meet all of the requirements for TCEQ's permitting requirements. The Texas Commission on Environmental Quality (TCEQ) is responsible for issuance of the NNSR permit. Since the source is major for GHG, a PSD GHG permit will be required. The United States (US) Environmental Protection Agency (EPA) is responsible for issuing GHG PSD permits in Texas.

By letter dated March 23, 2012, KMLT submitted a New Source Review (NSR) PSD permit application to the U.S. Environmental Protection Agency (EPA) to obtain required authorization of greenhouse gas (GHG) emissions. BAs in support of the PSD GHG permit application are recommended by the USEPA to evaluate the potential for impacts to federally-protected species from a project for which federal authorization must be obtained. To address this recommendation, KMLT contracted WGI to conduct the BA. This BA documents the complete evaluation of the potential effects of the proposed project on federally-protected species and/or their potential habitat. Protected species evaluated in this document include threatened, endangered, and candidate species. Federal regulations for protected species evaluated in this BA are described in Section 4.0.

The purpose of this BA is to research, evaluate, analyze, and document the potential for direct and indirect effects, interdependent and interrelated actions, and cumulative effects on federally-protected species as a result of the proposed project. This BA includes a pedestrian protected species habitat evaluation of the proposed construction area, a windshield survey of all observable and publicly-accessible habitats within a 3-mile radius of the Project Area, an aerial survey of habitats within a 3-mile radius of the Project Area, and an evaluation of potential environmental impacts based on air quality modeling results, construction information, operation information, and national pollutant discharge elimination system (NPDES) information provided by RPS.

The conclusion of this BA will include one of three recommended determinations of effect on federally-listed endangered, threatened, and candidate species and their habitat: "no effect," "may affect, not likely to adversely affect," or "may affect, likely to adversely affect." These

three possible determinations, in accordance with guidance offered by the US Fish and Wildlife Service (USFWS) for the purpose of Biological Assessments and Evaluations, are described in Section 4.2.

3.0 ACTION AREA

The BA process requires identification of the proposed project's "action area" within which the potential for effects on federally-protected species and their habitats are to be evaluated. "Action area" is defined in 50 CFR Section 402.02 as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The limits of the project's action area were determined based on the dispersion modeling results, the earth disturbance footprint, and any wastewater or stormwater discharge locations.

EPA has established SILs for each NAAQS. SILs are concentrations significantly below their corresponding NAAQS and constitute a de minimis threshold at or below which a potential impact is considered to be insignificant[2]. Based on the results described below in Section 8.1.1, the dispersion model predicts concentrations below the SILs at all locations outside of the GPT; therefore, the action area includes the existing GPT boundary. The action area boundary was also determined based on the earth disturbance footprint, which includes the proposed stormwater outfall structure on the south bank of Hunting Bayou and a proposed pipeline right-of-way connecting the condensate splitter to the existing industrial facility immediately to the south of the Project Area. The action area has a maximum radius of approximately 0.77 mile. The action area is demonstrated in Figures 2-5 (Appendix A).

The action area was utilized to analyze the potential impacts to federally-protected species and/or their habitat by the proposed project. The results of the analysis of potential impacts to federally-protected species are presented in Section 9 below.

4.0 AGENCY REGULATIONS

4.1 ENDANGERED SPECIES ACT

The USFWS and the National Oceanic and Atmospheric Administration - National Marine Fisheries Service (NOAA-NMFS) implement the Endangered Species Act (ESA) of 1973. "The purpose of the ESA is to protect and recover imperiled species and the ecosystems on which

they depend." Imperiled species specifically includes those listed by the USFWS as threatened or endangered[3]. Candidate species are those "the FWS has enough information to warrant proposing them for listing but is precluded from doing so by higher listing priorities[4]." Candidate species are not specifically protected by the ESA, but were evaluated in this BA.

Section 9 of the ESA prohibits the "take" of threatened and endangered species. "Take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." "Harm" is defined as "an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering[5]."

BAs include one of three recommended determinations of effect on federally-listed endangered, threatened, and candidate species and their habitat: "no effect," "may affect, not likely to adversely affect," or "may affect, likely to adversely affect." These three possible determinations, in accordance with guidance offered by the US Fish and Wildlife Service (USFWS) for the purpose of Biological Assessments and Evaluations, are described (verbatim) below[5].

1. No effect – A "no effect" determination means that there are absolutely no effects from the proposed action, positive or negative, to listed species. A "no effect" determination does not include effects that are insignificant (small in size), discountable (extremely unlikely to occur), or beneficial. "No effect" determinations do not require written concurrence from the Service unless the National Environmental Policy Act analysis is an Environmental Impact Statement. However, the Service may request copies of no effect assessments for our files.

2. May affect, not likely to adversely affect – A "may affect, not likely to adversely affect" determination may be reached for a proposed action where all effects are beneficial, insignificant, or discountable. Beneficial effects have contemporaneous positive effects without any adverse effects to the species or habitat (i.e., there cannot be a "balancing," where the benefits of the proposed action would be expected to outweigh the adverse effects – see below). Insignificant effects relate to the size of the effects and should not reach the scale where take occurs. Discountable effects are those that are extremely unlikely to

occur. This conclusion is usually reached through the informal consultation process, and written concurrence from the Service exempts the proposed action from formal consultation. The federal action agency's written request for Service concurrence should accompany the biological assessment/biological evaluation.

Note: A conclusion or finding of "may affect, but is not likely to adversely affect" by an action agency and the USFWS, consultation with the USFWS is considered complete. This is known as "informal consultation."

3. May affect, likely to adversely affect - A "may affect, likely to adversely affect" determination means that all adverse effects cannot be avoided. A combination of beneficial and adverse effects is still "likely to adversely affect" even if the net effect is neutral or positive. Section 7 of the Endangered Species Act require that the federal action agency request initiation of formal consultation with the Service when a "may affect, likely to adversely affect" determination is made. A written request for formal consultation should accompany the biological assessment/biological evaluation.

   Note: A conclusion or finding of "may affect, likely to adversely affect" by an action agency and the USFWS; or if USFWS does not concur with an action agency's finding of "not likely to adversely affect" determination, then "formal consultation" is required between the action agency and the USFWS. Formal consultation results in the USFWS issuing a biological opinion as to whether or not the action, as proposed, will jeopardize the continued existence of any listed species.

4.2 CLEAN AIR ACT REGULATIONS AND STANDARDS

The Clean Air Act requires air quality standards be maintained to protect public health and the environment. These standards are the NAAQS and are regulated by the EPA. Ambient air is the air to which the general public has access, as opposed to air within the boundaries of an industrial facility. The NAAQS are concentration limits of pollutants in ambient air within a specific averaging time. The averaging time is the time period over which the air pollutant concentrations must be met to comply with the NAAQS. The NAAQS are classified into two categories: primary and secondary standards. Primary standards are set to protect public health,

including "sensitive" populations. Secondary standards are set to protect public welfare, including the environment[6].

The EPA has established NAAQS for six air pollutants, which are commonly referred to as "criteria pollutants". These six criteria pollutants are nitrogen dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2), particulate matter (PM), carbon monoxide (CO), and lead (Pb)[6]. A geographic area whose ambient air concentration for a criteria pollutant is equal to or less than the primary standard is an attainment area. A geographic area with an ambient air concentration greater than the primary standard is a nonattainment area. A geographic area will have a separate designation for each criteria pollutant[7].

The Clean Air Act also requires the EPA to establish regulations to prevent significant deterioration of air quality in attainment areas. The EPA established PSD Increments to satisfy this requirement. A PSD Increment is a measure of the maximum allowable increase in ambient air concentrations of a criteria pollutant from a baseline concentration after a specified baseline date. A SIL is a concentration that represents a de minimis, or insignificant, threshold applied to PSD permit applicants. The SIL is a measurable limit above which a source may cause or contribute to a violation of a PSD Increment for a criteria pollutant[8]. If an individual facility projects an increase in emissions that results in ambient impacts greater than the established SIL, the permit applicant would be required to perform additional analyses to demonstrate that the proposed emissions from a project will not cause or contribute to a violation of a NAAQS or to an increase above a PSD Increment for each pollutant emitted in significant amounts by the project[9].

The air quality analysis to demonstrate compliance with NAAQS and PSD Increments is performed using computer models to simulate the dispersion of the emitted pollutants into the atmosphere and predict ground level concentrations at specified receptor locations in the area around the source of emissions. If the modeled concentration for a given pollutant and averaging period is less than the EPA-specified SIL, the project is determined to have no significant impact on ambient air quality and no further analysis is required for that pollutant and averaging period. If the SIL is predicted by the model to be exceeded for a given pollutant, further modeling of the project emissions combined with existing emission sources in the area is required to estimate total ambient concentrations. The modeling must demonstrate that the total concentration, including an appropriate background, does not exceed the applicable NAAQS and PSD Increment.

5.0 PROJECT DESCRIPTION

5.1 PROJECT PURPOSE AND LOCATION

The purpose of the project is to construct and operate a new 100,000 bbl/day condensate splitter at the existing KMLT GPT. The project will be constructed in two 50,000 bbl/day phases. The proposed condensate splitter will consist of two trains which will each process 50,000 bbl/day of petroleum condensate material to obtain products suitable for commercial use. The process utilizes conventional distillation technology. Two process flow diagrams for the proposed new equipment are provided as Figures 7-1 and 7-2 (Appendix B).

The proposed project is located near the Houston Ship Channel, less than one mile west of Federal Road and less than three miles east of Interstate 610 in Galena Park, TX (Figures 1-5 – Appendix A).

Project location information:

USGS Quad	Latitude/Longitude
Pasadena	29.737882 -95.218805

5.2 CONSTRUCTION INFORMATION

5.2.1 CONSTRUCTION DESCRIPTION

Construction of the proposed Galena Park Condensate Splitter unit, associated infrastructure, and auxiliary equipment will take place within approximately 49.3 acres of the existing GPT facility area. The project footprint will also include two new pipelines within one right-of-way that will connect the condensate splitter facility to the existing industrial facility immediately south of the Project Area. The civil construction activities include site preparation and drainage, installation of concrete piles, concrete foundations and mats, concrete slab on grade, structural steel, stairs and ladders. The construction footprint (Project Area) is shown on Figures 2-5 (Appendix A).

The projected construction start date is on or about February 1, 2013. Construction of the second train will commence within 18 months after completion of the first train. The projected

operation start date is on or about mid-March 2014 for the first 50,000 bbl/day condensate processing unit.

5.2.2 CONSTRUCTION ACTIVITIES AND SCHEDULE

The total time estimated to complete the project is approximately 64 weeks (10 weeks for site preparation and 54 weeks of field erection and startup for the first processing unit) and includes the following list of general construction activities. The second processing unit will be built within 18 month of startup of the first processing unit with the same construction timeline.

- grading and site fill to the agreed upon elevation
- install pilings
- install underground facilities and grounding grid
- install equipment and pipe rack foundations
- construct storage tanks
- install equipment, bullet tanks, and pre-fab electrical buildings
- install overhead feed line to electrical building
- install piping and instrumentation
- finalize piping to tanks
- final dress-up, drain, and stormwater outfall structure
- completion of instrumentation & electrical work
- insulation
- touch-up painting
- Commissioning and Startup

Construction of the proposed condensate splitter project will include the addition of one stormwater outfall structure to the shoreline of Hunting Bayou. A bull rock apron will be constructed to prevent bank erosion or scour at the stormwater outlet. Bull rock is a rounded flint rock that is similar to gravel, only larger. The bull rock apron will be designed to absorb the initial impact of the stormwater flow and reduce the flow velocity to a level that will not erode the stormwater outlet channel. The bull rock apron will be constructed at a zero grade for the optimal distance that will prevent erosion or scour.

The estimated number of personnel required for construction of the project is 165 for a maximum timeframe of 64 weeks (based on a 50 hours per week schedule).

5.2.3 CONSTRUCTION EQUIPMENT REQUIRED

The equipment required to complete the construction of the condensate splitter and estimated schedule for use of the equipment is listed below. The schedule will be based on the final sizing and configuration of the equipment selected (per erection requirements).

- Heavy Lift Equipment for major lifts (TBD per final weights, and lift study) – Duration TBD by final delivery schedule
- 2 to 4 Cherry Pickers (20-40 ton) - 34 weeks for two, 28 weeks for two
- 1 to 2 Fork Lifts / 1 Carry Deck Hydraulic Crane (10 ton) - 54 weeks/34 weeks
- 4 to 12 welding machines - 34 weeks (as needed)
- 3 Dozers CAT D6 (4-5 weeks)
- 3 Graders 670CH (4-5 weeks)
- 3 Rollers CAT CP 433 (4-5 weeks)
- 2 Track loader CAT963 (4-5 weeks)
- 2 Excavators CAT 318 (17 weeks)
- 1 Backhoe Case 580 (17 weeks)
- 1 Track loader CAT963 (17 weeks)
- 2 Manthis track crane (24 weeks)
- 2 Electric Welding machines with diesel operated generators (24 weeks)

5.2.4 STORMWATER

Erosion and sedimentation controls will be utilized to protect water quality during the construction and operation of the proposed project, in accordance with Section 401 of the Clean Water Act and 30 Texas Administrative Code Chapter 279 and as prescribed in the Storm Water Pollution Prevention Plan (SWPPP) required for construction.

If ancillary areas are disturbed in support of the construction project, structural controls may be used to protect surrounding areas from impacted surface runoff. The runoff from within the site is directed through a series of onsite ditches prior to discharge. Additional erosion control measures (silt fence, sandbags) may be used if excess erosion and/or sedimentation are observed during the construction phases. Re-vegetation is not a concern since the site is a heavy industrial site consisting of gravel or concrete-paved surfaces.

The existing GPT has an Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan (The Plan) in place and the facility employees are trained to implement the Plan. The Plan will be updated to incorporate the new condensate splitter as appropriate; and, will be utilized during construction, operation, and maintenance of the proposed project.

5.2.5 CONSTRUCTION NOISE LEVELS

Project engineers estimate that fence line noise levels during construction should be comparable to noise levels from activities that currently take place at the GPT.

The best available technology shall be used to maintain noise levels of the equipment below 85 decibels measured at the KMLT property fenceline.

5.3 OPERATION AND MAINTENANCE INFORMATION

5.3.1 OPERATION DESCRIPTION

The proposed condensate splitter facility to be installed in the GPT at Galena Park, Texas will process 100,000 bpd of a hydrocarbon condensate material to obtain products suitable for commercial use. The process described in the following paragraphs will utilize conventional distillation technology to accomplish this. The maximum operating schedule is 24 hours a day, 7 days a week, and 52 weeks a year. For each shift, one or two outside operators and one board man will be required for operation.

The hydrocarbon condensate is fed from storage to the stabilizer column where the lightest fraction of the condensate is distilled from the overhead at a pressure which will typically permit complete condensation of the overhead product. Any uncondensed off-gas that may be produced intermittently will be used for fuel gas in the heater. Water present in the feed will be distilled in the stabilizer and produced from the overhead receiver water boot. The overhead liquid product from the stabilizer column will be stored in pressurized storage for transfer to the truck loading rack. The feed to this stabilizer column is preheated with waste heat recovered from hot product streams to reduce the amount of fired gas heat input required for distillation. The remaining reboiler heat required to achieve the desired separation is provided by a circulating hot oil circuit. The circulating hot oil is heated in a gas-fueled direct fired heater. The bottoms stream from the stabilizer column is pressured through a preheat exchanger that is heated by circulating hot oil into the main fractionation column.

This main fractionation column splits the bottoms from the stabilizer column into four commercially acceptable streams. Two of these streams are taken off as side draws and fed to the top of individual stripping columns. Lighter material is stripped from the product draw in each of these side columns by introducing heat to the bottom of each stripper column with a reboiler exchanger heated by circulating hot oil. The stripped sidedraw vapors are returned to

the main fractionation column from the overhead of each stripper column and the stripped sidedraw products are used to preheat the feed to the process before final cooling and transfer to storage.

In addition to the sidedraw products, a bottoms product and overhead products are produced from the main fractionation column. These products represent the heaviest fraction and the lightest fractions of the stabilized condensate, respectively. Lighter material is removed from the bottoms product using natural gas for stripping. The overhead condensing system will be operated at the lowest practical pressure to minimize temperatures and improve separation. Both a liquid distillate product and a non-condensable gas stream saturated with heavier components will be produced from the overhead vapor along with column reflux. The off-gas will be compressed and cooled to make it suitable for use as fuel gas and recover as much light naphtha as practical.

In addition to the main process equipment described above, there are certain support processes that are required. This includes an elevated flare that is provided for use in emergency overpressure situations to dispose of excess process vapors. This flare utilizes a continuous pilot to ensure that unexpected release events result in safe disposal through combustion. The pilot is fueled with natural gas. A standby natural gas fired emergency power generator is also provided to maintain critical electrical services during a power outage and to minimize emergency flare loads.

Simplified process flow diagrams for the facilities described above are included as Figures 7-1 and 7-2 (Appendix B).

Required maintenance includes activities such as: pump maintenance, tank startup, tank washing, line and equipment clearing, filter change outs, unit startup and shutdown, vessel/equipment washing, vacuum trucks, catalyst change out/handling, pressure safety valves, control device maintenance, heat exchanger cleaning, and production campaign cleaning/startup. These maintenance activities would be infrequent and temporary. No additional environmental impacts are anticipated as a result of maintenance activities required for the project.

5.3.2 WATER USE

Water consumption at the GPT is not expected to increase on a routine basis in order to operate the condensate splitter. Exchangers and other equipment may be water-washed periodically to

remove salts and other deposits. This is expected to occur no more frequently than 2 or 3 times a year. The source of the wash water will be fire water, unless its contaminants are shown to be incompatible with the equipment metallurgies. The firewater source would be the Houston Ship Channel surface water.

5.3.3 WASTEWATER

The existing operations at the GPT are authorized under the EPA Multi-sector General Permit (MSGP) number TXR05W588. The GPT wastewater that is generated on site is collected via sumps, stored in above ground internal floating roof tanks, and sent via hard pipe to Gulf Coast Waste Disposal Authority, a publically owned treatment work (POTW) facility for wastewater treatment.

Less than 5 gallons per minute of wastewater is expected from the proposed project, and it is not expected to be significantly different (i.e. temperature or amount of pollutants and sediments) than wastewater currently generated by operations at the Terminal.

Flushing of the process units will be contained, treated and properly disposed of at the Gulf Coast Waste Disposal Authority POTW facility.

The existing GPT has an Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan (The Plan) in place and the facility employees are trained to implement the Plan. The Plan will be updated to incorporate the new condensate splitter as appropriate; and, will be utilized during construction, operations, and maintenance of the proposed project.

Erosion and sedimentation controls will be utilized in accordance with Section 401 of the Clean Water Act and 30 Texas Administrative Code Chapter 279 of the Texas Water Code.

5.3.4 STORMWATER

Contact stormwater will be treated and properly disposed of at the Gulf Coast Waste Disposal Authority POTW facility.

Non-contact stormwater will be discharged through an outfall structure into Hunting Bayou. A bull rock apron will be constructed to prevent bank erosion or scour at the stormwater outlet.

5.3.5 OPERATION NOISE LEVELS

Project engineers estimate that the fence line noise levels during operation should be comparable to noise levels from activities that currently take place at the terminal.

The best available technology shall be used to maintain noise levels below 85 decibels measured at the KMLT property fenceline.

5.3.6 EMISSION CONTROLS

Since the proposed condensate splitter project is subject to NNSR, the proposed project must utilize emissions controls that satisfy all requirements of the NNSR. These include emissions controls and standards that meet TCEQ's BACT guidelines and the lowest achievable emission rate (LAER) as defined in 30 TAC §116.12. LAER will be applied to each new facility that will emit VOC or NO_x[10].

5.3.6.1 NOx

Nitrogen oxides (NO_x) emissions from natural gas-fired combustion sources, including heaters, result from either the combination of elemental nitrogen with oxygen in the combustion air within the combustion device (thermal NO_x) or from the oxidation of organically-bound nitrogen contained in the fuel (fuel NO_x). Natural gas, which will be used as fuel for the proposed heaters, does not contain significant amounts of organic nitrogen; therefore, most of the NO_x emissions are considered thermal NO_x.

Each heater will be equipped with low NO_x burners and a selective catalytic reduction system (SCR) to reduce NO_x emissions. These controls will result in a maximum hourly NO_x emission rate of 0.025 lb/MMBtu. Although the heater annual NO_x emissions cap is based on 0.006 lbs/MMBtu, this low level is not expected to be achieved on all combustion units on an annual basis throughout the SCR catalyst life. Accordingly, KMLT is representing that individual combustion units will achieve the higher hourly emission rate of 0.025 lbs/MMBtu. The use of a higher hourly rate is required to account for process variations and is a common practice for similar permitted facilities. This level of control is consistent with other TCEQ BACT decisions for heaters fired with natural gas fuel. The RBLC analysis did not identify any NO_x control technologies more stringent than the proposed combination of low NO_x burners and SCR, and the proposed emission factor is consistent with the associated limits for combustion of natural gas fuel; therefore, the KMLT proposed NO_x controls represent LAER[10].

NO_x emissions from the flare are the result of thermal NO_x formation due to elemental nitrogen in the air. The flared gas streams will not contain any significant nitrogen compounds other than elemental nitrogen; therefore, no "fuel NO_x" will be produced. NO_x emissions will be minimized primarily by minimizing the amount of flaring to the extent possible. The above practices are the only available options for controlling NO_x emissions from flaring. As such, KMLT will employ these design and operating measures for the proposed flare to satisfy the LAER requirement[10].

5.3.6.2 Ammonia

Each heater will be equipped with a SCR system that will be operated to limit ammonia (NH_3) slip to 10 ppmvd (parts per million, volumetric dry: hourly and annual basis)[10]. This amount of NH_3 slip is consistent with the TCEQ's BACT guidance for SCR systems[11].

5.3.6.3 CO and VOC

CO and VOC emissions from gas-fired heaters are the result of incomplete fuel combustion caused by conditions such as low temperature, insufficient residence time, or insufficient oxygen in the residence zone. Proper fuel-to-air ratio and a design that provides the necessary residence time, temperature, and turbulence within the combustion zone ensure good combustion to minimize the emission of CO and VOC[10].

With proper combustion technology and design, generation of CO is minimized by maintaining good combustion efficiency in a gas-fired heater. Combustion efficiency in heaters is a function of both design and operation. Proper fuel-to-air ratio and a design that provides the necessary residence time, temperature, and turbulence within the combustion zone ensure good combustion. BACT guidance on the TCEQ website at the time of preparation of the permit application states that BACT for CO from heaters is an exhaust concentration of 50 ppmvd at 3% oxygen, which is equivalent to about 0.035 lb/MMBtu[10].

Good combustion practices and design are the only control methods identified in the RBLC database for CO control. The RBLC emission limit will be met on an annual average basis[10].

TCEQ does not specify a BACT/LAER guideline for VOC emissions from gas-fired heaters or flares. The RBLC data indicates that no VOC control strategies other than proper design and good combustion practices have been applied to gas-fired heaters or flares. Since no other controls are available, efficient combustion is proposed as LAER for VOC emissions.

5.3.6.4 PM/PM_{10}/$PM_{2.5}$

Emissions of PM, which includes particulate matter less than 10 microns in diameter (PM_{10}) and less than 2.5 microns in diameter ($PM_{2.5}$), from gas-fired heaters result from inert solids in the fuel and combustion air and from unburned fuel hydrocarbons that agglomerate to form particles that are emitted in the exhaust. PM/PM_{10}/$PM_{2.5}$ emissions from gas-fired heaters are inherently low because they achieve high combustion efficiencies and usually burn clean fuels[10].

TCEQ does not specify a BACT guideline for PM emissions from gas-fired heaters. The RBLC data indicates that no PM/PM_{10}/$PM_{2.5}$ control strategies other than good combustion and use of clean fuels have been applied to gas-fired heaters.

5.3.6.5 SO_2

SO_2 is formed from combusting sulfur containing fuels. The amount of SO_2 emissions is directly proportional to the sulfur content of the fuel. Emissions of SO_2 from the heaters will be controlled by burning natural gas with minimal sulfur content. The inherently low sulfur content in pipeline specification natural gas results in limited formation of SO_2 emissions and represents BACT[10].

The flare converts sulfur compounds in the waste gas streams to SO_2; therefore, proper operation of the flare inherently results in SO_2 emissions due to the intended destruction of the reduced sulfur compounds. This destruction efficiency will be met by operating the flare in accordance with the specifications for flares in New Source Performance Standards (NSPS), Subpart A, 60.18. These design and operating methods satisfy BACT for SO_2[10].

5.4 MARINE VESSEL TRAFFIC

With existing operations, the existing Galena Park Dock Facility handles approximately 40 ships per month (~1.3 ships per day) and 100 barges per month (~3.3 barges per day). Ships and barges declare arrival in Houston at Bolivar Roads in Galveston Bay and follow the Houston Ship Channel approximately 39 miles to the Galena Park Dock Facility. Vessel speed varies depending on conditions including weather, visibility, congestion, currents, and tides. The average time to traverse the 39 miles to the Galena Park Dock Facility is 5-6 hours at an average speed of 7 knots. Marine vessels that will be associated with the transport of materials for the condensate splitter project are not owned, operated, or controlled by KMLT. Therefore, KMLT cannot control the speed at which they travel through the Houston Ship Channel.

Ships that service the GPT are approximately 425-850 feet in length, 65-116 feet in width, and carry 80,000-300,000 barrels. The average ship transfer volume is 160,000 barrels. Up to approximately 1.3 ships per day would transfer an average total volume of 208,000 barrels per day.

Barges that service the GPT are approximately 200-300 feet in length, 35-55 feet in width, and carry 10,000-30,000 barrels. The average barge transfer volume is 20,000 barrels. Up to approximately 3.3 barges per day would transfer an average total volume of 66,000 barrels.

The Houston Ship Channel was designed and is maintained to accommodate heavy marine vessel traffic. It is estimated that 50 ships utilize the Houston Ship Channel daily (~1500 ships per month)[12]. Although most, if not all, of the feed products and finished products required for the proposed project are expected to go inbound and outbound via pipeline, the operation of the proposed condensate splitter project may result in a small increase in vessel traffic in the Houston Ship Channel (potential increase of less than one percent). The maximum potential increase in marine vessel traffic is 5-6 ships per month (~0.2 ships per day) and 15 barges per month (~0.5 barges per day). Six additional ships per month would transfer an average volume of 32,000 barrels per day. Fifteen barges per month would transfer an average volume of 10,000 barrels per day. Barges utilize Barge Docks 2 and 3 of the Galena Park Dock Facility. Ships utilize Ship Docks 1-4. Dock locations are identified in Plot Plan 88-MS-0060 (Appendix C).

6.0 BACKGROUND INFORMATION

6.1 GENERAL ENVIRONMENTAL INFORMATION

This section provides applicable environmental characteristics for the general region in which the project is located.

6.1.1 GENERAL REGION INFORMATION

The proposed construction site is located in Harris County within the Gulf Coast Prairies and Marshes ecoregion of Texas[13] which is in the Gulf Coastal Plain physiographic province of North America[14]. The area in which the project is located is typical for the West Gulf Coastal Plains ecoregion.

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 are invaluable breeding grounds and fish hatcheries[15].

The majority of the river basins of Texas drain towards the Gulf of Mexico. This ecoregion also receives more rainfall than many other ecoregions in Texas. As a result, this region is ecologically diverse inland as well as immediately adjacent to the coastline. Freshwater wetlands, marshes, and swamps as well as hardwood bottomlands, prairies, and oak mottes are common throughout this region[15].

The Gulf Coast Prairies and Marshes ecoregion spans the Texas coastline. Because of the abundant water resources, the rich soils, and the proximity to the coast, this area is commonly converted to cropland, ranchland, and industrial development[15]. These land uses have reduced and fragmented the critical protected species habitat throughout the region.

6.1.2 LAND USE

Harris County encompasses the Houston-Sugarland-Baytown metropolitan complex, which is one of the largest metro areas in the U.S. Based on the background review, the land use within the Project Area is predominantly industrial, commercial, and residential development with few natural habitat fragments. Land use types within the surrounding areas include commercial, residential, and industrial development, a heavily trafficked waterway, potential wetlands, and woodland (Figure 2 – Appendix A).

6.1.3 CLIMATE

According to the Natural Resource Conservation Service (NRCS), the average annual rainfall in Harris County is 48.19 inches, and the mean temperature is 69.1 degrees. The growing season lasts 300 days. In winter, the average temperature is 50°F and average daily minimum temperature is 41°F. In summer, the average temperature is 87°F and the average daily maximum temperature is 90°F. Prevailing winds are from the south and southeast, except in January when polar cold fronts cause strong north winds to occur[16]. Humidity is high in the morning, averaging over 90%, and in the afternoon, humidity values are around 60%.

As of May 8, 2012, the U.S. Drought Monitor indicated the survey area was in normal conditions[17]. According to the National Weather Service/Advanced Hydrologic Prediction Service (NWS/AHPS), the area received approximately 1.5 – 3 inches of rain within the 30 days prior to the field survey conducted in April 2012. This amount is slightly lower than the average rainfall for April, but it is within the normal range. The area was approximately 2 - 6 inches above normal for the month of March[18].

Palmer Hydrological Drought Index data obtained from the NOAA – National Climatic Data Center (NCDC)[19] for Harris County and the State of Texas are shown in Table 1 below.

Table 1. Palmer Hydrological Drought Index Comparative Summary for January[19].

Year	Harris County	East Texas	Texas
2005	Moderately moist	Mid-range to extremely moist	Mid-range to extremely moist
2006	Severe drought	Moderate drought to extreme drought	Mid-range to extreme drought
2007	Moderately moist	Moderate drought to moderately moist	Moderate drought to moderately moist
2008	Moderately moist	Mid-range to moderately moist	Mid-range to extremely moist
2009	Moderate drought	Extreme drought to moderate moist	Extreme drought to moderate moist
2010	Mid-range	Mid-range to very moist	Mid-range to very moist
2011	Mid-range	Severe drought to very moist	Severe drought to very moist
2012	Extreme drought	Severe to extreme drought	Mid-range to extreme drought

The NOAA – NCDC Hydrological Drought Index indicates that, while Harris County has been impacted by drought only three of the past eight years, the watersheds that contribute to the project region have been impacted by significant drought conditions for five out of the past eight years. Long-term drought conditions have weakened many ecosystems across Texas. While the coastline has not experienced as severe a deficiency in direct precipitation as have other areas of Texas, it is directly affected by the limited influx of freshwater from Texas' river basins.

6.1.4 TOPOGRAPHY

Harris County is located on the upper Gulf Coast with a low and flat terrain, with elevations ranging from sea level to approximately 200 feet[19]. The Project Area is flat with an elevation of approximately 23 feet above sea level (Figure 3 – Appendix A).

According to the Federal Emergency Management Agency (FEMA) flood insurance rate map, portions of the proposed project site and portions of the surrounding areas are located within a designated 100-year floodplain. FEMA floodplain designation is demonstrated in Figure 4 (Appendix A)[20].

6.1.5 GEOLOGY

The specific geologic formation found in the area is the Beaumont Formation and alluvium from the Cenozoic Era[21].

The geologic units found within and surrounding the Project Area are listed and described below in Table 2.

Table 2. Geologic Units Summary[22]

Map Unit	Unit Name and Description	Rock Types
Qal	alluvium	sand, silt, clay, mud, or gravel
Qbc	Beaumont Formation, areas predominantly clay	clay, mud, or silt
Water	water	water

6.1.6 SOILS

The dominant soils in the prairie region of Harris County are dark-colored, loamy and clayey while the soils in the northern forests are light-colored, sandy, and loamy. The soils have high shrink-swell potential and the soil types range from very poorly drained to moderately well-drained[23].

The NRCS soil units mapped within and surrounding the Project Area are listed and described below in Table 3.

Table 3. NRCS Soil Units Summary[23]

NRCS Map Unit Symbol	NRCS Map Unit Name	NRCS Map Unit Characteristics	USDA Classification				NRCS Hydric Soil
			Depth	Drainage	Permeability	Landform	
Ba	Beaumont clay	0-1% slopes	Deep and very deep	Poorly drained	Very slowly permeable	Depressions on flats	Partially hydric
Md	Verland silty clay loam	0-1% slopes	Deep and very deep	Somewhat poorly drained	Slow permeability	Meander scrolls	Partially hydric
Mu	Verland-Urban land complex	0-1% slopes	Deep and very deep	Somewhat poorly drained	-	Meander scrolls	No
W	Water						No

6.1.7 WATER RESOURCES

Harris County has abundant water resources, with its southeast border on the Gulf of Mexico. Other prominent water features in the area include Hunting Bayou, Buffalo Bayou (Houston Ship Channel), Luce Bayou, Greens Bayou, San Jacinto River, and Trinity and Galveston Bays. The low, flat topography invites freshwater and tidal influence to create a variety of aquatic ecosystems mentioned above in Section 6.1.1 General Region Information[16].

The watersheds or river basins that contribute water resources into the proposed Project Area and surrounding areas are the San Jacinto-Brazos coastal basin and the San Jacinto River basin[24]. Surface waters include the West San Jacinto, Spring, East Fork San Jacinto, Buffalo-San Jacinto, North Galveston Bay, West Galveston Bay, and the Lower Brazos.

According to the Texas Parks and Wildlife Department (TPWD) available digital data, Armand Bayou is the closest designated Ecologically Unique River and Stream Segment to the Project Area[25]. Armand Bayou is approximately 10 miles southeast of the Project Area. Hunting Bayou

is a tributary to Buffalo Bayou/Houston Ship Channel. The Houston Ship Channel is not directly connected to Armand Bayou. However, all of these waterways eventually flow into the Galveston Bay system.

Based on the background review, the water resources in the areas surrounding the project site include freshwater/storm retention ponds, freshwater emergent wetland, riverine/riparian, estuarine and marine wetland, freshwater forested/scrub-shrub wetland, and estuarine and marine deepwater. The Houston Ship Channel is less than one mile south and east of the Project Area at its closest point and Hunting Bayou is within the Project Area.

Galveston Bay and the Trinity-San Jacinto Estuary lie in the warm temperate climatic zone of the upper Texas coast and cover an area of about 600 square miles—the largest of all seven major bay and estuary (tidal) systems in Texas. Although transected by a deep (>40ft) ship channel, the average depth of the estuary is only 8.5 feet[26]. According to multiple sources including the TPWD and US Geological Survey (USGS), the Trinity-San Jacinto estuary and its component waterbodies are tidally-influenced[27].

The USFWS National Wetland Inventory (NWI) data within, and immediately adjacent to, the Project Area is demonstrated in Figure 4 (Appendix A)[28].

6.1.8 VEGETATION

Historically, the native plant community of the region was Coastal Prairie, a tallgrass prairie with scattered oak (*Quercus* sp.) trees. Most of the native coastal prairie is now pastureland, cropland, or residential, urban, commercial, and industrial development[15].

Development has converted much of the landscape to manicured lawns and ornamental vegetation, and agricultural practices led to the planting of grain sorghum, cotton, and corn. Remaining natural vegetation consists of prairie grasslands and riparian forests. Species found in the area include little bluestem (*Schizachyrium scoparium*), yellow Indiangrass (*Sorghastrum nutans*), brownseed paspalum *(Paspalum plicatulum*), gulf muhly (*Muhlenbergia capillaris*), switchgrass (*Panicum virgatum*), live oak (*Q. virginiana*), pecan (*Carya illinoensis*), elms (*Ulmus* sp.), and hackberry (*Celtis* sp.)[15,29].

6.2 FEDERALLY-PROTECTED SPECIES

6.2.1 THREATENED OR ENDANGERED SPECIES LIST

Threatened or endangered species listed by the USFWS as having the potential to occur in Harris County[30] are provided in Table 4.

Table 4. USFWS List of Threatened or Endangered Species for Harris County, Texas[30]

Common Name	Scientific Name	Species Group	USFWS List Status	NOAA-NMFS List Status	TPWD List Status
green sea turtle	*Chelonia mydas*	reptiles	E, T	E, T	T
Houston toad	*Anaxyrus houstonensis*	amphibians	E	-	E
Kemp's ridley sea turtle	*Lepidochelys kempii*	reptiles	E	E	E
leatherback sea turtle	*Dermochelys coriacea*	reptiles	E	E	E
loggerhead sea turtle	*Caretta caretta*	reptiles	T	E, T	T
Louisiana black bear	*Ursus americanus luteolus*	mammals	-	-	T
red-cockaded woodpecker	*Picoides borealis*	birds	E	-	E
red wolf	*Canis rufus*	mammals	-	-	E
smalltooth sawfish	*Pristis pectinata*	fishes	-	E	E
Sprague's pipit	*Anthus spragueii*	birds	C	-	-
Texas prairie dawn-flower	*Hymenoxys texana*	flowering plants	E	-	E
whooping crane	*Grus americana*	birds	E	-	E

List Status symbols:

E = Endangered T = Threatened C = Candidate

6.2.2 FEDERALLY-LISTED SPECIES DESCRIPTIONS

A brief description of these species and their habitat requirements are included below.

<u>Sprague's Pipit</u>

> Sprague's pipits are small, migratory passerines with a slender shape and relatively narrow bill. Their underparts are brown with broad black streaks. Legs are yellowish to pale brown. The upper mandible is dark and contrasts with the pale lower mandible[31].

The only population of Sprague's pipit occurs within North America. Known breeding sites are located in Canada, Montana, North and South Dakota, and Minnesota. Wintering grounds are located in Arizona, New Mexico, Texas, Oklahoma, Arkansas, Mississippi, Louisiana, and northern Mexico. Migration occurs in April to May and September to November[31].

The only population of Sprague's pipit occurs within North America. Known breeding sites are located in Canada, Montana, North and South Dakota, and Minnesota. Wintering grounds are located in Arizona, New Mexico, Texas, Oklahoma, Arkansas, Mississippi, Louisiana, and northern Mexico. Migration occurs in April to May and September to November[31].

Preferred habitat includes well drained, open grasslands with native midgrasses of intermediate thickness and with moderate litter depths. Preferred grasslands are undisturbed. Grazing, prescribed burning, or mowing can be tolerated after one year. Food primarily consists of arthropods, but occasionally seeds. Nests are a cup shape on the ground, made of woven dried grasses. Average clutch size is 4.5 and young are cared for by the female for approximately 25 days until fledging[31].

Red-cockaded Woodpecker

Red-cockaded woodpeckers are 8 inches long and have a solid black cap and nape, and large white cheek patches. Males have a tiny red streak (the cockade) behind the eye and near the ear. They have a barred back and a spotted breast and their bills are black and legs are gray to black[32].

The nesting season for red-cockaded woodpeckers is from April through July. Cavities are hollowed out in live pine trees for roosting and nesting (clusters). They are only built in large, old pines. The woodpeckers live in family groups of a male and female, their chicks, and young adult "helpers". These living groups provide a cooperative breeding system where some mature adults forego reproduction and assist in raising others' offspring[32].

The habitat required by red-cockaded woodpeckers is open pine woodlands and savannahs with large old pines for nesting and roosting. Large old pines are required because the cavities are excavated completely within inactive hardwood so resin does not entrap the birds. In addition, older trees have a higher incidence of heartwood decay

that makes it easier to excavate a cavity. The cavity trees must be in open stand with little or no hardwood midstory and few or no overstory hardwoods. Cavities have been found in longleaf, loblolly, shortleaf, and slash pines in mature pine forests[32].

Foraging habitat consists of mature pines with an open canopy, low densities of small pines, little or no hardwood or pine midstory, few or no overstory hardwoods, and abundant native bunchgrasses and forb groundcovers. The woodpeckers forage extensively on pines infested by southern pine beetles (bark beetles) and they concentrate their foraging on trunks and limbs of live pine trees in search of insects and small fruits[33].

Smalltooth Sawfish

Smalltooth sawfish are large elasmobranchs. They have a body similar to shark with ventral gill slits like a ray. Most notable is the long, flat snouts with pairs of teeth along the edges. Smalltooth sawfish can grow up to 25 feet in length[34].

The toothed snout is used to locate, stun, and kill fish and crustaceans. These sawfish are ovoviviparous, usually with litters of 15-20 pups[34].

Preferred habitat includes shallow coastal seas and estuaries with muddy and sandy bottoms. They are typically found close to shore, in sheltered bays and on shallow banks[34].

The US population of smalltooth sawfish is found in the Gulf of Mexico and Atlantic Ocean. Historically, these sawfish could be found throughout the Gulf of Mexico. Today, their range has shrunk to peninsular Florida[34].

Loggerhead Sea Turtle

The loggerhead sea turtle is reddish-brown marine turtle characterized by a large head with blunt jaws. Adults can be up to 500 pounds and 4 feet in length. Adult loggerheads feed on jellyfish, floating egg clusters, flying fishes, mollusks, crustaceans, and other marine animals[35].

Loggerheads occupy three ecosystems according to lifestage: terrestrial zone, neritic zone, and oceanic zone. The terrestrial zone is occupied briefly during nesting and hatching activities. Hatchlings move out to the oceanic zone until their carapace reaches

approximately 40-60 centimeters in length. Juveniles and adults primarily occupy the neritic zone (nearshore marine environment)[35].

The nesting season in the US is May through August. Nesting occurs every two to three years and is mostly nocturnal. Females can nest up to five times per season at intervals of approximately fourteen days. Hatchling emergence is mostly nocturnal. Loggerheads nest on oceanic beaches between the high tide line and dune fronts and occasionally on estuarine shorelines with suitable sand. Females prefer narrow, steeply sloped, coarse-grained beaches[35].

Distribution of the loggerhead includes the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans. Although the majority (~80%) of the US nesting activity occurs in south Florida, loggerheads nest along the Gulf and Atlantic coastlines from Texas to Virginia. Loggerheads are considered an occasional visitor to Texas[35].

Kemp's Ridley Sea Turtle

The Kemp's ridley sea turtle is considered the smallest sea turtle with an olive-gray carapace and a triangular shaped head and a hooked beak. Adults can grow to about 2 feet in length and weigh up to 100 pounds. This turtle is a shallow water benthic feeder with a diet consisting primarily of shrimp, jellyfish, snails, sea stars, and swimming crabs[36].

Kemp's ridleys, similar to loggerhead sea turtles, occupy three ecosystems according to lifestage: terrestrial zone, neritic zone, and oceanic zone. The terrestrial zone is occupied briefly during nesting and hatching activities. Hatchlings move out to the oceanic zone for an average of two years. Juveniles and adults primarily occupy the neritic zone (nearshore marine environment)[36].

Most nesting occurs on the eastern coast of Mexico, however a small number consistently nest at Padre Island National Seashore in Texas and various other locations along the Gulf and lower Atlantic coasts. Nesting occurs from May to July during daylight hours. Large numbers of females emerge for a synchronized nesting event referred to as "arribada". Arribadas are thought to be caused by female pheromone release, offshore winds, and/or lunar cycles. Females nest up to 4 times per season at intervals of 10 to 28 days. The preferred nesting beaches are adjacent to extensive swamps or large bodies of open water[36].

The Kemp's ridley turtles range includes the Gulf coasts of Mexico and the US, and the Atlantic coast of North America as far north as Nova Scotia and Newfoundland[36].

Green Sea Turtle

The green sea turtle can grow to 4 feet in length and reported weights vary from 350-850 pounds. The carapace is smooth and keelless, and the color varies with shades of black, gray, green, brown, and yellow. Adults are herbivorous. Hatchlings are omnivorous[37].

Greens occupy three ecosystems according to lifestage: terrestrial zone, neritic zone, and oceanic zone. The terrestrial zone is occupied briefly during nesting and hatching activities. Hatchlings move out to the oceanic zone until their carapace reaches approximately 20-25 centimeters in length. Juveniles and adults primarily occupy benthic feeding grounds in shallow, protected waters. Preferred feeding grounds include pastures of seagrasses and/or algae[37].

Green turtles have a worldwide distribution in tropical and subtropical waters. The nesting season in the southeastern US is June through September. Nesting is nocturnal and occurs in 2, 3, or 4-year intervals. Females nest an average of five times per season at fourteen day intervals. Hatchlings typically emerge at night. Approximately 200 to 1,100 females are estimated to nest on US beaches. Nesting occurs on high energy oceanic beaches with a sloping platform and minimal disturbance, primarily on islands with minimal disturbance. Green turtles return to the same nesting sight and are known to travel long distances between foraging areas and nesting beaches[37].

Leatherback Sea Turtle

The leatherback sea turtle is the largest sea turtle. The adult leatherback can get up to 8 feet in length and up to 2,000 pounds. The turtle lacks a "normal" turtle shell and is covered by firm, rubbery skin that is approximately 4 inches thick. Coloration is predominantly black with varying degrees of pale spotting; including a notable pink spot on the dorsal surface of the head in adults. Diet is primarily jellyfish and salp, but it is also known to feed on sea urchins, squid, crustaceans, tunicates, fish, blue-green algae, and floating seaweed[38].

Leatherbacks are highly migratory and the most pelagic of all sea turtles. Females prefer high energy, sandy beaches with vegetation immediately upslope and a beach sloped

sufficiently so the crawl to dry sand is not too far. Preferred beaches have deep, unobstructed oceanic access on continental shorelines[38].

In the United States, nesting occurs from March to July. Females nest on average six times per season at ten day intervals. Most leatherbacks return to their nesting beaches at 2 to 3-year intervals[38].

Distribution is worldwide in tropical and temperate waters of the Atlantic, Pacific, and Indian Oceans. The leatherback is also found in small numbers as far north as British Columbia, Newfoundland, and the British Isles and as far south as Australia and Argentina. The leatherback has a small presence in the US with most nesting occurring on the Florida east coast, Sandy Point, US Virgin Islands, and Puerto Rico[38].

Louisiana Black Bear

The Louisiana black bear (LBB) is a large mammal with long black hair and a short tail. The facial profile is blunt, eyes small, and a broad nose pad with large nostrils. The muzzle of the LBB is yellowish-brown. Some bears have a white patch on the lower throat and chest. Adult males are typically larger, ranging from 300-400 pounds. Adult females range in weight from 120-180 pounds. The LBB is 4 to 7 feet in length[39].

Originally, LBB were known to occur in the forests of eastern Texas, Louisiana, and Mississippi. They typically inhabit bottomland hardwood forests. Other habitat types the LBB utilizes include brackish and freshwater marshes, salt domes, and agricultural fields. These bears require large, remote tracts of land with minimal human disturbance. The last known populations in eastern Texas were in the swamps and thickets of the Big Thicket region of southeast Texas. Today, LBBs primarily occur within the boundaries of the state of Louisiana. The largest concentration exists in the Atchafalaya River and Tensas River Basins[39].

LBBs are opportunistic feeders with a diet that may consist of acorns, berries, carrion, and insect larvae. In addition the bears may feed on agricultural products such as corn, wheat, and sugarcane[39].

The breeding period for LBBs is the summer. Females begin breeding around three years of age and have a gestation period of seven or eight months. Litter size ranges from one to four being born every other year in January or February[39].

Red Wolf

The red wolf is one of only two wolf species in the world. Their fur is a reddish color and they are smaller in size than the gray wolf. The average adult red wolf grows up to 4 feet in length and 50-80 pounds[40].

Red wolves are thought to prefer brushland, forests, swamps, and prairies. Dens are known to be found in hollow trees or on the sandy slope of a hill or drainage[40].

Originally, the red wolves were found throughout the southeastern US. The USFWS declared the red wolf extinct in the wild in 1980. In 1987, captive individuals were released to the wild in North Carolina. This reintroduced population is reportedly thriving and growing[40].

Red wolves feed on rabbits, deer, raccoons, and rodents. They live in packs of 5-8, which typically consist of one breeding pair and their offspring[40]. Little information is available describing red wolf preferred habitat characteristics.

Houston Toad

Houston toads are generally dorsally light brown and speckled, but individual coloration can vary from black to red. Dorsal speckles are black and enclose one or more warts. The ventral color is cream to yellow and the chest is "suffused with black pigment and occasional black spots." Houston toads typically have dark bands on their legs and extending from each eye to the mouth. The throat of males is usually black. They are stout-bodied with short legs and rough skin. Adult Houston toads are medium-sized (2-3.5 inches) with females larger and bulkier[41].

Adult Houston toads can be observed from December to June. Breeding is partially triggered by rainfall events and warm night temperatures; and, typically peaks in February and March. Females typically visit a waterbody once a breeding season to lay eggs. Males can visit the same waterbody upwards of 15 times in one breeding season. Males are typically located in a waterbody by their breeding call, which is very long (7-22 seconds) and high pitched[42].

Houston toads require three habitat types for persistence: breeding, occupied, and dispersal. These habitat types occur within narrow bands of geologic formations in east-

central Texas. The specific geologic formations associated with potential Houston toad habitat include the Sparta, Carrizo, Goliad, Queen City, Recklaw, Weches, and Willis[42,43]. Underlying geology contributes to the mineral content of the surface soil, which Houston toads are dependent upon. Houston toads are highly sensitive to habitat degradation, fragmentation, and loss[41].

Breeding habitat consists of small pools and ephemeral ponds, including ditches, stock ponds, flooded pastures, prairie potholes, and streams. These non-flowing aquatic habitats must persist for at least 40-80 days, depending on limiting factors such as ambient temperature and available food resources. Permanent waterbodies have an increased potential for predators and impacts from livestock and agriculture, which can decrease survivability. Studies have shown that stock ponds with impacted margins were not utilized, but regained suitability after livestock access was restricted[41].

Occupied habitat includes the adjacent upland woods surrounding the breeding ponds. Adults occupy this habitat year round. Juveniles occupy this habitat prior to dispersal. Preferred occupied habitat characteristics include pine or oak woodlands interspersed with open bunchgrasses and coastal prairies over deep sandy soils within a mile of the preferred breeding ponds. These toads spend daylight hours in burrows that are self-constructed or constructed by other wildlife. They can also be found under tree roots, leaf litter, or debris[42].

Juvenile toads will disperse within days of emergence from the breeding waterbody. Juveniles require adequate dispersal habitat for species dispersion and breeding recruitment. Loosely connected terrestrial habitats are required for dispersal. Connected forested habitats allow for longer distance dispersal[42].

Tadpoles feed primarily on pollen (usually from nearby pines), the jelly envelopes of other recently hatched Houston toads, and algae on floating leaves. Adults feed primarily on ground beetles, although they have been known to eat smaller toads and ants[42].

Whooping Crane

The whooping crane is a large bird that stands approximately 5 feet tall with a wingspan of approximately 7 feet. These birds have long necks and legs, a white body, a red crown, black primary feathers, and a long, pointed beak[44].

Whooping cranes inhabit a variety of habitats due to migration; however, they primarily inhabit large wetlands. During migration, these cranes prefer to feed and roost in wetlands, rivers, and upland grain fields with other bird species. They feed on crustaceans, mollusks, amphibians, fish, rodents, small birds, and berries[44].

Parents prefer to build their nests in marshes among taller vegetation, such as sedges, for protection. Females usually lay 2 eggs per clutch and one clutch per year in April or May. The eggs hatch approximately one month later. Parents share the rearing duties, but the female takes the primary role in raising the young[44].

The main population of whooping crane migrates across the central United States and Canada. This population breeds (May to October) in Wood Buffalo National Park in Alberta, Canada and spends the winter (November to March) on the Texas coast at the Aransas National Wildlife Refuge near Rockport, Texas. They migrate (October to November and April) through the central US (North Dakota, South Dakota, Nebraska, Oklahoma, and Texas)[44].

Texas Prairie Dawn-Flower

The Texas prairie-dawn flower is a delicate annual of the sunflower family. These annuals are small (1.4-7.1 inches high) with divergent branches arising from a basal rosette. Basal leaves are somewhat fleshy, up to 0.6 inches wide, and up to 1.6 inches long. Stem leaves are linear and few. Stems or branches are terminated by a single, small flower head. Bracts of flower heads are in two series and up to 0.20 inches long. Ray flowers are minute and concealed by the bracts. Disk flowers are yellow. Fruits are small with 5 apical scales[45].

The Texas prairie-dawn flower is found in sparsely vegetated areas of fine-sandy compact soils, often associated with pimple mounds. Pimple mounds are typically 10-50 feet in diameter and composed of sandier soil than the surrounding flat areas. These sunflowers can also be found on bare spots found on sites that have historically been disturbed, such as abandoned rice fields, vacant lots, and pastures where pimple mounds have been impacted. The soil series typically associated with these flowers are the Hockley-Gessner and Katy-Aris associations, as well as the Narta series[45].

Since these bare spots dry out during hot, summer months, the Texas prairie-dawn flower completes its life cycle in the moist spring months. Most of these annuals are

dead by May with the majority of flowering and seed maturation occurring from mid-March to mid-April[45].

According to the USFWS, there is no designated critical habitat for any of the federally-listed threatened and endangered species identified in Table 4 within at least 15 miles of the survey area[46].

6.2.3 TEXAS NATURAL DIVERSITY DATABASE RESULTS

A records review of the Texas Natural Diversity Database (TNDD)[47] was completed for the proposed Project Area and surrounding areas by the TPWD on 12 August 2012. No elements of occurrence (EO) for any federally-protected species are located within the proposed Project Area or within three miles of the project site. The EO closest to the proposed Project Area is approximately six miles to the south. No federally-protected species are recorded within the survey area (maximum radius of approximately three miles).

7.0 PROTECTED SPECIES HABITAT EVALUATION

WGI completed a protected species habitat evaluation on April 23, 2012 to determine if habitat within the Project Area was likely to support any of the federally-protected species potentially occurring in Harris County. The field surveys included a pedestrian survey of the proposed Project Area and the portions of the surrounding facility that are not restricted by stringent safety requirements. The field surveys also included a windshield survey of all terrestrially accessible habitats visible from public areas within a 3-mile radius of the Project Area. The majority of the land within the 3-mile radius is privately-owned and is not visible or accessible from public areas. An aerial survey of the 3-mile radius was conducted to observe and assess the inaccessible areas for federally-protected species habitat and survey for the presence of bald or golden eagles or evidence of their nests. Data were collected to describe resident vegetation communities and assess the potential for occurrence of federally-protected species. The dominant habitats observed are described below and demonstrated in Figure 5 (Appendix A). Photographs of the proposed Project Area and accessible surrounding areas are included as Appendix D. A summary of the field survey data is provided in Appendix E.

7.1 PLANT COMMUNITIES OBSERVED

The proposed Project Area is an existing industrial facility. The southern half of the construction area is an existing spoil pile. The northern half of the construction area is woodland historically impacted by pipelines and access roads.

The area to the west and north of the proposed facility is predominantly residential. The area to the immediate south and east of the proposed facility is predominantly industrial.

The Houston Ship Channel is less than a mile to the south of the Project Area at its closest point. The Houston Ship Channel flows into the Trinity-San Jacinto Estuary and ultimately into Galveston Bay.

The dominant habitats observed in the areas surrounding the condensate splitter facility include: pastureland with scattered shrubs, woodland, riparian, canal, riverine, and wetland. A significant portion of these habitats have historically been constructed, manipulated, or impacted by industrial, commercial, and residential development.

The dominant habitats observed in the areas surrounding the Project Area include: wetland, pastureland with scattered shrubs, woodland, riparian, riverine, and canal. A significant portion of these habitats have historically been manipulated or impacted by industrial and agricultural development.

Wetland – Emergent wetlands were observed within the survey area. Dominant species observed within the wetland mosaic included *Bacopa monnieri* (herb of grace), *Iva annua* (annual marsh elder), *Amaranthus tuberculatus* (roughfruit amaranth), *Eleocharis montevidensis* (sand spikerush), and *Typha latifolia* (broadleaf cattail).

Pastureland with scattered shrubs – This habitat is previously disturbed by development and is currently an excavated basin. No water or other wetland indicators were observed. Dominant species observed included *Cynodon dactylon* (bermudagrass), *Ambrosia psilostachya* (western ragweed), and scattered *Salix nigra* (black willow) in the shrub layer.

Woodland – This habitat includes small, non-contiguous tracts. These woodlands are subject to disturbance from utility lines and industrial and agricultural development. Dominant species observed collectively included *Ulmus crassifolia* (cedar elm), *Triadica*

sebifera (Chinese tallow), *Celtis laevigata* (hackberry), *Carex texensis* (Texas sedge), *Callicarpa americana* (American beautyberry), *Smilax bona-nox* (saw greenbrier), and *Vitis rotundifolia* (muscadine grape).

Riparian – This habitat includes the woodland buffer zone adjacent to the riverine habitats. This buffer zone varies in width and is often fragmented by development. Dominant species observed collectively included hackberry, *Ligustrum japonicum* (Japanese privet), *Fraxinus pennsylvanica* (green ash), *Morella cerifera* (wax myrtle), muscadine grape, *Sabal minor* (dwarf palmetto), *Ambrosia trifida* (giant ragweed), and *Ampelopsis arborea* (peppervine).

Riverine – This habitat includes Middle Sandy Creek, East Sandy Creek, West Sandy Creek, Urmey Branch, and Coppers Creek. Dominant species observed along the banks included *Polygonum hydropiperoides* (swamp smartweed), *Campsis radicans* (trumpet creeper), *Phragmites australis* (common reed), and muscadine grape.

Canal – This habitat includes man-made drainage and flood control canals. The banks of the canals were maintained and dominated by bermudagrass.

7.2 PROTECTED SPECIES HABITAT ANALYSIS

The proposed Project Area consists of an existing spoil bank and a woodland habitat that has historically been impacted by maintained pipeline right-of-way and access roads. Habitat types surrounding the proposed project site include pastureland with scattered shrubs, woodland, riparian, canal, riverine, and wetland. The areas surrounding the project location have historically been impacted by commercial, industrial, and residential activities.

Industrial development areas are typically comprised of mainly impervious cover with minimal vegetation on site. Therefore, these areas are not likely to support any federally-protected species.

Residential areas have the potential to support migratory songbirds. Habitat to support federally-protected species other than small migratory songbirds is not likely to occur in residential areas.

The wetland habitat observed is a mosaic of emergent and shrub vegetation and open water. Based on the historic aerial photography and the pedestrian survey, this habitat has historically

been impacted by industrial and commercial development. The observable quality of this habitat ranges from low to moderate. The wetland habitat areas have the potential to support migratory birds and other wildlife.

The pastureland with scattered shrubs habitat observed is located in previously excavated basins. The observable quality of this habitat is low. The potential exists for migratory birds to utilize this habitat.

The woodland habitat areas are primarily small, fragmented tracts. The observable quality of this habitat ranges from low to moderate. The potential exists for migratory birds and other wildlife to utilize the woodland habitat.

The riverine habitat includes the Houston Ship Channel, Hunting Bayou, Greens Bayou, Sims Bayou, Vince Bayou, and Little Vince Bayou. Based on the historic aerial photography and windshield survey, this habitat has historically been impacted by industrial and recreational development. Existing development impacts to the shoreline of the Houston Ship Channel include, but are not limited to, barge dock facilities and other industrial development. The Houston Ship Channel is a navigable water of the US and is subject to industrial, commercial, and recreational traffic. The Houston Ship Channel and its tributaries are part of a tidally-influenced estuary system. The observable quality of these habitats ranges from low to moderate. The riverine habitat areas have the potential to support migratory birds and other wildlife.

The riparian habitat includes the wooded buffer adjacent to the riverine habitat. The observable quality of these habitats ranges from low to moderate. The riverine habitat areas have the potential to support migratory bird, and other wildlife.

The canal habitat areas include man-made drainage and flood control canals. The observable quality of this habitat ranges from low to moderate. The potential exists for migratory birds and other wildlife to utilize the canal habitat.

8.0 AIR QUALITY ANALYSIS

RPS completed detailed pollutant emission calculations for the proposed project in connection with its pending nonattainment NSR application with TCEQ to authorize non-GHG emissions[48].

Table 1-1 (Appendix F) is the NNSR/PSD Applicability Analysis Summary provided in the application that KMLT submitted to the TCEQ for a permit to authorize non-GHG emissions from the project.

Additionally, RPS performed dispersion modeling of the proposed emissions of air pollutants from the proposed project to support the BA. This section provides the results and evaluation of the dispersion modeling.

8.1 AIR DISPERSION MODELING RESULTS

The proposed project seeks to construct a 100,000 bbl/day condensate splitter that will be constructed in two 50,000 bbl/day phases. The modeling analysis assessed both phases. An Area of Impact (AOI) analysis was conducted as part of the required State NAAQS review for the emissions of nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter with diameter less than 10 microns (PM_{10}), particulate matter with diameter less than 2.5 microns ($PM_{2.5}$), and carbon monoxide (CO). Proposed emissions of SO2 were evaluated for compliance with applicable State Property Line standards (i.e., TCEQ Regulation 112 standards). In addition, a health effects evaluation was performed for other emissions from the proposed new sources using TCEQ Effects Screening Levels (ESLs)[50].

The predicted emissions were compared to the SILs for all NAAQS constituents[51]. A SIL is a concentration, established by the EPA, below which the project emissions are considered to have no significant contribution to the total ambient air quality concentration. If the maximum ground level concentration (GLCmax) predicted by the modeling of the project emissions is below the SIL, no further analysis is required for the pollutant and averaging period. If the predicted project GLCmax is above the SIL, further analysis is typically necessary to demonstrate that the project will not cause or contribute to the violation of an applicable standard. Air pollution standards are shown in Table 5[49].

Table 5. Standards for Comparison with Modeling for Criteria Pollutants[49]

Pollutant	Regulation	Averaging Period	Significant Impact Level (µg/m3)	Standard (µg/m3)
SO_2	NAAQS	1-hr	7.8	195
		3-hr	25	1300
		24-hr	5	1300
		Annual	1	80
NO_2	NAAQS	1-hr	7.5	188
		Annual	1	100
CO	NAAQS	1-hr	2000	40,000
		8-hr	500	10,000
PM_{10}	NAAQS	1-hr	5	150
		Annual	1	50
$PM_{2.5}$	NAAQS	1-hr	1.2	35
		Annual	0.3	15

8.1.1 CRITERIA POLLUTANT DISPERSION MODELING RESULTS AND EVALUATION

Table 6 shows the maximum predicted off-property ground-level concentrations (GLCmax) from the proposed project for each pollutant and averaging period. Project emissions are predicted to be less than the SIL for all pollutants, therefore no ambient monitoring data was addressed[51].

Table 6. Maximum Predicted Concentrations[51]

Pollutant	Standard	Averaging Period	Project GLCmax (µg/m3)	SIL (µg/m3)	Less Than SIL?
NO_2	NAAQS	1-hour	4.5	7.5	Yes
		Annual	0.3	1	Yes
CO	NAAQS	1-hour	22.0	2000	Yes
		8-hour	11.3	500	Yes
PM_{10}	NAAQS	24-hour	0.6	5	Yes
		Annual	0.03	1	Yes
$PM_{2.5}$	NAAQS	24-hour	0.6	1.2	Yes
		Annual	0.03	0.3	Yes
SO_2	NAAQS	1-hour	1.1	7.8	Yes
		3-hour	17.6	25	Yes
		24-hour	0.5	5	Yes
		Annual	0.1	1	Yes

1 - The EPA's AERMOD model calculates concentrations for a minimum time interval of 1-hour. Per TCEQ guidance, the model-predicted 1-hour concentration is compared to the 30-minute standard.
2 - The GLCmax is the maximum concentration predicted for each constituent and averaging period.

All twelve of the predicted project GLCmax values are less than the SILs applicable to the following NAAQS: 1-Hour CO, 8-Hour CO, 24-Hour PM_{10}, annual PM_{10}, 24-Hour $PM_{2.5}$, annual $PM_{2.5}$, 1-Hour NO_2, annual NO_2, 1-Hour SO_2, 3-Hour SO_2, 24-Hour SO_2, and annual SO_2. The GLCmax values for the proposed project are considered insignificant, as SILs are a small fraction of the NAAQS levels, which are set to protect the most sensitive human populations. Therefore, GLCmax values less than the SILs are not expected to impact federally-protected species and will be excluded from further analysis.

8.1.2 NON-CRITERIA POLLUTANTS MODELING RESULTS AND EVALUATION

In addition to the air quality analysis performed for criteria pollutants, RPS performed dispersion modeling and evaluated the potential for impacts from the other (non-criteria) pollutants that will emitted by the proposed project. This effects evaluation was performed in accordance with TCEQ air permitting guidelines for the assessing non-criteria pollutants. The predicted concentrations were compared with TCEQ Effects Screening Levels (ESLs)[50].

The objective of an effects evaluation is to establish off-property ground-level air concentrations (GLCs) of constituents resulting from the proposed emissions and to evaluate these GLCs for the potential to cause adverse health or welfare effects. Air dispersion modeling is used to predict the maximum off-property ground-level concentration (GLCmax) of a constituent that could occur during a one-hour (short-term) period, and the annual (long-term) average GLCmax. The maximum possible level of emissions (worst-case scenario emissions) are modeled in order to evaluate maximum potential exposure levels. The GLCmax is evaluated first, and, if needed, the GLC at the maximally effected non-industrial receptor (GLCni) is evaluated.

ESLs are not standards or emission limits, but rather are guideline concentrations that TCEQ has developed to evaluate off-property ambient air concentrations of constituents. ESLs are very conservatively based on a constituent's potential to cause adverse health effects, odor nuisances, vegetation effects, or materials damage. Health-based ESLs are set at levels lower than levels reported to produce adverse health effects, and are set to protect the general public, including sensitive subgroups such as children, the elderly, or people with existing respiratory conditions. In developing ESLs, TCEQ factors in a margin of safety to account for potential cumulative exposure (exposure to multiple airborne constituents) and aggregate exposure (exposure to a single airborne constituent multiple times or from multiple sources). If an air concentration of a constituent is below the ESL for a given constituent, adverse effects are not expected. If the concentration of a constituent is above the ESL, it is not indicative that an adverse effect will occur, but rather that further evaluation is warranted, as described in *Modeling and Effects Review Applicability: How to Determine the Scope of Modeling and Effects Review for Air Permits* (MERA)[51].

TCEQ has developed short-term and long-term ESLs to evaluate short-term and long-term emissions, respectively. "Short-term" (one-hour) ESLs are based on data concerning acute health effects, the potential for odors to be a nuisance, and effects on vegetation. "Long-term" (annual) ESLs are based on data concerning chronic health and vegetation effects. Health-based ESLs are set below levels where health effects would occur whereas welfare-based ESLs (odor and vegetation) are set based on effect threshold concentrations.

TCEQ uses a tiered approach to evaluate the potential for health and welfare effects of non-criteria pollutant emissions on a constituent-by-constituent basis. The tiers described below represent progressively more complex levels of review:

- Tier I – The off-property short-term and long-term (as applicable) concentrations are less than the ESL. The concentration is protective of public health and no further review occurs.

- Tier II – The type of receptor where a concentration above an ESL is predicted to occur is evaluated. There are two types of receptors: industrial and non-industrial. If the maximum predicted concentration at an industrial receptor is less than two times the ESL and the maximum concentration at a non-industrial receptor is less than the ESL, then the concentrations are protective of public health and no further review occurs.

- Extended Tier II -- The type of receptor where the concentration above the ESL is predicted to occur with greater magnitude and frequency than typical Tier II criteria allows is evaluated. For the four types of receptors considered (industrial over land, non-industrial over land, industrial over water, and non-industrial over water), TCEQ provides guideline "extended" magnitude and frequency levels. TCEQ initially used the extended Tier II criteria to evaluate marine vessel emissions, and now routinely applies these guidelines to all types of projects, including those that do not involve marine vessel emissions. Projects meeting the extended guidelines are usually deemed acceptable, but may still be considered on a case-by-case basis in a Tier III review.

- Tier III – Additional case-specific factors that have a bearing on the predicted concentration are analyzed. The following factors are among those that are considered: surrounding land use; magnitude of the concentration above the ESL; frequency of concentrations over the ESL; degree of conservatism in the emission calculations; and degree of conservatism in the modeling parameters or scenario modeled.

KM conducted the health effects analysis for routine emissions and maintenance, startup, and shutdown (MSS) emissions from the proposed project following TCEQ guidelines and requirements.

Routine Emissions:

KMLT modeled and evaluated predicted site-wide routine emissions for the constituents emitted by the project. This includes maximum allowable emissions from the proposed project sources, in addition to the maximum allowable emissions of the existing emission sources at the site. The following three categories of receptors present in the action area were evaluated: industrial land receptors, non-industrial land receptors (residences, recreational areas on land or water, day care centers, hospitals, schools, etc.), and industrial water receptors. Modeling showed that emissions from marine vessel loading and unloading account for a significant

portion of the proposed project's emissions. The results of the modeling were compared against the ESLs that TCEQ has established for the constituents that will be emitted by the proposed project.

Industrial Land Receptors:

TCEQ's extended Tier II effects evaluation methodology for industrial land receptors provides that, assuming members of the general public are not expected to be exposed, the following ESL frequencies are usually deemed allowable: the short-term GLCmax is less than or equal to 10 times the short-term ESL, and not above two times the ESL more than 24 hours per year; and no more than 10 of those hours have concentrations above four times the ESL. Additionally, the annual GLCmax should be less than or equal to two times the annual ESL. As shown in Table 7 below, predicted emissions from the proposed project are below the extended Tier II guideline thresholds for industrial land receptors.

Table 7. Site-wide Routine Emissions Modeling Results: Industrial Land Receptors

Constituent	Averaging Period	ESL	Industrial Land GLCmax	Fraction of ESL ("x" Times the ESL)	Number of Hours Over 2x ESL at Industrial Land GLCmax	Number of Hours Over 4x ESL at Industrial Land GLCmax	Within TCEQ Protectiveness Guideline Criteria?
		$\mu g/m^3$	$\mu g/m^3$				
TCEQ Extended Tier II Guidelines ➔					***≤ 24***	***≤ 10***	Yes/No?
Distillate	1-hour	1000	4738.6	4.74	9	1	Yes
	Annual	100	54.1	0.54	NA	NA	Yes
Naphtha	1-hour	3500	7837.4	2.24	1	0	Yes
	Annual	350	8.9	0.03	NA	NA	Yes

Non-Industrial Land Receptors:

The extended Tier II effects evaluation methodology for non-industrial land areas provide that the following ESL frequencies are usually deemed allowable: the one-hour GLCmax is less than or equal to two times the short-term ESL, and not above the ESL for more than 24 hours per year; and the long-term GLCni is less than or equal to the ESL. As shown in Table 8 below,

predicted emissions from the proposed project are below the extended Tier II guideline thresholds for non-industrial land receptors.

Table 8. Site-wide Routine Emissions Modeling Results: Non-Industrial Land Receptors

Constituent	Averaging Period	ESL	GLCni	Fraction of ESL ("x" Times the ESL)	Number of Hours Over 1x ESL at GLCmax	Within TCEQ Protectiveness Guideline Criteria?
		$\mu g/m^3$	$\mu g/m^3$			
TCEQ Extended Tier II Guidelines ➔					*≤ 24*	*Yes/No?*
Distillate	1-hour	1000	1435.0	1.4	2	Yes
	Annual	100	8.8	0.1	NA	Yes
Naphtha	1-hour	3500	1333.6	0.4	0	Yes
	Annual	350	1.8	0.005	NA	Yes

Industrial Water Receptors:

The extended Tier II effects evaluation methodology for industrial water areas provide that the following ESL frequencies are usually deemed allowable: for volatile organic compounds and exempt solvents, the one-hour GLCmax is less than or equal to 25 times the short-term ESL, and not over 10 times the ESL more than 24 hours per year; and the magnitude of the annual GLCmax is less than or equal to two times the ESL. As shown in Table 9 below, predicted emissions from the proposed project are below the extended Tier II guideline thresholds for industrial water receptors.

Table 9. Site-wide Routine Emissions Modeling Results: Industrial Water Receptors

Constituent	Averaging Period	ESL	Industrial Water GLCmax	Fraction of ESL ("x" Times the ESL)	Number of Hours Over 10x ESL at Industrial Water GLCmax	Within TCEQ Protectiveness Guideline Criteria?
		$\mu g/m^3$	$\mu g/m^3$			
TCEQ Extended Tier II Guidelines ➔					*≤ 24*	*Yes/No?*
Distillate	1-hour	1000	4220.8	4.2	0	Yes
	Annual	100	194.8	1.9	NA	Yes
Naphtha	1-hour	3500	10654.1	3.0	0	Yes
	Annual	350	66.6	0.2	NA	Yes

As shown above, predicted non-criteria pollutant concentrations at the three receptor types in the action area are within TCEQ's extended Tier II guideline levels. TCEQ regularly determines that projects with predicted emissions within those magnitudes and frequencies are acceptable in that adverse health or welfare impacts are not expected. Applying the extended Tier II guidelines demonstrates that routine emissions from the proposed project will be protective of human health and the environment, and consideration of Tier III factors supports this conclusion.

The surrounding land use is primarily industrial. The location of the GLCmax both for the industrial water areas and the industrial land areas are located along the KMLT property boundary and the concentration levels fall off away from the property line. The nearest non-industrial receptors are residences adjacent to the West side of the property, and as discussed above, the predicted constituent concentrations in residential areas are within the allowable extended Tier II guideline levels. In addition, the highest concentration in a non-industrial area (GLCni) is located in a vacant lot adjacent to railroad tracks that are approximately 700 meters north of the proposed project.

The magnitude and frequency of concentrations above an ESL are well below the extended Tier II guideline levels. Those guideline levels allow up to 24 hours over two times the ESL, and the modeling predicts only nine hours over two times the ESL for the one-hour distillate at the industrial land GLCmax. Although the extended Tier II guideline levels allow up to 10 hours over four times the ESL, modeling shows that there is only one hour over four times the ESL for

the one-hour distillate at the industrial land GLCmax. The modeling also shows that there are no concentrations above the ESL for distillate at the industrial water receptors, no concentrations above the ESL for naphtha at industrial land and water receptors, and no concentrations above the ESL for naphtha at the non-industrial receptors. And while modeling predicts that there will be only two hours above one time the ESL at the GLCni, TCEQ's extended Tier II guideline levels allow up to 24 hours over one time the GLCni. This comparison shows that the proposed project emissions are a comfortable margin below the extended Tier II guideline levels that TCEQ routinely finds acceptable.

Significant conservatism that KMLT built into the modeling and emissions calculations means that the predicted concentrations used for this analysis are significantly higher than the concentrations realistically expected from actual operation of the proposed project. KMLT's calculation of emissions from the proposed project contains multiple levels of conservatism. For example, emissions associated with marine loading activities were calculated using maximum vapor pressures, maximum temperatures, and maximum pump rates occurring at multiple docks at the same time. Additionally, the modeling is very conservative, as it assumes that emissions from marine loading activities occur 24 hours per day for 365 days per year at the maximum hourly emission rates at multiple docks. The frequency of concentrations over the ESLs were calculated by evaluating the one-hour modeling results as if they occur during the exact worst-case meteorological conditions all year.

MSS Emissions:

The analysis of MSS emissions was performed separately from the analysis of routine emissions due to the infrequent and intermittent nature of predicted MSS emissions. MSS emissions from the proposed project are acceptable based upon the evaluation guidelines in TCEQ's MERA document. Specifically, per Step 9C of the MERA guidelines, planned MSS emissions are acceptable if they are above one time the short-term ESL for no more than 24 hours per year; if they are above two times the ESL for no more than 12 hours per year; if they are above four times the ESL for no more than six hours per year; and if they are above ten times the ESL for no more than one hour per year. As shown in Table 10, predicted MSS emissions from the proposed project are within those parameters. Accordingly, the MSS emissions from the proposed project are considered acceptable per TCEQ's conservative ESL evaluation methodology.

Table 10. Proposed Project MSS Modeling Results

Constituent	Averaging Period	ESL	GLCmax	Fraction of ESL	Number of Hours Over 1x ESL at GLCmax	Number of Hours Over 2x ESL at GLCmax	Number of Hours Over 4x ESL at GLCmax	Number of Hours Over 10x ESL at GLCmax	Within TCEQ Protectiveness Guideline Criteria?
		$\mu g/m^3$	$\mu g/m^3$						
TCEQ MERA Step 9C Screening Thresholds ➔					*≤ 24*	*≤ 12*	*≤ 6*	*1*	*Yes/No?*
Distillate	1-hour	1000	11971.3	11.97	6	6	6	1	Yes
	Annual	100	0.1	0.001	NA	NA	NA	NA	Yes
Naphtha	1-hour	3500	3440.7	0.98	0	0	0	0	Yes
	Annual	350	0.1	0.0004	NA	NA	NA	NA	Yes
Y-Grade	1-hour	6100	70.5	0.01	0	0	0	0	Yes
	Annual	610	0.001	0.000001	NA	NA	NA	NA	Yes

With the conservatively-predicted concentrations of routine emissions and MSS emissions being below TCEQ guideline levels for evaluating non-criteria pollutant emissions, the predicted concentrations are acceptable in that they are not expected to cause or contribute to adverse human health or welfare effects.

9.0 EFFECTS OF THE PROPOSED ACTION

This section presents the results of the analysis of potential effects on federally-protected species as a result of the proposed condensate splitter project. The following potential effects sources are included in the analysis: air quality, water quality, noise pollution, infrastructure-related disturbance, human-related disturbance, and federally-protected species effects. 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.

9.1 AIR EMISSIONS EFFECTS BACKGROUND RESEARCH

Resources were searched extensively for data, documentation, or research regarding the potential effects of NO_2, PM, and SO_2 (criteria pollutants with the highest modeled emission rates) on flora and fauna. WGI biologists also specifically searched for information regarding concentrations and length of time of exposure at which flora and/or fauna are impacted.

Additional research included, but was not limited to, documentation of long-term and short-term exposure to airborne pollutants, accumulation of pollutants in surface water, accumulation of pollutants in various ecosystems and habitat types, the potential for pollutants to affect vegetation composition, and potential impacts to the food chain. Information regarding the general impacts airborne pollutants can have on a variety of ecosystems is included. However, very little information was located regarding specific concentrations at which potential effects occur on a long-term or short-term basis. A list of research resources is available upon request.

Air emissions effects vary greatly between regions due to differences in biota, climate, geochemistry, and hydrology. Therefore, the estimation of potential impacts on flora and fauna is highly variable and dependent upon site-specific conditions[52].

According to a publication focused on the effects of air emissions on biodiversity, in general, air emissions have a greater impact on lower life forms than higher life forms[53]. Lower life forms that would likely be the first to be impacted would include lichens, bryophytes, fungi, and soft-bodied aquatic invertebrates. Impacts to adult higher life forms are typically the result of secondary impacts to the food chain and reproduction, with the exception of extreme exposure. Potential secondary impacts include acidification, changes in food or nutrient supply, or changes to biodiversity and competition. In general, plant communities are less adaptable to changes in air quality than animals. Animals typically have the ability to migrate away from unfavorable conditions. Lower order animals, such as amphibians and fish, are known to be impacted by acidification as a result of the subsequent release of metals into water[53].

Nitrogen Dioxide and Sulfur Dioxide

According to the EPA's Integrated Science Assessment for Oxides of Nitrogen and Sulfur, sufficient evidence is present to demonstrate a causal relationship between deposition of nitrogen and sulfur, acidification, and effects on biogeochemistry related to terrestrial and aquatic ecosystems and to biota in these systems. The Nature Conservancy and the Institute of Ecosystem Studies have published two documents that describe the known effects of airborne nitrogen, sulfur, and other airborne pollutants on various ecosystems in the eastern US. Airborne NO_2 and SO_2 are known to be converted into acid particles or acid precipitation. Both forms are deposited onto soils, vegetation, and surface waters[54,55].

The potential effects of airborne sulfur dioxide on flora are acute. The sulfur dioxide gas is absorbed into the leaves and causes reducing conditions, which is toxic when the gas

concentration exceeds the capacity of the tissue. The toxic conditions kill the local plant cells. The limiting concentration is similar for many diverse species, including aquatics. Generally, significant concentrations of sulfur dioxide gas can be added to plant systems before toxicity occurs. Depending of the extent of injury, uninjured tissue maintains or regains function and develops normally[56].

The potential effects of airborne NO_2 and SO_2 on terrestrial ecosystems are generally long-term effects as opposed to short-term effects. Many soils are buffered against acid inputs and biodiversity changes are not immediately evident for vegetation species with a longer lifespan. The deposition of sulfur can result in sulfate leaching, which can cause acidification of soils and surface waters as well as the release of calcium, and magnesium. The deposition of nitrogen can result in nitrate leaching, which can cause acidification of soils and surface waters as well as the release of aluminum, calcium, and magnesium[55]. Arthropods with high-calcium needs are some of the animals inhabiting the soil that can be impacted by soil acidification. The release of aluminum into soil water can harm plant roots. The leaching of aluminum into surface waters can be toxic to aquatic plants, fish, and other aquatic organisms[54]. The accumulation of nitrogen can impact plant species competition, thereby impacting plant species composition. Nitrogen accumulation can also lead to nitrogen saturation, which impacts microorganisms, plant production, and nitrogen cycling[55,57]. Additional potential terrestrial ecosystem effects include reduced forest productivity and increased vulnerability to pests and pathogens[55].

The potential effects of airborne NO_2 and SO_2 on aquatic ecosystems include acidification and eutrophication. The effects of acidification on water quality, whether introduced by direct acid deposition or leaching from adjacent terrestrial ecosystems, include increased acidity, reduced acid neutralization capacity, hypoxia, and mobilization of aluminum[55]. Stream and lake acidification can be chronic or episodic and both can be damaging. In general, larger aquatic ecosystems have a greater buffering capacity than smaller systems. Increased acidity can reduce dissolved organic carbon and increase light penetration and visibility through the water column. Increased light penetration can result in increased macrophyte and algal growth. Increased visibility can alter the predator-prey balance. Low alkalinity waters are more susceptible to adverse effects from acidification. A pH value of 6.0 is often considered the level below which biota are at risk from acidification. Biological effects are primarily attributable to a combination of low pH and high inorganic aluminum concentration (between 2.0 and 7.5 micromoles per liter). Eutrophication is the over enrichment of nutrients into an aquatic system, which can result in excess algal growth. The decomposition of the excess algae can result in a

decrease in dissolved oxygen, which can be harmful to fish and other aquatic organisms. Wetlands, estuaries, bays, and salt marshes are generally less impaired by acid deposition than other aquatic ecosystems. However, in estuarine ecosystems, nitrogen from atmospheric and non-atmospheric sources contributes to increased phytoplankton and algal productivity, leading to eutrophication. Estuary eutrophication is an ecological problem indicated by water quality deterioration, resulting in numerous adverse effects including hypoxic zones, species mortality, and harmful algal blooms. Increased sulfur concentrations can increase the production of specific bacteria, which can convert inorganic mercury to methyl-mercury, especially in wetlands. Methyl-mercury does not appear to impact flora, but is toxic to fauna[55]. Methyl-mercury is a powerful toxin that can bioaccumulate to toxic amounts in food webs at higher trophic levels (e.g. bass, perch, otters, or kingfishers).

Particulate Matter

PM is a mixture of airborne particles resulting from fossil fuel combustion or a breakdown of crustal matter. The atmosphere can also transform VOC, NO_2, and SO_2 into PM. PM is a broad term referring to an assortment of particles that vary in their formation, chemical properties, size, mass, toxicity, and atmospheric reactivity. The EPA characterizes PM by its size: PM_{10} (particles equal to and less than 10 microns in aerodynamic diameter), $PM_{2.5}$ (fine particles that are 2.5 microns or less in diameter), $PM_{10\text{-}2.5}$ (coarse particles with a diameter between 2.5 and 10 microns), and ultrafine particles (diameter less than 0.1 microns).

Fine particles can remain in the atmosphere for days to weeks and travel through the atmosphere hundreds to thousands of kilometers, while most coarse particles typically deposit to the earth within minutes to hours and within tens of kilometers from the emission source. The potential effects of dispersed particles on aquatic ecosystems include acidification, eutrophication, and impacts to ecosystem diversity[58]. The potential effects of dispersed particles on terrestrial ecosystems include nutrient depletion in soils and damage to crops and sensitive plant species[58]. PM is also responsible for the creation of haze (i.e. reduced visibility) and has been linked to physiological effects, such as respiratory and cardiovascular dysfunctions[59,60]. Other documented adverse effects included the blinding and/or death of cattle by smoke (i.e. PM) and the occurrence of fluorosis, a teeth and bone disease, when exposed to atmospheric fluoride[61]. Mortality of birds and a decrease in nesting has been linked to sulfur dioxide, known to be capable of transforming into PM. In addition, a recent study has shown that exposure to PM can affect the genetics of an individual thus resulting in unknown long term effects[62].

Limited research is available about threshold limit values (e.g. the maximum amount of exposure without adverse effects) on sensitive wildlife populations[60,63].

9.2 AIR QUALITY EFFECTS

9.2.1 EMISSIONS

RPS completed detailed emission calculations for the condensate splitter project in accordance with the Air Permit Amendment Application requirements[48]. A summary of the total proposed annual emissions of each constituent that would be emitted by the project are provided in Table 5 (Section 7.1).

RPS also performed dispersion modeling of the emissions of constituents from the proposed condensate splitter project in accordance with PSD Permit requirements. The results of the modeling are provided as a summary of the maximum predicted concentrations in Table 6 (Section 7.2).

KMLT will utilize the best available control technology to control emissions from the project and thus minimize impacts to the surrounding environment to the maximum extent practicable. The proposed emissions limits of each constituent are consistent with both the TCEQ BACT guidance and the most stringent limits in the RBLC; and, are considered to be the top level of control available for the new and modified facilities.

Emissions resulting from gasoline and diesel-fueled vehicles and equipment during construction and maintenance are considered negligible. The project will not require a significant increase in vehicle and equipment use compared to current daily emissions for the condensate splitter facility.

9.2.2 FUGITIVE DUST

Dust will be emitted during the construction phase of the project. This emission will be minimal and temporary. Dust emissions are expected to be negligible after the site work activities are completed.

9.2.3 IMPACTS OF AIR EMISSIONS ON FLORA AND FAUNA

The current secondary NAAQS provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings[64]. Air pollution

effects vary greatly between regions due to differences in biota, climate, geochemistry, and hydrology. Because of this variation, models were developed by the EPA and were based on ecosystems that are considered the most sensitive to nitrogen and/or sulfur deposition effects. For more information regarding these case studies and analysis, refer to the EPA's Risk and Exposure Assessment for Review of the Secondary National Ambient Air Quality Standards for Oxides of Nitrogen and Oxides of Sulfur[65]. For the purposes of this BA, the most conservative and appropriate information was used to analyze potential impacts within the project area.

There is sufficient evidence to infer a causal link between nitrogen/sulfur deposition and the resulting acidification and its effects on biota[66]. The data presented in Table 11 below is taken directly from EPA's Integrated Science Assessment (ISA) for Oxides of Nitrogen and Sulfur detailing select exposure rates and related ecological effects. Nitrogen and sulfur deposition may adversely affect aquatic and terrestrial nutrient balances, acidification, availability of methyl mercury, and net primary production. This may result in declines in species fitness and richness, changes in species competition, increased susceptibility to stress/disease, habitat degradation, alterations to fire regimes, etc.

Table 11. Relationships Between Deposition Levels and Ecological Effects[66]

Kg Nitrogen/Hectare/Year	Ecological Effect
~1.5	Altered diatom communities in high elevation freshwater lakes and elevated nitrogen in tree leaf tissue high elevation forests in the western U.S.
3.1	Decline of some lichen species in the western U.S.
4	Altered growth and coverage of alpine plant species in the western U.S.
5	Onset of decline of species richness in grasslands of the U.S. and U.K.
5.5 - 10	Onset of nitrate leaching in Eastern forests of the U.S.
10-May	Multiple effects in tundra, bogs, and freshwater lakes in Europe
15-May	Multiple effects in arctic, alpine, subalpine and scrub habitats in Europe

The current secondary NAAQS were largely based on the data and models presented in the EPA's ISA and Risk and Assessment publication seeking to minimize these impacts. Since SILs

are concentrations that represent thresholds of insignificant modeled source impacts, the pollutant concentrations predicted to be less than or equal to the SILs are expected to have no significant impact on flora or fauna.

The action area is shown in Figures 2-5 (Appendix A). The action area has a maximum radius of approximately 0.77 mile and includes three observed habitat types: riverine, riparian, and woodland. None of the habitat types present within the action are expected to be routinely used by federally threatened or endangered species. The increased concentration of pollutants predicted to occur as a result of the condensate splitter project are all significantly below the SILs and are not anticipated to affect federally-protected species.

9.3 WATER QUALITY EFFECTS

9.3.1 WASTEWATER AND STORMWATER

Erosion and sedimentation controls will be utilized to protect water quality during the construction and operation of the proposed project. Erosion and sedimentation controls filter sediment and some pollutants from stormwater. Erosion and sedimentation controls also minimize erosion and slow the flow of stormwater, which allows additional time for water to reach ambient temperature and for sediment to settle out of the water column. Since erosion and sedimentation controls will be utilized to protect water quality, no effects to federally-protected species are anticipated as a result of non-contact, non-point source stormwater from the proposed condensate splitter project.

Non-contact stormwater will be discharged through an outfall structure into Hunting Bayou. Hunting Bayou is currently influenced by multiple existing drainage ditch inflows, stormwater or wastewater outfalls, and non-point source stormwater via overland flow. Since flow velocity of stormwater would be minimized by a bull rock apron and Hunting Bayou is currently influenced by stormwater, non-contact stormwater impacts to Hunting Bayou resulting from the condensate splitter project would likely be minimal and temporary.

Since GPT wastewater generated on site, as well as contact stormwater, will be treated and properly disposed of by Gulf Coast Waste Disposal Authority, no effects to federally-protected species are anticipated as a result of contact stormwater or wastewater from the proposed condensate splitter project.

9.3.2 SURFACE WATER

Portions of the action area (Appendix A) include riverine habitat (Hunting Bayou and the Houston Ship Channel). No federally-listed threatened, endangered, or candidate species are likely to utilize Hunting Bayou. The green, Kemp's ridley, and loggerhead sea turtles may incidentally occur within the Houston Ship Channel.

Since the increased concentrations of pollutants predicted to occur as a result of the condensate splitter project are all significantly below the SILs, Hunting Bayou is at the northernmost edge of the action area, and the Houston Ship Channel is at the southernmost edge of the action area; acidification, resulting from deposition or leaching, is not likely to occur as a result of the proposed condensate splitter project. If acidification is not likely to occur as a result of the proposed project, it is reasonable to assume the subsequent eutrophication will not occur.

Since it has been determined that the potential indirect effects, such as acidification and eutrophication, are unlikely to occur as a result of the proposed condensate splitter project and no federally-listed threatened, endangered, or candidate species habitat was identified within the action area, surface water within the action area will not likely be indirectly impacted by the proposed condensate splitter project.

9.4 MARINE VESSEL TRAFFIC EFFECTS

The Houston Ship Channel was designed and is maintained to accommodate heavy marine vessel traffic. It is estimated that 50 ships utilize the Houston Ship Channel daily (~1500 ships per month)[67]. As discussed in Section 5.4 above, although most, if not all, of the feed products and finished products required for the proposed project are expected to go inbound and outbound via pipeline, the operation of the proposed condensate splitter project may result in a small increase in vessel traffic in the Houston Ship Channel (potential increase of less than one percent).

Green, Kemp's ridley, and loggerhead sea turtles have the potential to intermittently occur within the Houston Ship Channel. However, no occurrences of the loggerhead sea turtle have been recorded within at least 25 miles of the action area[71]. No documented marine vessel sea turtle strikes have been found for the Houston Ship Channel.

The NOAA Fisheries Service's guidance on vessel strike avoidance measures indicates that vessels should maintain a speed of less than 10 knots to minimize potential collision with sea

turtles[68]. Marine vessels that will be associated with the transport of materials for the condensate splitter project are not owned, operated, or controlled by KMLT. Therefore, KMLT cannot control the speed at which they travel through the Houston Ship Channel. Any vessels that may be associated with the condensate splitter project are expected to travel at speeds consistent with current large vessel traffic (an average of 7 knots) while traveling through the Houston Ship Channel, which is below the recommended 10 knot speed to minimize or avoid collision with sea turtles.

Based on the information provided above, the potential for marine vessel collision with sea turtles as a result of the condensate splitter project would be insignificant or negligible.

9.5 NOISE EFFECTS

KMLT project engineers estimate that noise levels during construction should be comparable to noise levels from maintenance activities that currently take place at the plant.

The best available technology shall be used to maintain noise levels of the furnace and auxiliary equipment below 85 decibels measured at the KMLT property fenceline.

No noise effects to federally-protected species are anticipated as a result of the condensate splitter project.

9.6 INFRASTRUCTURE-RELATED EFFECTS

The Project Area includes an existing spoil pile and a woodland habitat. The woodland will be impacted by the construction activities. This woodland habitat has historically been impacted by utility lines, access roads, and what appear to be man-made inlets connected to Hunting Bayou. No impacts to federally-protected threatened, endangered, or candidate species as a result of the infrastructure construction of the condensate splitter project are anticipated.

9.7 HUMAN ACTIVITY EFFECTS

Construction and operation of the proposed condensate splitter project will not require significant additional human activity compared to typical maintenance activities that occur at the Terminal on a regular basis.

No additional effects to federally-protected species are expected as a result of the increase in human activity associated with the condensate splitter project.

9.8 FEDERALLY-PROTECTED SPECIES EFFECTS

9.8.1 FEDERALLY-LISTED THREATENED AND ENDANGERED SPECIES

9.8.1.1 Green Sea Turtle

Potential to Occur in the Action Area

Nesting occurs on high energy oceanic beaches, primarily on islands with minimal disturbance. Juveniles and adults primarily occupy benthic feeding grounds in shallow, protected waters. Preferred feeding grounds include pastures of seagrasses and/or algae.

The action area is located inland, approximately 15 miles upstream from Galveston Bay. No habitats with the potential to support foraging green sea turtles are located within at least 15 miles of the Project Area. The nearest known seagrass bed is approximately 29 miles to the east in Trinity Bay[69].

The shorelines of the Houston Ship Channel/Buffalo Bayou and the upper reaches of Galveston Bay are heavily impacted by dock facilities and industrial development. The portion of the Houston Ship Channel included in the action area is industrially and commercially developed, has a maintained, dredged channel, and is considered a high traffic area for commercial and industrial shipping. No habitats with the potential to support nesting green sea turtles are located within at least 38 miles of the Project Area. The closest known green sea turtle nesting location is the Padre Island National Seashore, greater than 200 miles southwest of the Project Area[70]. Designated USFWS critical habitat for the green sea turtle is Culebra Island, Puerto Rico and its surrounding waters[46]. The closest known observations of green sea turtles occurred in Galveston Bay (approximately 25 miles south of the Project Area)[47].

Although no known observations of green sea turtles have been found within the Buffalo Bayou portion of the Houston Ship Channel, the potential exists for green sea turtles to incidentally occur within the Houston Ship Channel/Buffalo Bayou. Since the Houston Ship Channel does not have potential foraging habitat and is subject to heavy shipping traffic, any occurrence of green sea turtles within this area would be rare and temporary. Hunting Bayou is a shallow and narrow channel that is not conducive for green sea turtles. Green sea turtles will not likely occur within Hunting Bayou. The portion of Hunting Bayou within the action area is 0.90 river mile upstream of the confluence with the Houston Ship Channel.

Hunting Bayou does not possess preferred green sea turtle nesting or feeding habitat. The potential exists for green sea turtles to incidentally occur within the Houston Ship Channel. No occurrences of the green sea turtle have been recorded within at least 25 miles of the action area[71]. Green sea turtles would not likely occur within the action area.

Potential Effects to Green Sea Turtles

The green sea turtle will not be directly impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance.

Since the concentrations of criteria pollutants predicted to occur as a result of the condensate splitter project are all significantly below the SILs and no potential green sea turtle habitat has been identified within the action area, no impacts to the green sea turtle are anticipated from project criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions concentrations are below TCEQ guideline levels and no emissions of mercury or other heavy metals are anticipated, no impacts to the green sea turtle are anticipated from project non-criteria pollutant air emissions.

All wastewater and contact stormwater associated with construction and operation of the proposed project will be treated by Gulf Coast Waste Disposal Authority and will not impact the green sea turtle.

Since the flow velocity of non-contact stormwater would be minimized by the bull rock apron and because stormwater effluent discharged into Hunting Bayou from the condensate splitter project would reach ambient water quality conditions before it reaches the Houston Ship Channel, any transient green sea turtles will not be impacted by stormwater as a result of the proposed condensate splitter project.

Based on the information provided in Section 9.4, the potential for marine vessel collision with green sea turtles as a result of the condensate splitter project would be insignificant or negligible.

Determination of Effect

The proposed action will have no effect on the green sea turtle.

9.8.1.2 Houston Toad

Potential to Occur in the Project Area

Houston toads require three habitat types for persistence: breeding, occupied, and dispersal. Breeding habitat consists of small pools and ephemeral ponds. Occupied habitat includes the adjacent upland woods surrounding the breeding ponds. Loosely connected terrestrial habitats are required for dispersal[41,42]. Houston toads require loose, deep sands and still or flowing waters.

The closest, most recent detections of Houston toads have occurred in Austin County, which is greater than 50 miles to the west of the action area[43].

No habitat with the potential to support the Houston toad was observed within the action area or within the 3-mile survey area. No sandy soils were observed in the Project Area and the surrounding area is heavily impacted by residential and industrial development. No designated critical habitat is located within at least 16 miles of the project site[46]. Houston toads would not likely occur within the action area.

Potential Effects to Houston Toads

The Houston toad will not be directly impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance.

Since the concentrations of criteria pollutants predicted to occur as a result of the condensate splitter project are all significantly below the SILs and no potential Houston toad habitat has been identified within the action area, no impacts to the Houston toad are anticipated from project criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions concentrations are below TCEQ guideline levels and no emissions of mercury or other heavy metals are anticipated, no impacts to the Houston toad are anticipated from project non-criteria pollutant air emissions.

All wastewater and contact stormwater associated with construction and operation of the proposed project will be treated by Gulf Coast Waste Disposal Authority and will not impact these toads.

Since the flow velocity of non-contact stormwater would be minimized by the bull rock apron and because stormwater effluent discharged into Hunting Bayou from the condensate splitter

project would reach ambient water quality conditions before it reaches the Houston Ship Channel, Houston toads will not be impacted by stormwater as a result of the proposed condensate splitter project.

Determination of Effect

The proposed action will have no effect on the Houston toad.

9.8.1.3 Kemp's Ridley Sea Turtle

Potential to Occur in the Action Area

Nesting occurs on high energy oceanic beaches, primarily adjacent to extensive swamps or large bodies of open water. This turtle is a shallow water benthic feeder with a diet consisting primarily of shrimp, jellyfish, snails, sea stars, and swimming crabs[36].

The action area is located inland, approximately 15 miles upstream from Galveston Bay. No habitats with the potential to support foraging Kemp's ridley sea turtles are located within at least 1 mile of the Project Area. The Houston Ship Channel/Buffalo Bayou is a dredged, deepwater channel. However, the shallow shorelines have the potential to support prey for Kemp's ridley sea turtles.

The shorelines of the Houston Ship Channel/Buffalo Bayou and the upper reaches of Galveston Bay are heavily impacted by dock facilities and industrial development. The portion of the Houston Ship Channel included in the action area is industrially and commercially developed, has a maintained, dredged channel, and is considered a high traffic area for commercial and industrial shipping. No habitats with the potential to support nesting Kemp's ridley sea turtles are located within at least 38 miles of the Project Area. The closest known Kemp's ridley sea turtle nesting location is Bolivar Peninsula, which is more than 36 miles (southeast) of the Project Area[71]. USFWS designated critical habitat is not yet designated for this species[46].

Although no known observations of Kemp's ridley sea turtles have been found within the Buffalo Bayou portion of the Houston Ship Channel, the potential exists for Kemp's ridley sea turtles to incidentally occur within the Houston Ship Channel/Buffalo Bayou. Since the Houston Ship Channel has limited potential foraging habitat and is subject to heavy shipping traffic, any occurrence of Kemp's ridley sea turtles within this area would be rare and temporary. Hunting Bayou is a shallow and narrow channel that is not conducive for Kemp's ridley sea turtles. Kemp's ridley sea turtles will not likely occur within Hunting Bayou. The portion of Hunting

Bayou within the action area is 0.90 river mile upstream of the confluence with the Houston Ship Channel.

Hunting Bayou does not possess preferred Kemp's ridley sea turtle nesting or feeding habitat. The potential exists for Kemp's ridley sea turtles to incidentally occur within the Houston Ship Channel. No occurrences of the Kemp's ridley sea turtle have been recorded within at least 25 miles of the action area[71]. Kemp's ridley sea turtles would not likely occur within the action area.

Potential Effects to Kemp's Ridley Sea Turtles

The Kemp's ridley sea turtle will not be directly impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance.

Since the concentrations of criteria pollutants predicted to occur as a result of the condensate splitter project are all significantly below the SILs and no potential Kemp's ridley sea turtle habitat has been identified within the action area, no impacts to the Kemp's ridley sea turtle are anticipated from project criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions concentrations are below TCEQ guideline levels and no emissions of mercury or other heavy metals are anticipated, no impacts to the Kemp's ridley sea turtle are anticipated from project non-criteria pollutant air emissions.

All wastewater and contact stormwater associated with construction and operation of the proposed project will be treated by Gulf Coast Waste Disposal Authority and will not impact the Kemp's ridley sea turtle.

Since the flow velocity of non-contact stormwater would be minimized by the bull rock apron and stormwater effluent discharged into Hunting Bayou from the condensate splitter project would reach ambient water quality conditions before it reaches the Houston Ship Channel, any transient Kemp's ridley sea turtles will not be impacted by stormwater as a result of the proposed condensate splitter project.

Based on the information provided in Section 9.4, the potential for marine vessel collision with Kemp's ridley sea turtles as a result of the condensate splitter project would be insignificant or negligible.

Determination of Effect

The proposed action will have no effect on the Kemp's ridley sea turtle.

9.8.1.4 Leatherback Sea Turtle

Potential to Occur in the Action Area

Preferred nesting habitat includes high energy, sandy beaches with vegetation immediately upslope and a beach sloped sufficiently so the crawl to dry sand is not too far. Preferred beaches have deep, unobstructed oceanic access on continental shorelines. Juveniles and adults are pelagic and primarily occupy deep water habitat[38].

The action area is located inland, approximately 15 miles upstream from Galveston Bay. No habitats with the potential to support foraging leatherback sea turtles are located within at least 42 miles of the Project Area.

The shorelines of the Houston Ship Channel/Buffalo Bayou and the upper reaches of Galveston Bay are heavily impacted by dock facilities and industrial development. The portion of the Houston Ship Channel included in the action area is industrially and commercially developed, has a maintained, dredged channel, and is considered a high traffic area for commercial and industrial shipping. No habitats with the potential to support nesting leatherback sea turtles are located within at least 38 miles of the Project Area. No recent recorded observations of leatherback nesting locations in Texas have been found[71]. The USFWS-designated critical habitat for the leatherback sea turtle includes the coastal waters adjacent to Sandy Point, St. Croix, the US Virgin Islands, and the US West Coast [46].

No known observations of leatherback sea turtles have been recorded within the Buffalo Bayou portion (upstream) of the Houston Ship Channel. Any incidental occurrence of leatherback sea turtles within the Houston Ship Channel would be highly unlikely. Hunting Bayou is a shallow and narrow channel that is not conducive for leatherback sea turtles. Leatherback sea turtles will not likely occur within Hunting Bayou. The portion of Hunting Bayou within the action area is 0.90 river mile upstream of the confluence with the Houston Ship Channel.

Hunting Bayou does not possess preferred leatherback sea turtle nesting or feeding habitat. The potential exists for leatherback sea turtles to incidentally occur within the Houston Ship Channel is very small. No occurrences of the leatherback sea turtle have been recorded within at

least 25 miles of the action area[71]. Leatherback sea turtles would not likely occur within the action area.

Potential Effects to Leatherback Sea Turtles

The leatherback sea turtle will not be directly impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance.

Since the concentrations of criteria pollutants predicted to occur as a result of the condensate splitter project are all significantly below the SILs and no potential leatherback sea turtle habitat has been identified within the action area, no impacts to the leatherback sea turtle are anticipated from project criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions concentrations are below TCEQ guideline levels and no emissions of mercury or other heavy metals are anticipated, no impacts to the leatherback sea turtle are anticipated from project non-criteria pollutant air emissions.

All wastewater and contact stormwater associated with construction and operation of the proposed project will be treated by Gulf Coast Waste Disposal Authority and will not impact the leatherback.

Since the flow velocity of non-contact stormwater would be minimized by the bull rock apron and because stormwater effluent discharged into Hunting Bayou from the condensate splitter project would reach ambient water quality conditions before it reaches the Houston Ship Channel, any transient leatherback sea turtles will not be impacted by stormwater as a result of the proposed condensate splitter project.

The Houston Ship Channel is currently subject to heavy marine vessel traffic. No documented occurrences of leatherback sea turtles within the Houston Ship Channel have been found and any occurrence would be highly unlikely. No potential effects to leatherback sea turtles from potential the increase in marine vessel traffic are anticipated as a result of the proposed condensate splitter project.

Determination of Effect

The proposed action will have no effect on the leatherback sea turtle.

9.8.1.5 Loggerhead Sea Turtle

Potential to Occur in the Action Area

Nesting occurs on oceanic beaches between the high tide line and dune fronts and occasionally on estuarine shorelines with suitable sand. Females prefer narrow, steeply sloped, coarse-grained beaches. This turtle is a shallow water benthic feeder with a diet consisting primarily of shrimp, jellyfish, snails, sea stars, and swimming crabs[35].

The action area is located inland, approximately 15 miles upstream from Galveston Bay. No habitats with the potential to support foraging loggerhead sea turtles are located within at least 1 mile of the Project Area. The Houston Ship Channel/Buffalo Bayou is a dredged, deepwater channel. However, the shallow shorelines have the potential to support prey for loggerhead sea turtles.

The shorelines of the Houston Ship Channel/Buffalo Bayou and the upper reaches of Galveston Bay are heavily impacted by dock facilities and industrial development. The portion of the Houston Ship Channel included in the action area is industrially and commercially developed, has a maintained, dredged channel, and is considered a high traffic area for commercial and industrial shipping. No habitats with the potential to support nesting loggerhead sea turtles are located within at least 38 miles of the Project Area. The closest known loggerhead sea turtle nesting location is Bolivar Peninsula, more than 36 miles southeast of the Project Area[71]. USFWS designated critical habitat is not yet designated for this species[46].

Although no known observations of loggerhead sea turtles have been found within the Buffalo Bayou portion of the Houston Ship Channel, the potential exists for loggerhead sea turtles to incidentally occur within the Houston Ship Channel/Buffalo Bayou. Since the Houston Ship Channel has limited potential foraging habitat and is subject to heavy shipping traffic, any occurrence of loggerhead sea turtles within this area would be rare and temporary. Hunting Bayou is a shallow and narrow channel that is not conducive for loggerhead sea turtles. loggerhead sea turtles will not likely occur within Hunting Bayou. The portion of Hunting Bayou within the action area is 0.90 river mile upstream of the confluence with the Houston Ship Channel.

Hunting Bayou does not possess preferred loggerhead sea turtle nesting or feeding habitat. The potential exists for loggerhead sea turtles to incidentally occur within the Houston Ship

Channel. No occurrences of the loggerhead sea turtle have been recorded within at least 25 miles of the action area[71]. Loggerhead sea turtles would not likely occur within the action area.

Potential Effects to Loggerhead Sea Turtles

The loggerhead sea turtle will not be directly impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance.

Since the concentrations of criteria pollutants predicted to occur as a result of the condensate splitter project are all significantly below the SILs and no potential loggerhead sea turtle habitat has been identified within the action area, no impacts to the loggerhead sea turtle are anticipated from project criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions concentrations are below TCEQ guideline levels and no emissions of mercury or other heavy metals are anticipated, no impacts to the loggerhead sea turtle are anticipated from project non-criteria pollutant air emissions.

All wastewater and contact stormwater associated with construction and operation of the proposed project will be treated by Gulf Coast Waste Disposal Authority and will not impact the loggerhead sea turtle.

Since the flow velocity of non-contact stormwater would be minimized by the bull rock apron and because stormwater effluent discharged into Hunting Bayou from the condensate splitter project would reach ambient water quality conditions before it reaches the Houston Ship Channel, any transient loggerhead sea turtles will not be impacted by stormwater as a result of the proposed condensate splitter project.

Based on the information provided in Section 9.4, the potential for marine vessel collision with loggerhead sea turtles as a result of the condensate splitter project would be insignificant or negligible.

Determination of Effect

The proposed action will have no effect on the loggerhead sea turtle.

9.8.1.6 Louisiana Black Bear

Potential to Occur in the Action Area

Louisiana black bears typically inhabit bottomland hardwood forests. Other habitat types the Louisiana black bear utilizes include brackish and freshwater marshes, salt domes, and agricultural fields. These bears require large, remote tracts of land with minimal human disturbance[39].

No habitat with the potential to support the Louisiana black bear was observed within the action area.

Although some characteristics of the woodland habitat type meet the qualifications for Louisiana black bear habitat, these woodlands are not large enough and are frequently subject to human disturbance. These woodlands would not likely support the Louisiana black bear. The USFWS-designated critical habitat for the Louisiana black bear is located in 15 counties in Louisiana[46]. No known observations of the Louisiana black bear in or near the Project Area have been found.

Potential habitat for the Louisiana black bear does not exist within the action area or within the 3-mile survey area. Louisiana black bears would not likely occur within the action area.

Potential Effects to Louisiana Black Bears

The Louisiana black bear will not be directly impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance.

Since the concentrations of criteria pollutants predicted to occur as a result of the condensate splitter project are all significantly below the SILs and no potential Louisiana black bear habitat has been identified within the action area, no impacts to the Louisiana black bear are anticipated from project criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions concentrations are below TCEQ guideline levels and no emissions of mercury or other heavy metals are anticipated, no impacts to the Louisiana black bear are anticipated from project non-criteria pollutant air emissions.

All wastewater and contact stormwater associated with construction and operation of the proposed project will be treated by Gulf Coast Waste Disposal Authority and will not impact the Louisiana black bear.

Since the flow velocity of non-contact stormwater would be minimized by the bull rock apron and because stormwater effluent discharged into Hunting Bayou from the condensate splitter project would reach ambient water quality conditions before it reaches the Houston Ship Channel, the Louisiana black bear will not be impacted by stormwater as a result of the proposed condensate splitter project.

Determination of Effect

The proposed action will have no effect on the Louisiana black bear.

9.8.1.7 Red-Cockaded Woodpecker

Potential to Occur in the Action Area

Red-cockaded woodpeckers are typically associated with mature live pine trees, such as longleaf, loblolly, shortleaf, and slash pines. Cavity trees are usually within open stands with little or no hardwood mid-story and few to now over-story hardwoods. Foraging habitat consists of mature pines with an open canopy, low densities of small pines, little or no hardwood or pine midstory, few or no overstory hardwoods, and abundant native bunchgrasses and forb groundcovers[33].

No habitat with the potential to support the red-cockaded woodpeckers was observed within the action area or within the 3-mile survey area.

According to the TPWD, red-cockaded woodpeckers were once prevalent throughout east Texas. However, these woodpeckers have been extirpated from many Texas counties, including Harris County. The closest known populations of red-cockaded woodpeckers are in Montgomery County, greater than 20 miles north of the action area[72]. Red-cockaded woodpeckers would not likely occur within the action area.

Potential Effects to Red-Cockaded Woodpeckers

The red-cockaded woodpecker will not be directly impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance.

Since the concentrations of criteria pollutants predicted to occur as a result of the condensate splitter project are all significantly below the SILs and no potential red-cockaded woodpecker habitat has been identified within the action area, no impacts to the red-cockaded woodpecker

are anticipated from project criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions concentrations are below TCEQ guideline levels and no emissions of mercury or other heavy metals are anticipated, no impacts to the red-cockaded woodpecker are anticipated from project non-criteria pollutant air emissions.

All wastewater and contact stormwater associated with construction and operation of the proposed project will be treated by Gulf Coast Waste Disposal Authority and will not impact the red-cockaded woodpecker.

Since the flow velocity of non-contact stormwater would be minimized by the bull rock apron and because stormwater effluent discharged into Hunting Bayou from the condensate splitter project would reach ambient water quality conditions before it reaches the Houston Ship Channel, the red-cockaded woodpecker will not be impacted by stormwater as a result of the proposed condensate splitter project.

Determination of Effect

The proposed action will have no effect on the red-cockaded woodpecker.

9.8.1.8 Red Wolf

Potential to Occur in the Action Area

Red wolves are a very rare species in the wild. Only one known population exists in the wild and is located in North Carolina. Red wolves are thought to prefer brushland, forests, swamps, and prairies. Dens are known to be found in hollow trees or on the sandy slope of a hill or drainage[40].

Habitat with the potential to support the red wolf was not observed within the action area.

Red wolves are known to be limited in the wild to select locations in North Carolina[40]. No known observations of the red wolf in or near the Project Area have been found.

Potential habitat for the red wolf does not exist within the action area or within the 3-mile survey area. Red wolves would not likely occur within the action area.

Potential Effects to Red Wolves

The red wolf will not be directly impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance.

Since the concentrations of criteria pollutants predicted to occur as a result of the condensate splitter project are all significantly below the SILs and no potential red wolf habitat has been identified within the action area, no impacts to the red wolf are anticipated from project criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions concentrations are below TCEQ guideline levels and no emissions of mercury or other heavy metals are anticipated, no impacts to the red wolf are anticipated from project non-criteria pollutant air emissions.

All wastewater and contact stormwater associated with construction and operation of the proposed project will be treated by Gulf Coast Waste Disposal Authority and will not impact the red wolf. Since the flow velocity of non-contact stormwater would be minimized by the bull rock apron and because stormwater effluent discharged into Hunting Bayou from the condensate splitter project would reach ambient water quality conditions before it reaches the Houston Ship Channel, the red wolf will not be impacted by stormwater as a result of the proposed condensate splitter project.

Determination of Effect

The proposed action will have no effect on the red wolf.

9.8.1.9 Smalltooth Sawfish

Potential to Occur in the Action Area

Preferred habitat includes shallow coastal seas and estuaries with muddy and sandy bottoms. They are typically found close to shore, in sheltered bays and on shallow banks[34]. Known locations of smalltooth sawfish are restricted to portions of southern Florida[73].

No habitat with the potential to support the smalltooth sawfish was observed within the action area or within the 3-mile survey area.

No habitats with the potential to support the smalltooth sawfish are located within at least 15 miles of the Project Area and no critical habitat is located within 15 miles of the Project Area[46].

No known observations of smalltooth sawfish have been found in or near Galveston Bay (approximately 15 miles south of the Project Area).

Potential habitat for the smalltooth sawfish does not exist within the action area. Smalltooth sawfish would not likely occur within the action area.

Potential Effects to Smalltooth Sawfish

The smalltooth sawfish will not be directly impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance.

Since the concentrations of criteria pollutants predicted to occur as a result of the condensate splitter project are all significantly below the SILs and no potential smalltooth sawfish habitat has been identified within the action area, no impacts to the smalltooth sawfish are anticipated from project criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions concentrations are below TCEQ guideline levels and no emissions of mercury or other heavy metals are anticipated, no impacts to the smalltooth sawfish are anticipated from project non-criteria pollutant air emissions.

All wastewater and contact stormwater associated with construction and operation of the proposed project will be treated by Gulf Coast Waste Disposal Authority and will not impact these sawfish.

Since the flow velocity of non-contact stormwater would be minimized by the bull rock apron and because stormwater effluent discharged into Hunting Bayou from the condensate splitter project would reach ambient water quality conditions before it reaches the Houston Ship Channel, the smalltooth sawfish will not be impacted by stormwater as a result of the proposed condensate splitter project.

Determination of Effect

The proposed action will have no effect on the smalltooth sawfish.

9.8.1.10 Texas Prairie Dawn-Flower

Potential to Occur in the Action Area

The Texas prairie-dawn flower is found in sparsely vegetated areas of fine-sandy compact soils, often associated with pimple mounds. These sunflowers can also be found on bare spots found

on sites that have historically been disturbed, such as abandoned rice fields, vacant lots, and pastures where pimple mounds have been impacted[45].

No habitat with the potential to support the Texas prairie-dawn flower was observed within the action area or within the 3-mile survey area. Further, the soils mapped by the NRCS within the action area are not known to support the Texas prairie dawn-flower. The nearest known occurrence of the Texas prairie-dawn flower is approximately 12 miles from the action area[47].

The Texas prairie-dawn flower would not likely occur within the action area.

Potential Effects to Texas Prairie-Dawn Flowers

The Texas prairie-dawn flower will not be directly impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance.

Since the concentrations of criteria pollutants predicted to occur as a result of the condensate splitter project are all significantly below the SILs and no potential Texas prairie-dawn flower habitat has been identified within the action area, no impacts to the Texas prairie-dawn flower are anticipated from project criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions concentrations are below TCEQ guideline levels and no emissions of mercury or other heavy metals are anticipated, no impacts to the Texas prairie-dawn flower are anticipated from project non-criteria pollutant air emissions.

All wastewater and contact stormwater associated with construction and operation of the proposed project will be treated by Gulf Coast Waste Disposal Authority and will not impact these flowers.

Since the flow velocity of non-contact stormwater would be minimized by the bull rock apron and because stormwater effluent discharged into Hunting Bayou from the condensate splitter project would reach ambient water quality conditions before it reaches the Houston Ship Channel, the Texas prairie-dawn flower will not be impacted by stormwater as a result of the proposed condensate splitter project.

Determination of Effect

The proposed action will have no effect on the Texas prairie dawn-flower.

9.8.1.11 Whooping Crane

Potential to Occur in the Action Area

Whooping cranes are migratory birds and their breeding habitat is known to be the northern US and Canada. Therefore, the consideration of potential nesting habitat was excluded from this analysis. Their wintering habitat is known to be limited to the Aransas National Wildlife Refuge near Rockport, Texas, and few other coastal counties. Therefore, the consideration of potential wintering habitat was excluded from this analysis. Potential habitat within the action area would be limited to temporary foraging and roosting habitat during migration. These cranes prefer to feed and roost in wetlands, rivers, and upland grain fields with other bird species[44].

Whooping cranes are a rare species in the wild. Only 245 individuals have been observed in Texas in 2012[74].

Habitat with the potential to support the whooping crane was not observed within the action area.

No known observations of the whooping crane in or near the action area have been found.

Open maintained or grazed pasturelands and wetlands observed within the 3-mile survey area have the potential to be a stopover location for migrating cranes. However, these fragmented areas have been impacted by surrounding industrial and residential development. Therefore, it is unlikely that whooping cranes will utilize the sites during migration.

Whooping cranes would not likely occur within the action area.

Potential Effects to Whooping Cranes

The whooping crane will not be directly impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance.

Since the concentrations of criteria pollutants predicted to occur as a result of the condensate splitter project are all significantly below the SILs and no potential whooping crane habitat has been identified within the action area, no impacts to the whooping crane are anticipated from project criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions are below TCEQ guideline levels and no emissions of mercury or other heavy

metals are anticipated, no impacts to the whooping crane are anticipated from project non-criteria pollutant air emissions.

All wastewater and contact stormwater associated with construction and operation of the proposed project will be treated by Gulf Coast Waste Disposal Authority and will not impact these cranes. Since the flow velocity of non-contact stormwater would be minimized by the bull rock apron and because stormwater effluent discharged into Hunting Bayou from the condensate splitter project would reach ambient water quality conditions before it reaches the Houston Ship Channel, the whooping crane will not be impacted by stormwater as a result of the proposed condensate splitter project.

Determination of Effect

The proposed action will have no effect on the whooping crane.

9.8.2 FEDERALLY-LISTED CANDIDATE SPECIES

9.8.2.1 Sprague's Pipit

Potential to Occur in the Action Area

Sprague's pipits are migratory birds and their breeding habitat is known to be the northern US and Canada. Therefore, the consideration of potential nesting habitat was excluded from this analysis. Potential habitat within the action area would be limited to wintering habitat (foraging and roosting). Preferred foraging habitat includes undisturbed mid-grasslands with intermediate thickness[31].

No habitat with the potential to support the Sprague's pipit was observed within the action area.

No undisturbed grasslands were identified within at least 3 miles of the action area. The habitats observed surrounding the proposed project are impacted by heavy industrial and commercial activity. USFWS critical habitat is not yet designated for this species[46]. The closest recorded observations of Sprague's pipit found occurred in the Attwater Prairie-Chicken National Wildlife Refuge (approximately 20 miles southeast of the action area)[75].

Potential foraging and roosting habitat for the Sprague's pipit was not observed within the action area or within the 3-mile survey area. Sprague's pipits would not likely occur within the action area.

Potential Effects to Sprague's Pipits

The Sprague's pipit will not be directly impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance.

Since the concentrations of criteria pollutants predicted to occur as a result of the condensate splitter project are all significantly below the SILs and no potential Sprague's pipit habitat has been identified within the action area, no impacts to the Sprague's pipit are anticipated from project criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions are below TCEQ guideline levels and no emissions of mercury or other heavy metals are anticipated, no impacts to the Sprague's pipit are anticipated from project non-criteria pollutant air emissions.

All wastewater and contact stormwater associated with construction and operation of the proposed project will be treated by Gulf Coast Waste Disposal Authority and will not impact these birds.

Since the flow velocity of non-contact stormwater would be minimized by the bull rock apron and because stormwater effluent discharged into Hunting Bayou from the condensate splitter project would reach ambient water quality conditions before it reaches the Houston Ship Channel, the Sprague's pipit will not be impacted by stormwater as a result of the proposed condensate splitter project.

10.0 CONCLUSIONS

This section is a summary of WGI's recommended determination of effect for all federally-protected species, a description of any interdependent and interrelated actions, and a description of any anticipated cumulative effects resulting from the proposed project.

10.1 DETERMINATION OF EFFECT

The recommended determinations of effect for all federally-listed threatened and endangered species with the potential to occur within habitat located within the action area (maximum radius of approximately three miles) are summarized below in Table 12.

Table 12. Determination of Effect Summary

Federally-Listed Threatened and Endangered Species	Determination of Effect
Green Sea Turtle	No Effect
Houston Toad	No Effect
Kemp's Ridley Sea Turtle	No Effect
Leatherback Sea Turtle	No Effect
Loggerhead Sea Turtle	No Effect
Louisiana Black Bear	No Effect
Red-cockaded Woodpecker	No Effect
Red Wolf	No Effect
Smalltooth Sawfish	No Effect
Texas Prairie Dawn-Flower	No Effect
Whooping Crane	No Effect

10.2 INTERDEPENDENT AND INTERRELATED ACTIONS

The proposed project includes the construction of two process trains, two pipelines within one right-of-way, and one stormwater outfall structure as outlined in Section 4.0. No additional interdependent or interrelated actions are proposed at this time.

10.3 CUMULATIVE EFFECTS

The project is located within an industrial area. Multiple industrial facilities have historically been and continue to be operational within Galena Park and Harris County, Texas. The area is likely to experience additional industrial development over time. In addition to the industrial facilities, the Houston Ship Channel is a constant source of barge and commercial vessel traffic that will continue to have an impact on the surrounding areas in the future.

As with the proposed condensate splitter project, any new proposed developments may have the potential to impact federally-protected species. However, WGI is not aware of any specific projects planned for this area at this time.

No additional actions with the potential to impact federally-protected species are planned for the GPT at this time.

10.4 CONSERVATION MEASURES

The construction of the proposed condensate splitter project will likely have no direct or indirect impact on federally-protected species habitat.

KMLT plans to utilize the BACT to the project control emissions and thus minimize impacts to the surrounding environment to the maximum extent practicable. The proposed emissions of each pollutant subject to PSD review are consistent with both the TCEQ BACT guidance and the most stringent limit in the RBLC; and, are considered to be the top level of control available for the new and modified facilities.

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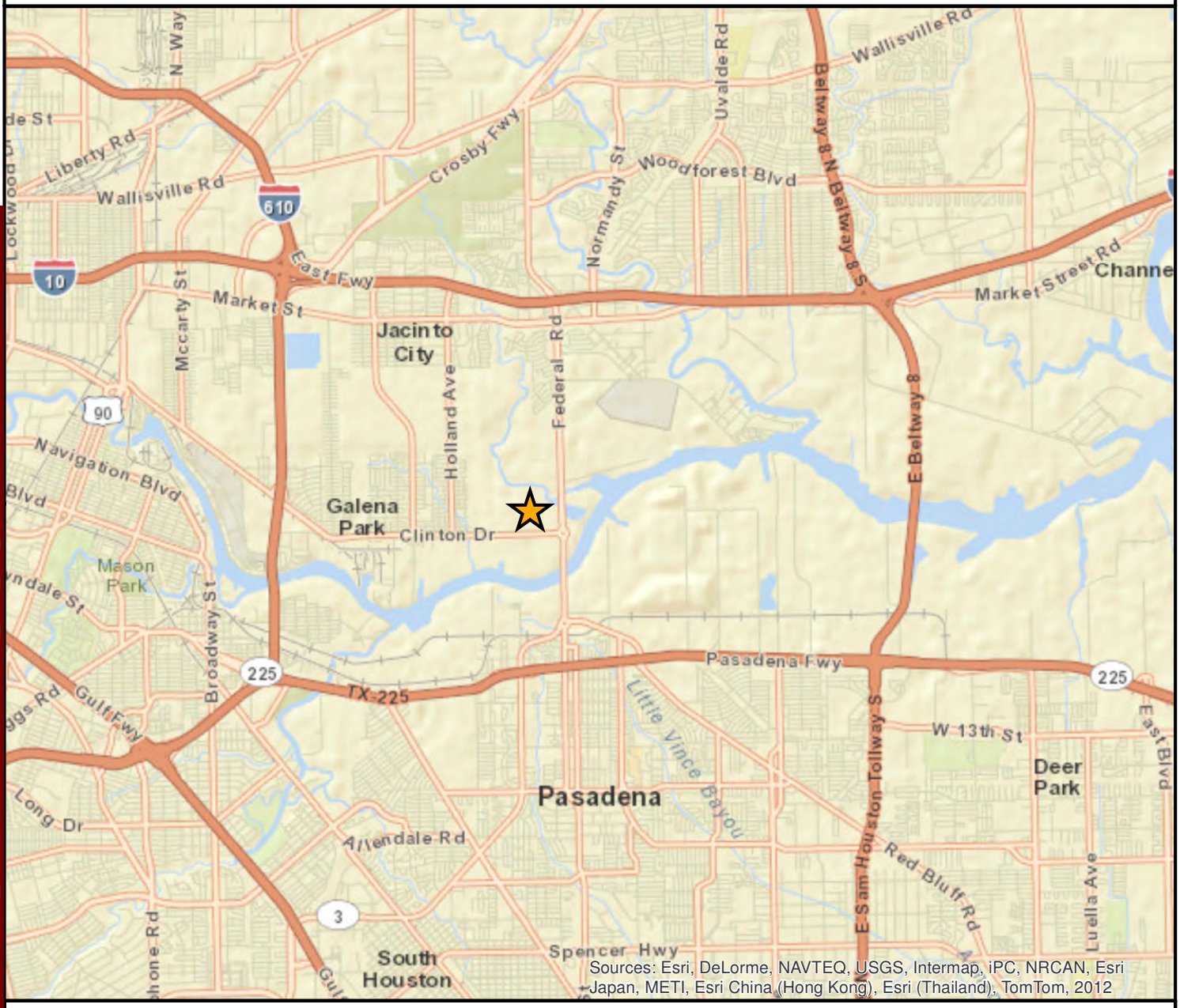
APPENDIX A

FIGURES

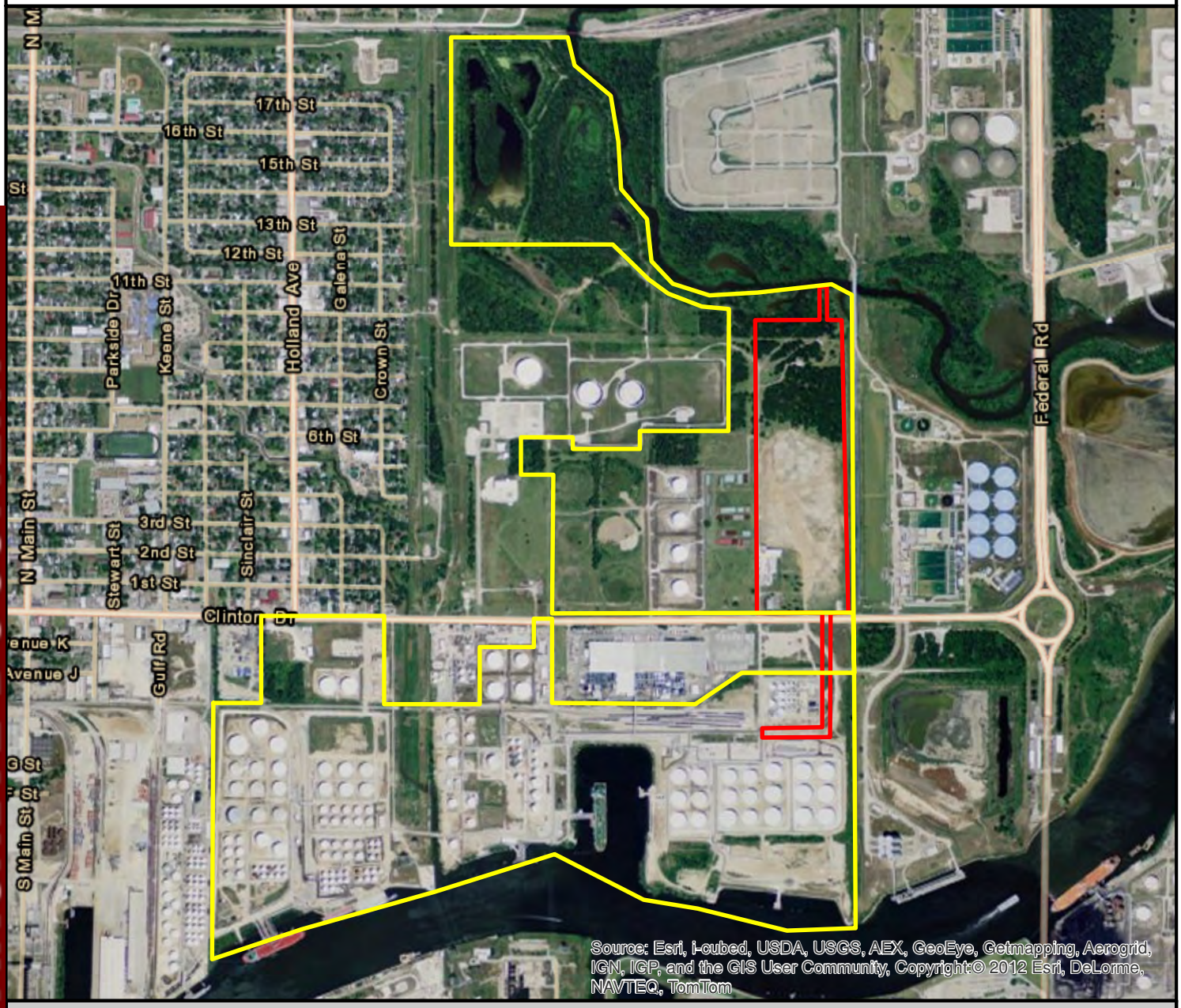
Figure 1
Project Location
Galena Park Terminal Condensate Splitter Project
Harris County, Texas



Project Location

Background Resources: USGS 100K DRG Esri USA Topo Basemap	Surveyor(s): Jayme Shiner PWS Bryan Whisenant	Project Number and Information: 1209 Galena Park Condensate Splitter Biological Assessment	WHITENTON group environmental consultants 3413 Hunter Road San Marcos Texas 78666
GPS and Coordinate Type: Trimble Geo XH 6000 Series UTM NAD 1983 Zone 15 North	Map Created: 06/03/2012 by JS Revised 2/21/2013		0 7,500 15,000 Feet N

Figure 2
Project and Action Areas - Aerial Photograph
Galena Park Condensate Splitter Project
Harris County, Texas

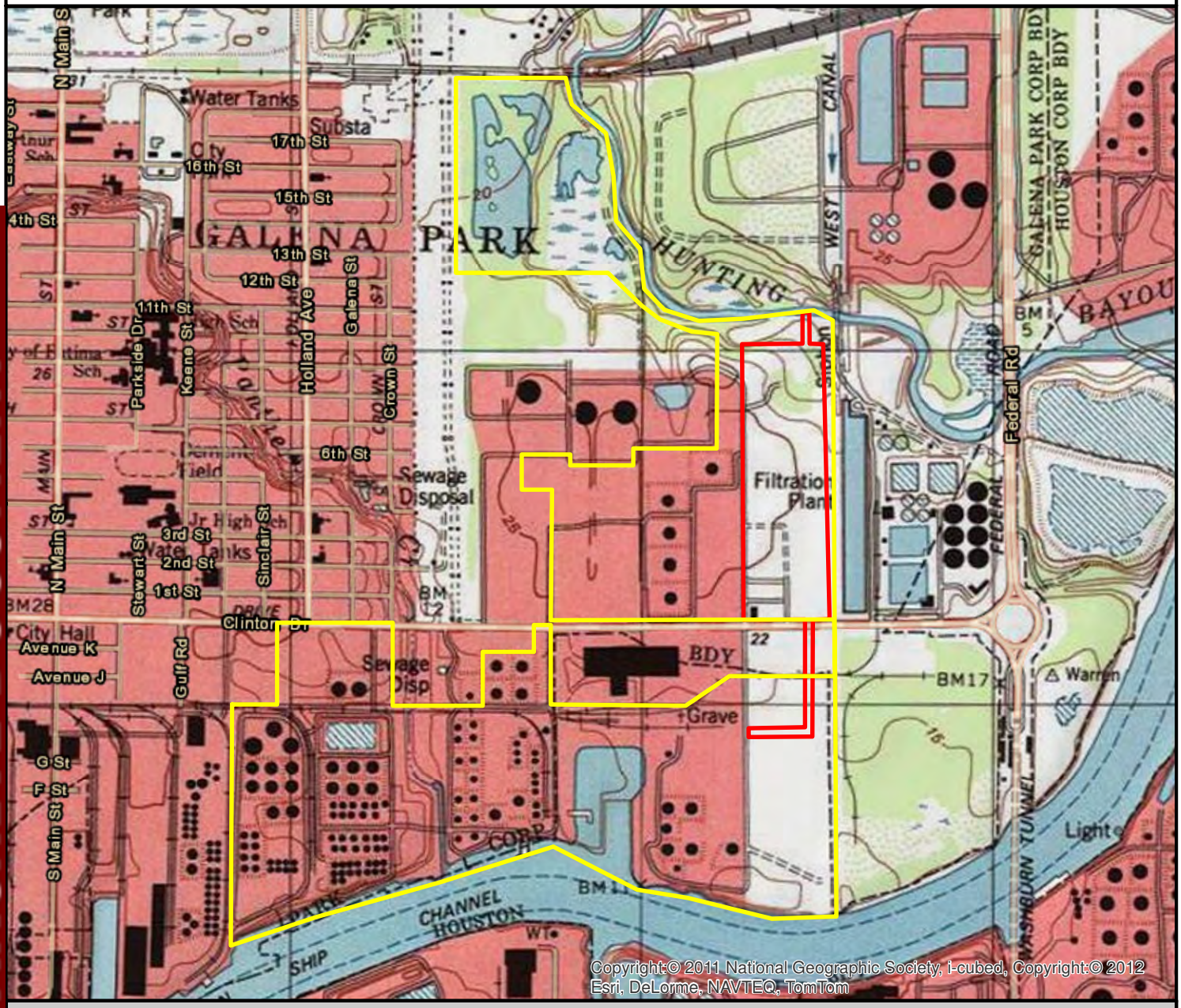


Project Area
(~49.3 Acres)

Action Area
(Maximum Radius ~0.77 mile)

Background Resources: USGS 1 Meter DOQQ (2010) Pasadena (NW) ESRI Streetmap	Surveyor(s): Jayme Shiner PWS Bryan Whisenant	Project Number and Information: 1209 Galena Park Condensate Splitter Biological Assessment	WHITENTON group environmental consultants 3413 Hunter Road San Marcos Texas 78666
GPS and Coordinate Type: Trimble Geo XH 6000 Series UTM NAD 1983 Zone 15 North	Map Created: 6/03/2012 by JS Revised 2/21/2013		0 750 1,500 Feet

Figure 3
Construction Area - Topographic Map
Galena Park Condensate Splitter Project
Harris County, Texas

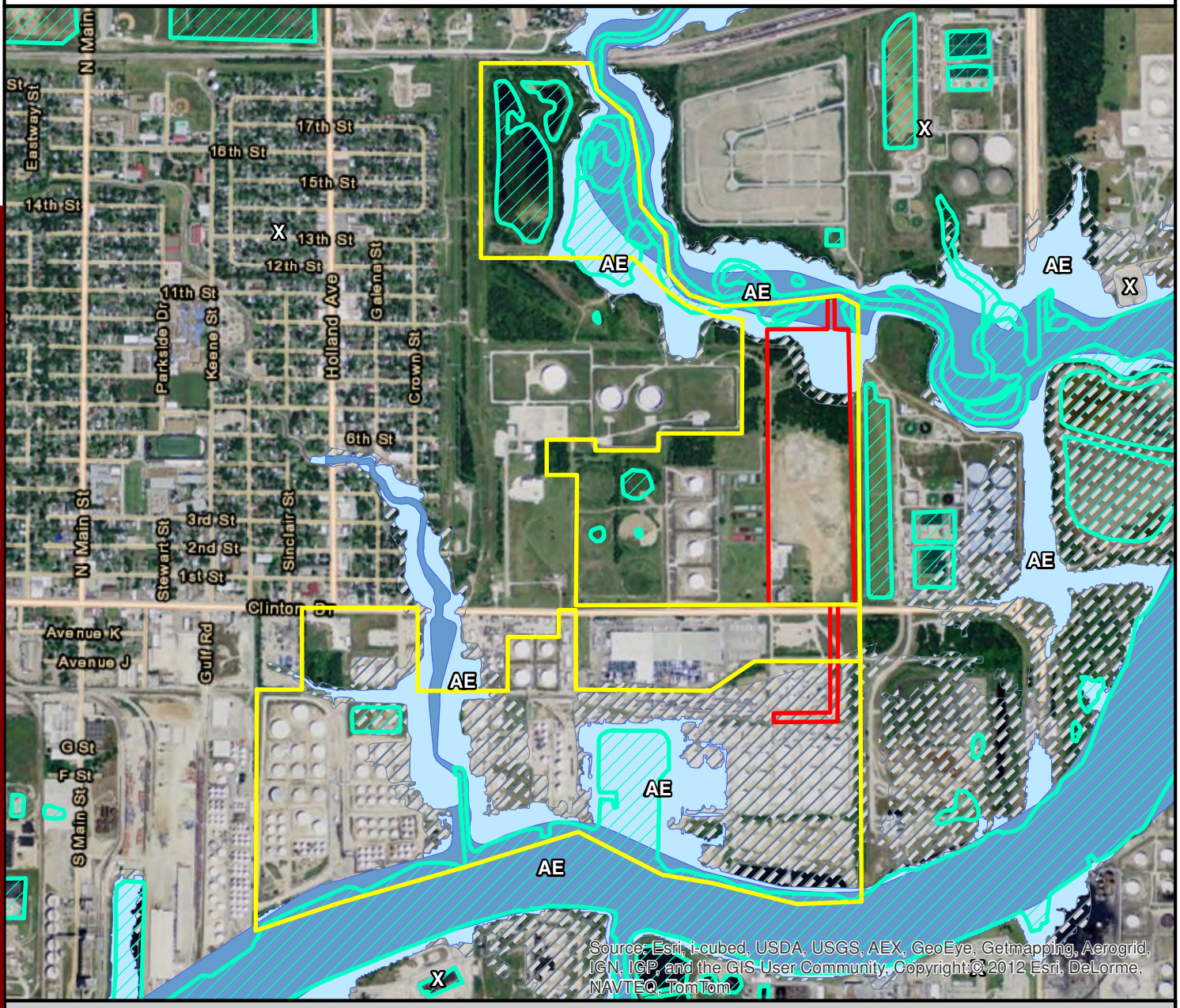


Project Area
(~49.3 Acres)

Action Area
(Maximum Radius ~0.77 mile)

Background Resources: USGS 24K DRG Pasadena ESRI Streetmap	Surveyor(s): Jayme Shiner PWS Bryan Whisenant	Project Number and Information: 1209 Galena Park Condensate Splitter Biological Assessment	WHITENTON group environmental consultants 3413 Hunter Road San Marcos Texas 78666
GPS and Coordinate Type: Trimble Geo XH 6000 Series UTM NAD 1983 Zone 15 North	Map Created: 6/03/2012 by JS Revised 2/21/2013		0 750 1,500 Feet

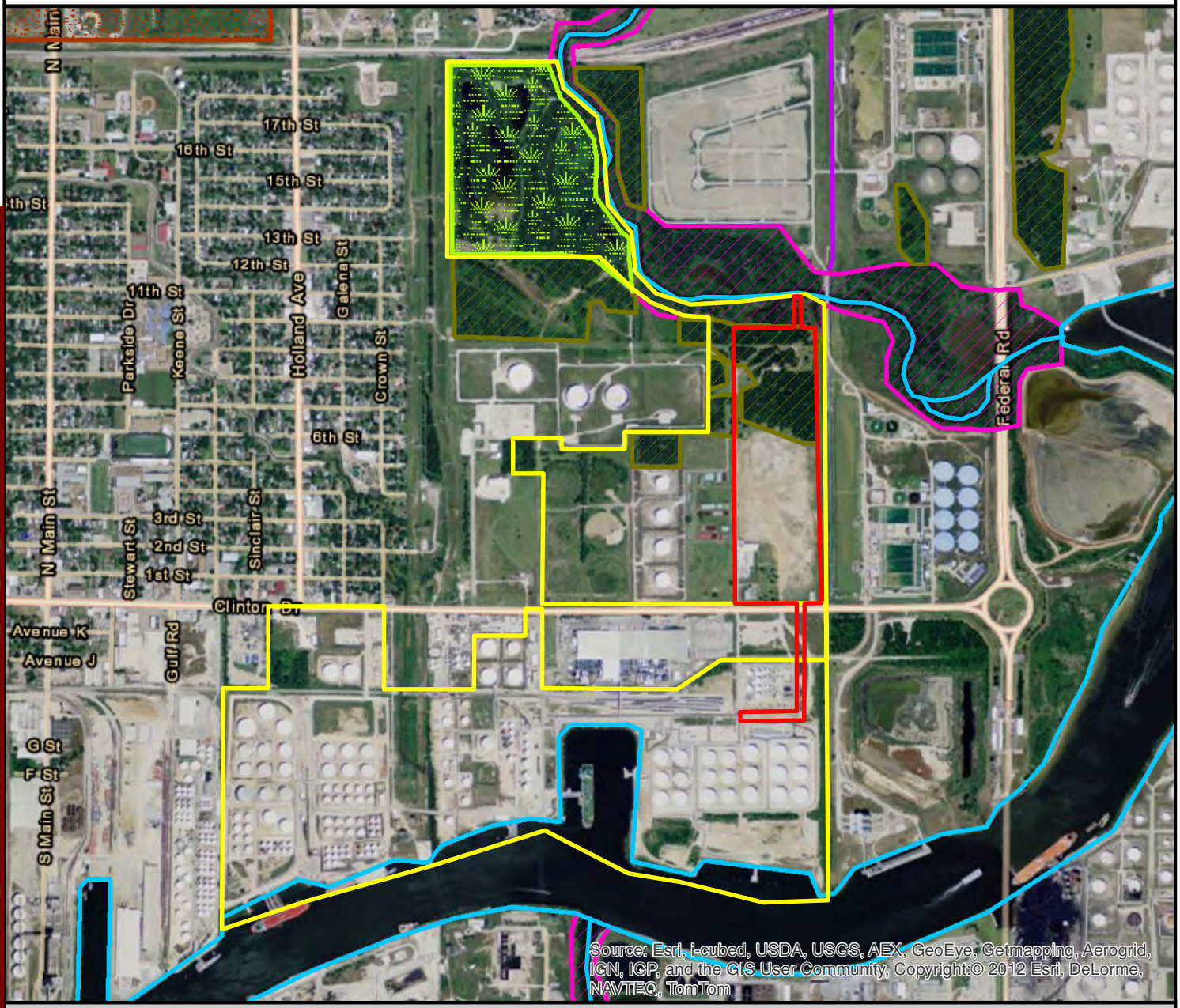
Figure 4
National Wetland Inventory and FEMA Floodplain Data
Galena Park Condensate Splitter Project
Harris County, Texas



Project Area (~49.3 Acres)	NWI Polygon	100-Year Floodplain
Action Area (Maximum Radius ~0.77 mile)	Floodway	500-Year Floodplain

Background Resources: USGS 1 Meter DOQQ (2010) Pasadena (NW) ESRI Streetmap Basemap	Surveyor(s): Jayme Shiner PWS Bryan Whisenant	Project Number and Information: 1209 Galena Park Condensate Splitter Biological Assessment	WHITENTON group environmental consultants 3413 Hunter Road San Marcos Texas 78666
GPS and Coordinate Type: Trimble Geo XH 6000 Series UTM NAD 1983 Zone 15 North	Map Created: 8/24/2012 by DS Revised 2/21/2013 by JS		0 750 1,500 Feet

Figure 5
Observed Habitats
Galena Park Condensate Splitter Project
Harris County, Texas



Project Area (~49.3 Acres)

Action Area (Maximum Radius ~0.77 mile)

Woodland Habitat

Riparian Habitat

Canal Habitat

Riverine Habitat

Wetland Habitat

Pastureland with Scattered Shrubs Habitat

Background Resources: USGS 1 Meter DOQQ (2010) Pasadena (NW) ESRI Streetmap Basemap	Surveyor(s): Jayme Shiner PWS Bryan Whisenant	Project Number and Information: 1209 Galena Park Condensate Splitter Biological Assessment	WHITENTON group environmental consultants 3413 Hunter Road San Marcos Texas 78666
GPS and Coordinate Type: Trimble Geo XH 6000 Series UTM NAD 1983 Zone 15 North	Map Created: 6/18/2012 by JS Revised 2/21/2013		0 750 1,500 Feet

APPENDIX B

FLOW DIAGRAMS

FROM T-104 JET STRIPPER SK-02

FROM T-103 HEAVY NAPHTHA STRIPPER SK-02

CONDENSATE FEED

EX-101 LIGHT NAPHTHA TO FEED PREHEATER

EX-102 HEAVY NAPHTHA TO FEED PREHEATER

EX-103 JP54 TO FEED PREHEATER

T-101 NAPHTHA STABILIZER COLUMN

AF-101 NAPHTHA STABILIZER CONDENSER

PV-101 NAPHTHA STABILIZER ACCUMULATOR

PM-101 A/B NAPHTHA STABILIZER OVERHEAD PUMPS

EX-104 NAPHTHA STABILIZER SIDE REBOILER

F-101 NAPHTHA STABILIZER REBOILER

PM-102 A/B NAPHTHA STABILIZER BOTTOMS PUMPS

AF-104 JP54 PRODUCT COOLER

JP54 PRODUCT TO STORAGE

AF-105 HEAVY NAPHTHA PRODUCT COOLER

HEAVY NAPHTHA PRODUCT TO STORAGE

AF-106 LIGHT NAPHTHA PRODUCT COOLER

LIGHT NAPHTHA TO STORAGE

AF-102 COMBI TOWER CONDENSER

Y-GRADE TO STORAGE

PV-102 COMBI TOWER ACCUMULATOR

PM-103 A/B COMBI TOWER OVERHEAD PUMPS

HEAVY NAPHTHA SIDE DRAW TO T-103 SK-02

T-103 VAPOR RETURN SK-02

JP54 SIDE DRAW TO T-104 SK-02

T-104 VAPOR RETURN SK-02

T-102 COMBI TOWER

F-102 COMBI TOWER REBOILER

FROM T-103 SK-02

SK-02 TO T-103

PM-104 A/B COMBI TOWER BOTTOMS PUMPS

FROM T-104 SK-02

SK-02 TO T-104

AF-103 DISTILLATE PRODUCT COOLER

DISTILLATE PRODUCT TO STORAGE

PRELIMINARY

DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

NO.	DATE	DRAWN	CHECKED	DESCRIPTION	APP.
REVISIONS					

DATE 01/23/12 SCALE: NONE CHECKED:
DRAWN JGM PLOT SCALE: APPROVED:

KINDER MORGAN

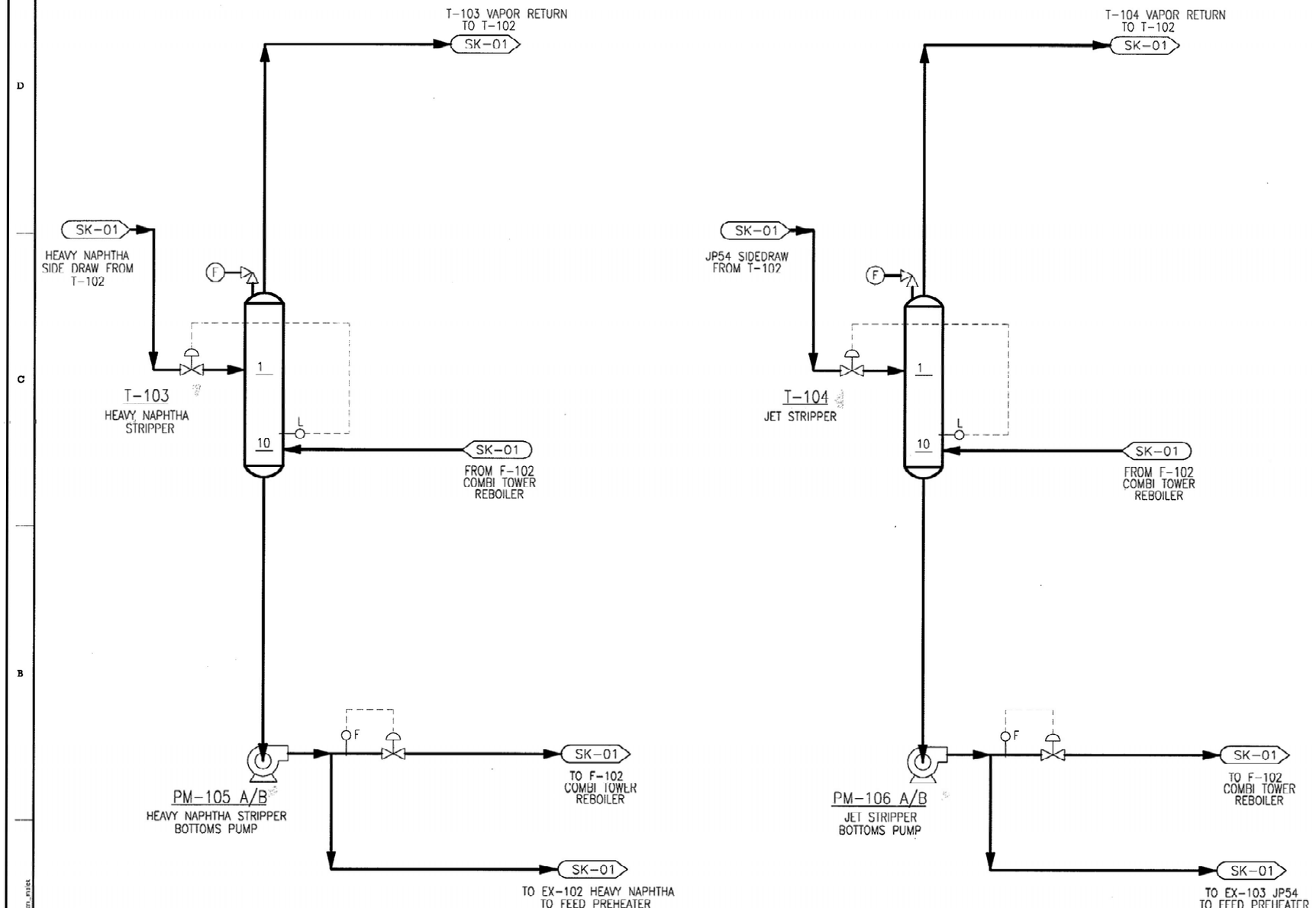
50,000 BPD
CONDENSATE FRACTIONATION
COMBI TOWER OPTION

GALENA PARK, PASADENA TEXAS

Figure 7-1
Process Flow Diagram

RPS 14450 JFK Blvd. Suite 400 Houston, Tx 77002

5552529 - F9 3K01.dwg Picked on Jan 31, 2012 by jdm_mark



PRELIMINARY

DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

3368293--PFD-SK02.dwg Plotted on: Jan 31, 2012 by jkerr_estex

NO	DATE	DRAWN	CHECKED	DESCRIPTION	APP
REVISIONS					

KINDER MORGAN

DATE: 01/23/12 SCALE: NONE CHECKED:
DRAWN: JGM PLOT SCALE: APPROVED:

50,000 BPD
CONDENSATE FRACTIONATION
COMBI TOWER OPTION
GALENA PARK, PASADENA TEXAS

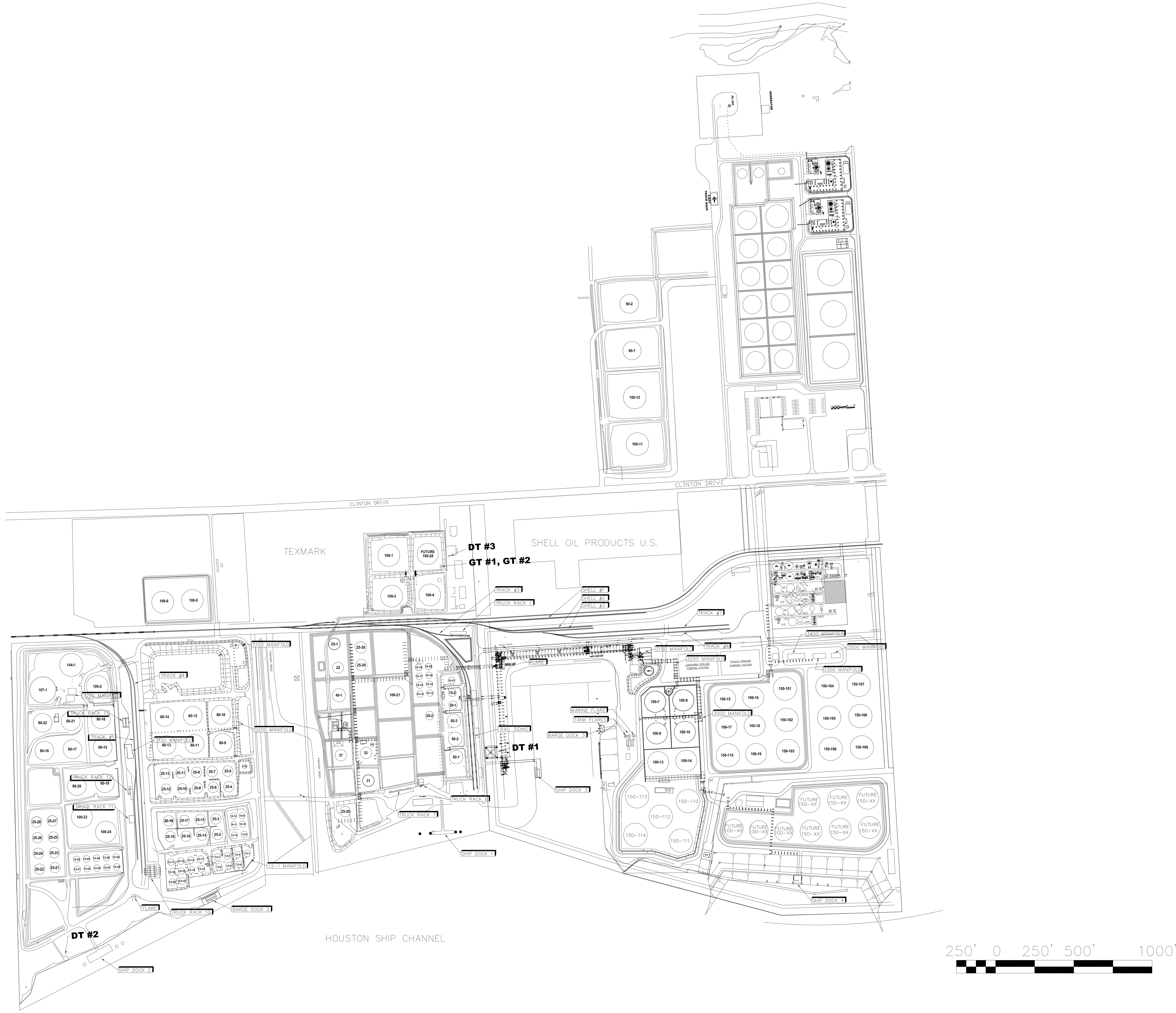
Figure 7-2
Process Flow Diagram

RPS
14450 JFK Blvd. Suite 400
Houston, Tx 77032

APPENDIX C

PLOT PLAN – 88-MS-0060

PLOT DATE: Feb 19, 2013–8:54AM



CONTRACTOR BLOCK

NOTES

DRAWING NUMBER	REFERENCE DRAWING

REV. No.	DESCRIPTION	DATE	DRAWN	CHK'D	APP'D
4	ADD BARGE DOCK 3 REV NORTH PLANT	2-19-13	SGM		
3	GENERAL UPDATES	6-13-08	JLM	JS	JS
2	RELOCATED TANKS 100-13 AND 100-14	4-27-06	SGM		
1	ADDED TANKS 100-13 AND 100-14	10-29-05	SGM		

KINDER MORGAN

DRAWN S. MARTIN
CHECKED
APPROVED PROJ. ENGR.

APPROVED REGIONAL ENGR.

GALENA PARK TERMINAL

MISCELLANEOUS

PLOT PLAN – GALENA PARK FACILITY

GENERAL ARRANGEMENT

DWG. NO. 88–MS–0060

SCALE 1" = 250' | TERMINAL 88 | DATE 9-16-03

APPENDIX D

PHOTOGRAPHIC LOG

WHITENTON group environmental consultants

PHOTOGRAPHIC LOG **1**

Galena Park Condensate Splitter Project

04/25/2012

Harris County, Texas

View: Southeast view of the proposed project area.

Galena Park Condensate Splitter Project

04/25/2012

Harris County, Texas

View: North view of the woodland habitat within the proposed project area.

Galena Park Condensate Splitter Project

04/25/2012

Harris County, Texas

View: East view of a utility line right-of-way within the proposed project area.

WHITENTON group environmental consultants

PHOTOGRAPHIC LOG 2

Galena Park Condensate Splitter Project

04/25/2012

Harris County, Texas

View: West view of Hunting Bayou (riparian and riverine habitat) near the proposed outfall structure location.

Galena Park Condensate Splitter Project

04/25/2012

Harris County, Texas

View: North view of a man-made inlet off Hunting Bayou immediately north and east of the proposed project area.

Galena Park Condensate Splitter Project

04/25/2012

Harris County, Texas

View: North aerial view of the spoil pile and woodland within the proposed project area, as well as the adjacent industrial areas.

WHITENTON group environmental consultants

PHOTOGRAPHIC LOG 3

Galena Park Condensate Splitter Project

04/25/2012

Harris County, Texas

View: Northwest view of the spoil pile, woodland, and riverine/riparian habitats within the proposed project area.

Galena Park Condensate Splitter Project

04/25/2012

Harris County, Texas

View: West view of the woodland, riparian, and riverine habitats within the proposed project area.

Galena Park Condensate Splitter Project

04/25/2012

Harris County, Texas

View: Southwest view of the proposed project area.

APPENDIX E

FIELD SURVEY DATA SUMMARY

WHITENTON group environmental consultants

Field Survey Data Summary

23 April 2012

Weather: high 90s, humid, sunny, partly cloudy, <5 mph wind

Surveyors: Jayme Shiner PWS, Bryan Whisenant

Site inspection at Galena Park Terminal in Galena Park, Texas.

Surveyed proposed project area, which is an existing industrial facility. The southern ~18 acres is an existing spoil pile, greater than 6 feet high. The northern portion of the project area (~28.5 acres) is a woodland habitat that has historically been impacted by development including utility lines, access roads, and what appear to be man-made inlets connected to Hunting Bayou. Dominant species observed within the woodland habitat included *Ulmus crassifolia*, *Triadica sebifera*, *Celtis laevigata*, *Callicarpa americana*, and *Smilax bona-nox*. Hunting Bayou is the northernmost boundary of the project area. Hunting Bayou is a shallow, tidal stream directly connected to Buffalo Bayou. One active outfall structure was observed on the north bank of Hunting Bayou outside of KMLT property. Dominant species observed within the woodland habitat included *Morella cerifera*, *Sabal minor*, *Vitis rotundifolia*, and *Smilax rotundifolia*.

The land use immediately surrounding the project area is industrial. To the northwest is what appears to be an emergent wetland adjacent to Hunting Bayou. Further to the west is residential. Further to the east and south is Buffalo Bayou/the Houston Ship Channel. Songbirds were observed within the woodland habitat. No other wildlife was observed.

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Survey continued outside the boundaries of the Galena Park Terminal. Surveyed all publicly accessible areas within a 3-mile radius.

Headed east on Clinton Drive, then north on Federal Road. Observed industrial areas, Hunting Bayou, canals, and fragmented woodlands. East on Market Street. Observed Greens Bayou. North on Normandy Street. Observed Greens Bayou and riparian areas. South on Federal Road, then west on Market Street. Observed Hunting Bayou. South on Holland. Observed pastureland with scattered shrubs (impacted/excavated). West on Clinton Drive, then north on North Main Street. Observed pastureland with scattered shrubs (impacted/excavated). West on Market Street, then south on Fidelity Street. Observed industrial and residential areas. South on East Loop Highway. Observed Buffalo Bayou. East on Lawndale Street, then south on Scarborough Lane. Observed pastureland with scattered shrubs (impacted/excavated). North on Richey Street, then east on Pasadena Freeway. Observed Vince and Little Vince Bayous. North on North South Street, then west on 1st Street. Observed industrial areas and pastureland with scattered shrubs (impacted/excavated).

Riverine. Vegetation: *Polygonum hydropiperoides*, *Campsis radicans*, *Phragmites australis*, and *Vitis rotundifolia.* Photos taken.

Riparian. Vegetation: *Celtis laevigata*, *Ligustrum japonicum*, *Fraxinus pennsylvanica*, *Morella cerifera*, *Vitis rotundifolia*, *Sabal minor*, *Ambrosia trifida*, and *Ampelopsis arborea.* Photos taken.


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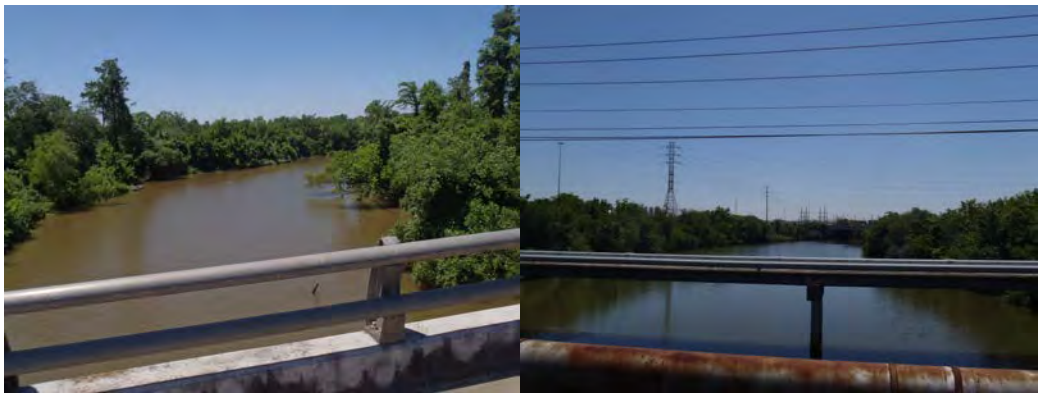

Woodland. Vegetation: *Ulmus crassifolia, Triadica sebifera, Celtis laevigata, Carex texensis, Callicarpa americana, Smilax bona-nox,* and *Vitis rotundifolia*. Aerial photographs taken.

Wetland. Vegetation: *Bacopa monnieri*, *Iva annua*, *Amaranthus tuberculatus*, *Eleocharis montevidensis*, and *Typha latifolia.*

Pastureland with scattered shrubs. Vegetation: *Cynodon dactylon*, *Ambrosia psilostachya*, and scattered *Salix nigra* shrubs. Photos taken.

Canal. Vegetation: *Cynodon dactylon.*

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Headed back to airport to begin aerial survey.

Flew in from the south at a safe altitude, but low enough to observe features and potential bald or golden eagle individuals or nests. Circled clockwise twice (one inner loop, one outer loop). Revisited wooded areas and other signatures as needed. Observed habitat types, new development not on recent aerial or satellite imagery, and land use not visible from public roadways. No bald or golden eagles or nests were observed. Photos taken from a higher altitude to demonstrate the general area. A sample of photos included below.

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APPENDIX F

TABLE 1-1

Table 1-1
NNSR/PSD Applicability Analysis Summary
KM Liquids Terminals LLC
Galena Park Terminal

EPN	Included in Construction Phase	VOC			NOx			CO			SO2			PM/PM10			PM2.5		
		Baseline	Proposed	Change	Baseline	Proposed	Change	Baseline	Proposed	Change	Baseline	Proposed	Change	Baseline	Proposed	Change	Baseline	Proposed	Change
		tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
F-101	1	-	2.43	2.43	-	2.71	2.71	-	16.67	16.67	-	2.71	2.71	-	3.36	3.36	-	2.26	2.26
F-102	1	-	1.97	1.97	-	2.19	2.19	-	13.50	13.50	-	2.19	2.19	-	2.72	2.72	-	1.83	1.83
F-201	2	-	2.43	2.43	-	2.71	2.71	-	16.67	16.67	-	2.71	2.71	-	3.36	3.36	-	2.26	2.26
F-202	2	-	1.97	1.97		2.19	2.19		13.50	13.50		2.19	2.19		2.72	2.72		1.83	1.83
FL-101	1	-	0.71	0.71	-	0.62	0.62	-	2.28	2.28	-	0.00	0.00	-	-	-	-	-	-
200-201	1	-	4.62	4.62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
200-202	1	-	4.62	4.62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
200-203	2	-	4.62	4.62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-201	1	-	1.90	1.90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-202	1	-	1.90	1.90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-209	2	-	1.90	1.90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-203	1	-	0.86	0.86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-204	1	-	0.86	0.86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-210	2	-	0.86	0.86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5-201	1	-	0.99	0.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-205	1	-	2.92	2.92	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-206	1	-	2.92	2.92	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-211	2	-	2.92	2.92	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-207	1	-	3.64	3.64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-208	1	-	3.64	3.64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-212	2	-	3.64	3.64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-201	1	-	0.04	0.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5-201	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5-202	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5-203	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5-204	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5-205	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5-206	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5-207	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG	1	-	3.88	3.88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG	2	-	3.88	3.88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAR-LOADFUG	1	-	22.32	22.32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAR-LOADFUG	2	-	22.32	22.32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAR-VCU	1	-	4.17	4.17	-	1.41	1.41	-	1.88	1.88	-	0.01	0.01	-	-	-	-	-	-
MAR-VCU	2	-	4.17	4.17	-	1.41	1.41	-	1.88	1.88	-	0.01	0.01	-	-	-	-	-	-
MSS	1	-	2.30	2.30	-	1.42	1.42	-	5.43	5.43	-	0.07	0.07	-	0.16	0.16	-	0.16	0.16
MSS	2	-	1.61	1.61	-	1.28	1.28	-	5.16	5.16	-	0.07	0.07	-	0.11	0.11	-	0.11	0.11
TNK-TRANS[1]	1	-	5.00	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phase I Project Increas (tpy)				***71.69***			***8.35***			***39.77***			***4.98***			***6.24***			***4.24***
Phase II Project Incrase (tpy)				***50.33***			***7.59***			***37.21***			***4.98***			***6.20***			***4.20***
Combined Project Increase (tpy)				***122.01***			***15.94***			***76.98***			***9.95***			***12.44***			***8.44***
Netting Threshold (tons)				***5***			***5***			***100***			***40***			***25/15***			***10***
Netting Required (Yes/No)				***Yes***			***Yes***			***No***			***No***			***No***			***No***
Contemporaneous Period Change (tons)				***> 25***			***> 25***			***-***			***-***			***-***			***-***
Significant Modification Threshold (tons)				***25***			***25***			***100***			***40***			***25/15***			***10***
Federal Revew Required (Yes/No)				***Yes***			***Yes***			***No***			***No***			***No***			***No***

Notes:
1. All of the existing Galena Park Terminal storage tanks are considered affected facilities for NNSR and PSD applicability purposes. Projected actual emission increases (i.e., storage tank working emissions) associated with additional product from the proposed condensate splitter are 5 tpy.