DOE/EA-1795

FINAL

ENVIRONMENTAL

ASSESSMENT

ENVIRONMENTAL ASSESSMENT FOR DEPARTMENT OF ENERGY LOAN GUARANTEE TO DIAMOND GREEN DIESEL, LLC FOR CONSTRUCTION OF THE DIAMOND GREEN DIESEL FACILITY IN NORCO, LOUISIANA

U.S. Department of Energy
Loan Programs Office
Washington, DC 20585

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SUMMARY

Introduction

The U.S. Department of Energy (DOE) is proposing to issue a $241 million loan guarantee to Diamond Green Diesel, LLC (Diamond) to support construction of a biomass-based diesel facility adjacent to the existing Valero St. Charles Refinery (VSCR) in Norco, Louisiana.

DOE has prepared this Environmental Assessment (EA) to comply with the National Environmental Policy Act (NEPA) (42 USC 4321, et. seq.), Council on Environmental Quality regulations for implementing NEPA (40 CFR Parts 1500-1508), and DOE Implementing Procedures (10 CFR Part 1021). The EA examines the potential environmental impacts associated with the proposed action and No Action Alternative to determine whether the proposed action has the potential for significant environmental impacts. The information contained in the EA would enable DOE to fully consider the potential environmental impacts of issuing a loan guarantee for the Diamond project.

Purpose and Need

The Energy Policy Act of 2005 (EPAct 2005) established a Federal loan guarantee program for eligible energy projects that employ innovative technologies. Title XVII of EPAct 2005 authorizes the Secretary of Energy to make loan guarantees for a variety of types of projects, including those that ‘‘avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases; and employ new or significantly improved technologies as compared to commercial technologies in service in the United States at the time the guarantee is issued.” The two principal goals of the loan guarantee program are to encourage commercial use in the United States of new or significantly improved energy-related technologies and to achieve substantial environmental benefits. The purpose and need for agency action is to comply with DOE’s mandate under EPAct 2005 by selecting eligible projects that meet the goals of the Act. DOE is using the NEPA process to assist in determining whether to issue a loan guarantee to Diamond to support the proposed project.

The Diamond facility would utilize low quality animal fats and waste grease to produce biomass-based diesel (referred to in this EA as green diesel). The proposed project is expected to result in a reduction of 1.6 million metric tons per year in equivalent carbon dioxide (CO_2 e) emissions compared to traditional fossil fuel sources of diesel generated from the petroleum refining process (see Section 3.3.2).[1] In addition, the proposed project would introduce the Ecofining™ process, which uses pretreatment to increase the conversion efficiency for low quality animal fats and waste grease, resulting in a higher value green diesel product compared to fat to diesel technology currently in use in the United States.

[1] Equivalent CO_2 is the amount of CO_2 that would produce the same radiative forcing (warming) as another greenhouse gas. It is derived by multiplying the amount of greenhouse gas by its global warming potential.

Proposed Action and Alternatives

DOE's proposed action is to issue a loan guarantee to Diamond to support the construction of the green diesel facility. The proposed facility would produce up to approximately 10,920 barrels per day (bpd) (167 million gallons per year (MGY)) of green diesel using up to approximately 12,332 bpd (189 MGY or 1.8 billion pounds per year (lbs/yr)) of renewable biomass feedstock (animal fats and waste grease). The refining process would also generate two green fuel co-products: light ends gas (a fuel gas stream) and Liquid Petroleum Gas (LPG)/naphtha (a mix of liquid hydrocarbons). The Diamond facility would be constructed on an approximately 20-acre site adjacent to and interconnected with the existing VSCR in Norco, Louisiana. The project would also include construction of a new elevated pipe rack, a new rail spur and railcar scale, and use of an approximately 23-acre site for parking and laydown during the construction phase. The project site and the site for use during construction have been used by VSCR for laydown, construction, and staging for approximately three years and two years, respectively.

A No Action Alternative is also evaluated in this EA. Under the No Action Alternative, DOE would not issue the loan guarantee to Diamond for the project. Without the DOE loan, it is unlikely that Diamond would implement the project as currently planned. Thus, the No Action Alternative is that no green diesel facility would be constructed at the project site.

The decision for DOE consideration presented in this EA is whether or not to approve the loan guarantee for the proposed Diamond facility. Prior to submitting its application, Diamond considered alternative sites. Siting the Diamond project adjacent to an existing refinery would provide optimum use of existing infrastructure, reduce the need for new construction, and allow access to the highly skilled labor base already in place in the surrounding community for both construction and operation phases. Diamond determined that the VSCR site, which offered previously disturbed industrial lands that have already been graded and filled, was the most viable site for the project.

Summary of Resource Areas Examined

The EA evaluates the environmental effects that could result from implementing the proposed action and No Action Alternative. Table S.1 provides a summary of the potential environmental consequences that could result from implementing the proposed action and from the No Action Alternative.

Table S.1
Summary of Impacts by Resource

Resource Area	No Action Alternative	Proposed Action
Land Use/Visual Resources	The plant site and off-site laydown yard would continue to be used for staging and storage and there would be no impacts to land use.	The proposed project would be located in an existing petrochemical complex area that is already zoned industrial. Construction of the proposed project would not substantially change the land use or pose conflicts with existing or future planned land use or the character of the visual resources.
Air Quality	The project would not be constructed and there would be no additional emissions; however, the local, regional, and national benefits of reduced greenhouse gas (GHG) emissions from renewable sources of fuel would not be realized.	The proposed project site is in an area that is designated in attainment with all National Ambient Air Quality Standards (NAAQS). The proposed project would result in temporary increases in emissions of particulates and fuel exhaust during the construction phase, commencing in 2011 and ending in 2012. Emissions that would result from operation of the proposed project are below the Prevention of significant Deterioration (PSD) significance thresholds; therefore, the project is a minor modification under PSD. In addition, the project would utilize air emission control equipment to minimize emissions. Based on the low levels of emissions, air quality impacts are expected to be minor.

Resource Area	No Action Alternative	Proposed Action
Air Quality (continued)		A life cycle impact analysis of the effect of the proposed project on GHG emissions shows a reduction of 1.6 million metric tons per year of CO_2e emissions compared to the No Action Alternative (continued production of petroleum-based diesel).
Noise	There would be no change in existing noise levels.	Construction noise may cause a temporary increase in ambient noise levels. Construction workers would follow Occupational Health and Safety Administration (OSHA) guidelines for hearing protection. Minor increases in sound from construction and operation are not expected to impact sensitive receivers.
Geology and Soils	There would be no change in existing conditions and no impacts to geology and soils.	There are no unique geological features in the area of impact. No impacts to geology and soils are anticipated.
Water Resources	There would be no change in existing surface or groundwater resources and no impacts to wetlands or floodplain in the surrounding region.	Construction would be designed to avoid any impacts to groundwater, and best management practices would be used to minimize any impacts to surface waters. Construction of the green diesel plant and use of the existing offsite laydown and parking area would not impact wetlands. Construction of the piperack, rail spur and scale would result in permanent impacts to 4.5 acres of wetlands which would be compensated for as part of the required permit.

Resource Area	No Action Alternative	Proposed Action
Water Resources (continued)		The plant site is within the 100-year floodplain. No adverse impacts on the floodplain's storage volume are anticipated and no significant increase in flood elevations on adjacent properties is expected due to the proposed project.
Biological Resources	There would be no changes in the existing conditions and no impacts to biological resources.	The proposed site, offsite laydown yard, and rail spur have all been previously impacted by industrial use or clearing; therefore, impacts to vegetation and wildlife would be minimal. No threatened and endangered species or critical habitat has been identified as occurring in the proposed project.
Cultural Resources	There would be no change in existing conditions and no impacts to cultural resources.	No cultural resources or historic properties are known to occur on or in close proximity to the proposed site. No impacts are expected.
Socioeconomics and Environmental Justice	There would be no change in existing conditions and no new construction or operation jobs would be created.	Construction is expected to provide temporary jobs for up to 630 people during peak periods. Operation of the proposed project would provide permanent jobs for 52 workers on site. All workers for both construction and operations are expected to come from the surrounding communities and are not expected to place an undue burden on surrounding housing resources or community infrastructure. No disproportionately high and adverse impacts to the health of or environment affecting

Resource Area	No Action Alternative	Proposed Action
		low-income or minority populations would occur.
Utilities	There would be no change in existing conditions and utilities would not be provided to the proposed site.	The proposed project would require a minor increase in electricity of 4 MW that has been approved by Entergy Utilities. Natural gas and potable water would be supplied via the piperack from the VSCR and are not expected to impact existing capacity. Wastewater would be pretreated and then sent to the VSCR via the piperack and is not expected to impact existing treatment capacity at the VSCR WWTP.
Transportation	There would be no change in existing traffic conditions.	The proposed project would have up to 630 workers traveling to and from the off-site parking lot/laydown yard during construction and up to 52 permanent workers traveling to and from the site during operation. Both increases would represent less than 4% of existing average daily traffic counts between the off-site laydown yard and the site and are expected to have negligible impacts.
Waste Management	There would be no change in existing conditions.	Construction of the proposed project is expected to generate approximately 1,694 tons of construction and demolition waste. Operations are expected to generate 19,383 tons per year of non-hazardous industrial solid waste. Sufficient landfill capacity exists in the area to accommodate disposal of the

Resource Area	No Action Alternative	Proposed Action
Waste Management (continued)		solid waste. All waste hauling would be done by licensed firms and all off-site recycling and disposal would occur in accordance with State and Federal regulations.
Public and Occupational Health and Safety	There would be no change in existing conditions and no impacts to public and occupational health and safety.	Construction workers are subject to typical hazards and occupational exposures faced at other industrial construction sites. The facility is an unlikely target for intentionally destructive acts. Protective services would be sufficient to handle needs of additional population. All process material hazards are comparable to those managed routinely by the existing VSCR. All activities during construction and operation of the proposed project would comply with OSHA requirements, reducing potential impacts to workers and the public.
Cumulative Impacts	There would be no change in existing conditions and no cumulative impacts.	The cumulative contribution of impacts that the proposed action would make on the various environmental resources is expected to be minor.

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LIST OF ABBREVIATIONS AND ACRONYMS

%	Percent
µg/m^3	micrograms per cubic meter
bgs	below ground surface
bpd	barrels per day
BOD	biochemical oxygen demand
Btu	British Thermal Unit
CAA	Clean Air Act
CFR	Code of Federal Regulations
CH_4	Methane
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2e	Equivalent carbon dioxide
COD	Chemical oxygen demand
Darling	Darling International, Inc.
dBA	Decibels
DCS	Distributed Control System
Desmet	Desmet Ballestra Group
Diamond	Diamond Green Diesel LLC
DOE	Department of Energy
EPAct 2005	Energy Policy Act of 2005
EO	Executive Order
ER	Environmental Report
ESA	Endangered Species Act
FAME	Fatty acid methyl esters
FEMA	Federal Emergency Management Agency
FFA	Free fatty acid
FIRMs	Flood Insurance Rate Maps
ft	Feet
GHG	Greenhouse gas
gpm	gallons per minute
gpd	gallons per day
gpy	gallons per year
in	inches
IPCC	Intergovernmental Panel on Climate Change
KCSRC	Kansas City Southern Railroad Company
lbs	pounds
LAC	Louisiana Administrative Code
LDEQ	Louisiana Department of Environmental Quality
LDNR	Louisiana Department of Natural Resources
LNHP	Louisiana Natural Heritage Program
LPDES	Louisiana Pollutant Discharge Elimination System

LPG	liquid petroleum gas
MGY	million gallons per year
MGD	million gallons per day
mi	miles
MCF	Thousand cubic feet
MMBtu	Million Btu
MTSA	Marine Transportation Security Act
MW	MegaWatt
MWH	MegaWatt Hour
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
N_2O	Nitrous oxide
NO_2	Nitrogen dioxide
NO_X	Nitrogen oxides
NRCS	National Resources Conservation Service
NWI	National Wetland Inventory
O_3	Ozone
OSHA	Occupational Safety and Health Administration
Pb	Lead
PDFIRMs	Preliminary Digital Flood Insurance Rate Maps
PM	Particulate matter
PM2.5	PM with an aerodynamic diameter of 2.5 microns or less
PM10	PM with an aerodynamic diameter of 10 microns or less
ppm	parts per million
PSD	Prevention of Significant Deterioration
PSM	Process Safety Management
SIP	State Implementation Plan
SO_2	Sulfur dioxide
Solicitation	U.S. Department of Energy Solicitation Number DE-FOA-0000140
SSURGO	Soil Survey Geographic Database
SWPPP	Storm Water Pollution Prevention Plan
TSS	Total suspended solids
UOP	UOP, Inc.
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
Valero	Valero Energy Corporation
VOC	Volatile organic compound
VSCR	Valero St. Charles Refinery
WWTP	Waste Water Treatment plant

CHAPTER 1 - PURPOSE AND NEED

1.1 Purpose and Need for Agency Action

The proposed action evaluated by the U.S. Department of Energy (DOE) in this environmental assessment (EA) is to issue a $241 million loan guarantee to Diamond Green Diesel, LLC (Diamond) to support construction of a biomass-based diesel (referred to in this EA as green diesel) facility adjacent to the existing Valero St. Charles Refinery (VSCR) in Norco, Louisiana. Diamond is a joint venture formed by Diamond Alternative Energy, LLC (a wholly owned subsidiary of Valero Energy Corporation) and Darling International Inc. (Darling).

The Energy Policy Act of 2005 (EPAct 2005) established a Federal loan guarantee program for eligible energy projects that employ innovative technologies. Title XVII of EPAct 2005 authorizes the Secretary of Energy to make loan guarantees for a variety of types of projects, including those that ‘‘avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases; and employ new or significantly improved technologies as compared to commercial technologies in service in the United States at the time the guarantee is issued.” The two principal goals of the loan guarantee program are to encourage commercial use in the United States of new or significantly improved energy-related technologies and to achieve substantial environmental benefits. The purpose and need for agency action is to comply with DOE’s mandate under EPAct 2005 by selecting eligible projects that meet the goals of the Act. DOE is using the NEPA process to assist in determining whether to issue a loan guarantee to Diamond to support the proposed project.

The Diamond project would produce up to approximately 10,920 barrels per day (bpd) (167 million gallons per year (MGY)) of green diesel using up to approximately 12,332 bpd (189 MGY or 1.8 billion pounds per year (lbs/yr)) of renewable biomass feedstock (animal fats and waste grease). The refining process would also generate two fuel co-products: light ends gas (a fuel gas stream) and Liquid Petroleum Gas (LPG)/naphtha (a mix of liquid hydrocarbons). All products, including the green diesel, light ends gas, and LPG/naphtha, would be sold and transferred directly to VSCR via a new elevated pipe rack and blended with refinery product streams for sale to distributors and consumers.

The Diamond Green Diesel product is compatible with the existing national transport infrastructure, is expected to result in a reduction in greenhouse gas (GHG) emissions compared to petroleum diesel (see Section 3.3, Table 3.9), and is expected to result in significant improvements in productivity compared to commercial technology currently used in the U.S.

The proposed project would introduce the Ecofining™ process, which uses pretreatment to increase the conversion efficiency for low quality animal fats and waste grease. The main advantage of the new technology chosen for the green diesel project is its flexibility to process low cost renewable biomass feedstocks, including those that contain high proportions of free fatty acid (FFA), or those which

are highly saturated and have poor cold flow properties (such as cloud point or pour point) into a high quality biomass-based diesel product that would be fungible with petroleum products without quality or compatibility issues. Thus, low quality feedstocks could be economically processed into biomass-based diesel all year long. Transesterification technology, which involves the conversion of triglycerides into fatty acid methyl esters (FAME), is the baseline commercial technology in use in the U.S. to convert fats and oils to diesel fuel. The Ecofining™ process, when combined with the pretreatment process, represents a substantial improvement for all feedstocks and is essential for the conversion of more saturated/high FFA feedstocks. The value of the product from the Ecofining™ process is substantially higher than that of FAME because it is entirely compatible with existing industry infrastructure, which allows distribution and use at higher concentrations without contamination of fuel lines. As a result, the green diesel project would broaden feedstock sources for the production of, and thus the U.S. supply of, biomass-based diesel by allowing saturated and lower quality fats and oils to be converted to high quality diesel fuel.

1.2 Background

EPAct 2005 established a Federal loan guarantee program for eligible energy projects that employ innovative technologies. The two principal goals of the program are to encourage commercial use in the United States of new or significantly improved energy related technologies and to achieve substantial environmental benefits. DOE believes that commercial use of these technologies would help sustain and promote economic growth, produce a more stable and secure energy supply and economy for the United States, and improve the environment. DOE published a Final Rule that establishes the policies, procedures, and requirements for the loan guarantee program (10 Code of Federal Regulations (CFR) Part 609). Title XVII of EPAct 2005 was amended by Section 406 of the American Recovery and Reinvestment Act of 2009 (42 U.S.C. 16516) to create Section 1705 authorizing a new program for rapid deployment of renewable energy and electric power transmission projects.

In July 2009, DOE issued a solicitation announcement inviting interested parties to submit proposals for projects that employ energy efficiency, renewable energy, and advanced transmission and distribution technologies that constitute New or Significantly Improved Technologies (as defined in 10 CFR Part 609). The Diamond green diesel project qualifies as a stand-alone, biomass project for consideration in the DOE loan guarantee program as detailed in DOE Solicitation DE-FOA-0000140 and is eligible under the Section 1705 program. Part I of the application was submitted to DOE on September 14, 2009, and Part II of the application was submitted on December 4, 2009.

The green diesel plant would be built adjacent to and interconnected with the existing VSCR. VSCR, owned and operated by Valero Refining – New Orleans, L.L.C., is a 1,000-acre petroleum refinery located in Norco, St. Charles Parish, Louisiana. VSCR is an integrated crude operation (high conversion) that includes crude

distillation, catalytic reforming, catalytic cracking, hydrocracking, alkylation, coking, and sulfur recovery processing units. VSCR product capabilities include gasoline, diesel, distillates, and sulfur as well as by-products such as petroleum coke. The VSCR currently employs approximately 530 people and has a capacity of approximately 250,000 bpd of output.

1.3 Scope of Environmental Assessment

This EA presents information on the potential impacts associated with guaranteeing a loan to Diamond and covers the construction and operation of the completed green diesel facility. DOE has prepared this EA to comply with the National Environmental Policy Act of 1969 (NEPA), Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR Parts 1500−1508), and DOE NEPA Implementing Procedures (10 CFR Part 1021). If no significant impacts are identified during preparation of this EA, DOE would issue a Finding of No Significant Impact (FONSI). If potentially significant impacts are identified, DOE would prepare an environmental impact statement (EIS).

This EA: (1) describes the affected environment relevant to the impacts of the proposed action and No Action Alternative; (2) describes the proposed action; (3) analyzes environmental impacts associated with the proposed action and No Action Alternative; and (4) identifies and characterizes cumulative impacts that could result from the proposed action in relation to other ongoing or proposed activities within the surrounding area.

This EA has been organized into the following sections and supporting appendices:

- Section 1.0, Purpose and Need: This section describes the purpose of and need for the proposed DOE action and the scope of the EA.

- Section 2.0, Proposed Action and Alternatives: This section describes the location of the project and provides a description of the green diesel manufacturing process. It also describes the alternative sites considered.

- Section 3.0, Existing Environment and Environmental Effects: This section discusses the existing environment and the effects of the project in the areas of land use, geology, soils, topography and drainage, ecological resources, water resources, air quality, waste management, socioeconomic conditions, and cultural resources, as well as potential cumulative effects that may be associated with the project.

- Section 4.0, List of Agencies Contacted: This section lists Federal, state, and local agencies contacted during preparation of the EA.

- Section 5.0, List of Preparers: This section lists the individuals responsible for developing this EA and provides a brief description of their credentials.

- Section 6.0, References: This section lists the references used in preparing this EA.

- Supporting Appendix.

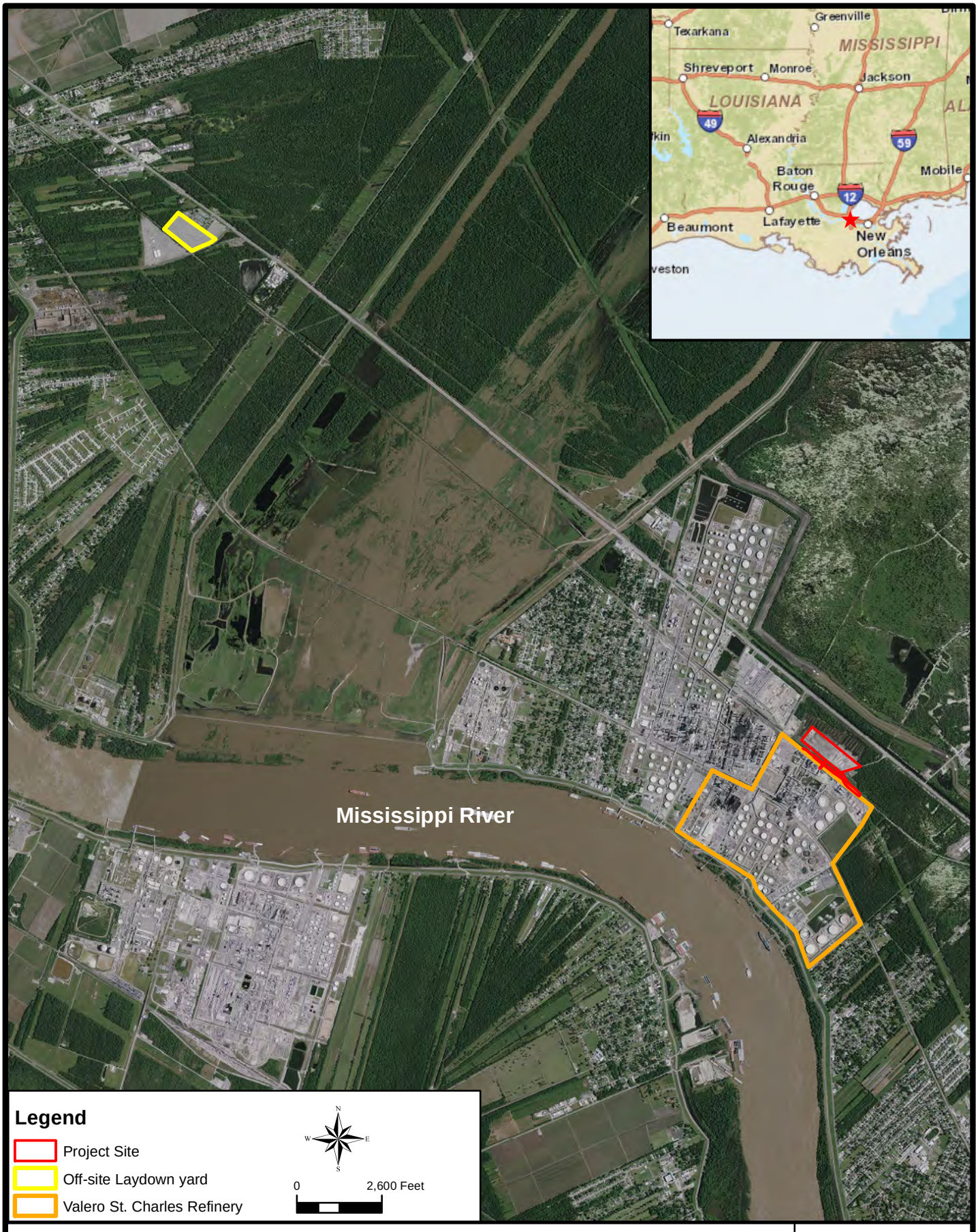
2 CHAPTER 2 - DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

DOE's proposed action is to issue a loan guarantee to Diamond to support construction of a green diesel facility adjacent to the existing VSCR in Norco, Louisiana. The proposed facility would produce approximately 10,920 bpd (167 MGY) of green diesel from renewable biomass feedstock (animal fats and waste grease).

2.1 Diamond Green Diesel Project Description

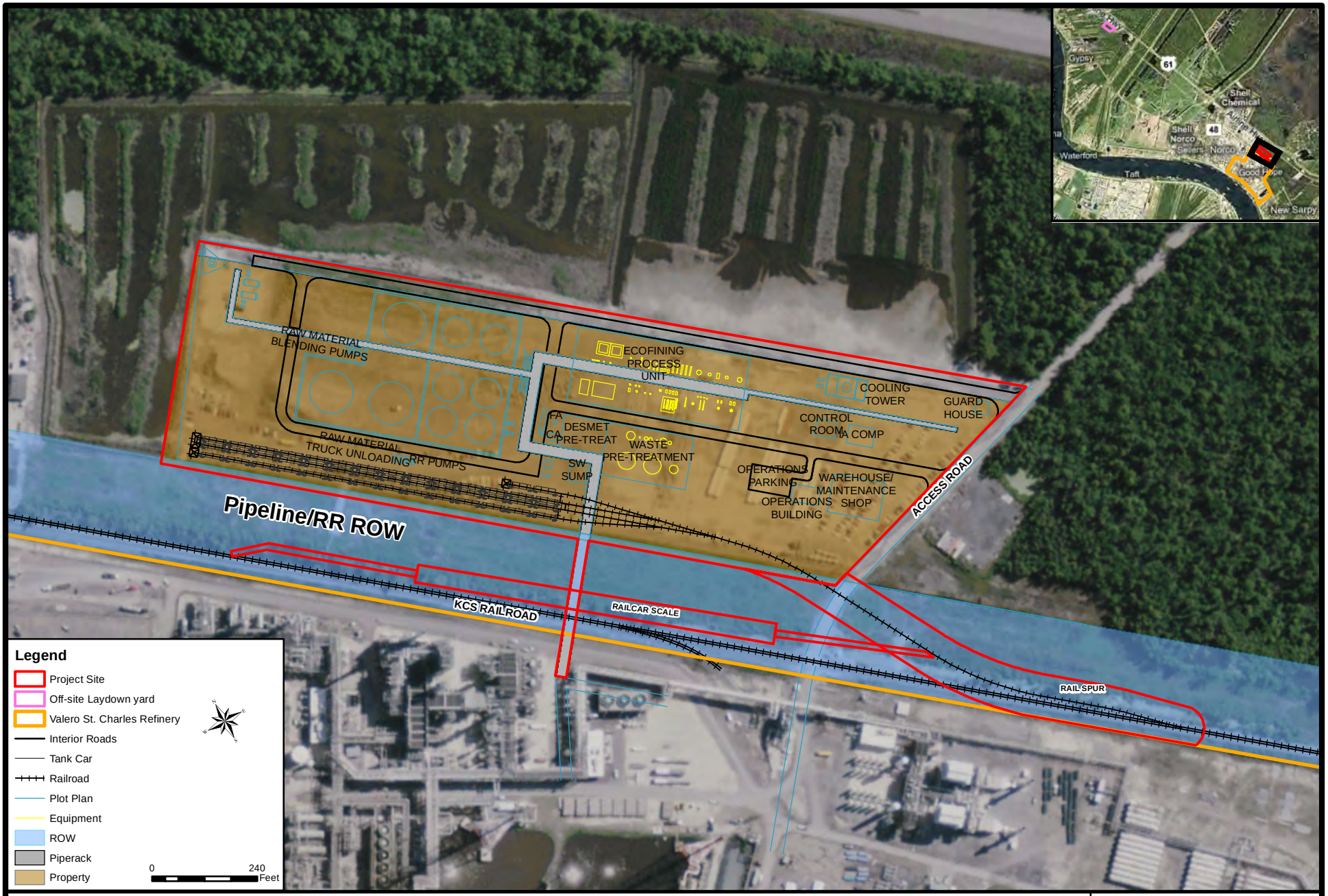
The Diamond green diesel project is an industrial biomass-based diesel manufacturing plant that would be built adjacent to and interconnected with the existing VSCR in Norco, Louisiana. The green diesel project would receive renewable biomass waste fats and grease from animals and used cooking oils, as well as other renewable biomass fats such as algae and jatropha (i.e., a genus of succulent plants), and convert them into a high quality and fungible green diesel. Fuel co-products of the refining process would include light ends gas and LPG/naphtha.

The proposed green diesel project would be located approximately 20 miles upriver from New Orleans, Louisiana, in Norco, St. Charles Parish (Figures 2.1 and 2.2). The Diamond project would be built adjacent to, but interconnected with, the existing VSCR. The site has been used by VSCR for laydown, construction, and staging for approximately three years.



Site Map
Diamond Green Diesel Project
Norco, LA

Figure
2.1



Site Details
Diamond Green Diesel Project
Norco, LA

Figure
2.2

The green diesel project site is bounded on the northwest and southwest by petroleum refining and chemical process units, including the existing VSCR to the southwest. The site is bounded on the northeast and southeast by undeveloped property. Access is provided by US Highway 61, also known as Airline Highway, which runs from the northwest to the southeast approximately 600 feet (ft) northeast of the site. Access to the green diesel project site is provided by an existing paved access road that extends south from Airline Highway along the southeastern perimeter of the site. The total project would be comprised of the following portions (pictured in Figure 2.3):

- The main project site of approximately 20 acres (ac), consisting of an existing parking and laydown area that was cleared, filled, and graded pursuant to a 2005 U.S. Army Corps of Engineers (USACE) permit, would house the green diesel plant, including the receiving and storage areas, the pretreatment process area, the Ecofining™ process area, the flare, cooling tower, control room, Instrument Air Compressor building, warehouse and maintenance shop, operations building, employee parking, and interior access roads.

- A new elevated piperack would be constructed for transporting materials to and from VSCR (see section 2.1.5). The elevated piperack would originate within the 20-acre green diesel plant, extend over property owned by Valero where third-party underground pipelines and the Kansas City Southern Railway Company (KCSRC) railroad are located, and tie into an existing VSCR elevated piperack within the VSCR. One footing of the elevated piperack may be located within the identified wetland area, with a nominal footprint of approximately 50 square feet.

- A new rail spur would be constructed to connect the KCSRC railroad, which runs parallel to the southern boundary of the plant site, to the green diesel plant unloading area, where sidings for railcar unloading would be constructed (Figure 2.2). The spur would originate from a tie-in point to the southeast of the plant site and would extend diagonally to the northwest, traversing the Valero-owned strip of property that houses the KCSRC right-of-way and 3rd party pipeline easements, entering the green diesel plant site at the southeastern corner. The new rail spur would cover approximately 3.4 acres. In addition, a new railcar scale would be constructed running parallel to and alongside the existing KCSRC railroad south of the green diesel project site, covering an estimated 1.1 acres within the existing KCSRC right-of-way. The scale would be used to weigh cars just before entering the plant (Figure 2.2).

- During the construction phase, Diamond would utilize an existing offsite laydown area of approximately 23 acres for parking, staging, and laydown. This area is depicted on Figure 2.1 and is located approximately 2 miles (mi) northwest of the construction site along Airline Highway, near the intersection of Airline Highway and Highway 3217, in St. John the Baptist Parish. The area

has been in use by Valero for parking and laydown since it was purchased in 2008 and is cleared, filled, graded and covered with limestone gravel.

Figure 2.3
Site Photographs

Picture 1: Twenty acre plant site (looking across site towards Valero St. Charles Refinery).

Picture 2: Twenty acre plant site.

Picture 3: Twenty three acre temporary construction lay down and parking area.

Picture 4: Right-of-way between proposed plant site and Valero St. Charles Refinery. KSRC railroad runs along the left side.

Process Design Basis

The green diesel project would require construction of new equipment to support the production of green diesel and co-products (light ends gas and LPG/naphtha). A green diesel plant, including process equipment as well as support facilities, would be constructed at the project site.

As discussed in Section 2.1.3, Bounding Case for Environmental Analysis, for purposes of the environmental impacts analysis, the process design is assumed to be the upper bound of the potential production capacity of the Ecofining™ process, which is greater than the "nameplate" design basis for the facility. The process design basis for the Bounding Case used in this EA is shown in Table 2.1.

Table 2.1

Bounding Case Process Design Basis

Raw Material or Feed	Daily Throughput	Annual Throughput
Raw Material (fats and oils)	12,332 barrels	4,501,180 barrels
Bleaching Earth	77,381 lbs	28,244,187 lbs
Filter Aid	7,738 lbs	2,824,419 lbs
Citric Acid (50%)	26,220 lbs	9,570,243 lbs
Ecofining™ (Intermediate) Feed	12,000 barrels	4,380,000 barrels
Product	**Daily Throughput**	**Annual Throughput**
Green Diesel Product	10,920 barrels	3,985,800 barrels
Light Ends Gas	1.34 million standard cubic feet (MMscf)	489.1 MMscf
LPG/Naphtha	1,310 barrels	478,150 barrels

The two main components of the proposed process include a pre-treatment process designed by the Desmet Ballestra Group (Desmet) and the subsequent hydrotreating/isomerization process referred to as Ecofining™, designed by UOP, Inc. (UOP), a division of Honeywell. An overview of each process is provided below in Sections 2.1.1 and 2.1.2.

In addition to the process facilities for the pretreatment and Ecofining™ steps of the production process, additional support facilities would be required by the Diamond green diesel project, which are described in more detail in Section 2.1.4.

Equipment that would be constructed is listed and described in Table 2.2.

Table 2.2
Green Diesel Project Equipment, Purpose, Inputs, and Outputs

Equipment Description	Purpose	Input	Output
Railroad Spur, Scale, and 4 Rail Sidings	Receipt and unloading of raw materials and pretreatment materials	Fats, oils, bleaching earth (clay), filter aid or citric acid	Fats, oils, bleaching earth, filter aid or citric acid
Truck Unloading Station	Receipt and unloading of raw materials	Fats and oils	Fats and oils
Truck Unloading Station	Receipt and unloading of pretreatment materials	Filter Aid and citric acid	Filter Aid and citric acid
Pneumatic conveyance system	Unloading and transfer of pretreatment materials	Bleaching earth and filter aid	Bleaching earth and filter aid
2 Receiving Silos	Storage of pretreatment materials	Bleaching earth and filter aid	Bleaching earth and filter aid
3 raw material storage tanks, 50,000 barrels each (T-101, T-102, T-103) and associated feed pumps	Storage of raw fats and oils as received	Fats and oils	Fats and oils
3 raw material blend storage tanks, 30,000 barrels each (T-104, T-105, T-106) and associated feed pumps	Blending and storage of raw materials to achieve homogeneous blends prior to pretreatment	Fats and oils	Fats and oils
1 Citric Acid Tank, < 100 barrel capacity (4,200 gallons)	Storage of citric acid	50% citric acid solution	50% citric acid solution
Pretreatment process vessels, including: hot water tank, acid and caustic dosing vessels, hydration tank, soapstock	Pretreatment of blended fats and oils to prepare for Ecofining™ Process, as	Blended fats and oils from blend tanks	Intermediate (pretreated) feedstock material to Intermediate Tanks for

Equipment Description	Purpose	Input	Output
container, and degummed oil tank – each vessel less than 100 barrel in capacity (4,200 gallons)	described in following sections		Ecofining™ Process
Pretreatment feedstock heaters, centrifuge, and filter system	Pretreatment of blended fats and oils to prepare for Ecofining™ Process, as described in following sections	Blended fats and oils from blend tanks	Intermediate (pretreated) feedstock material to Intermediate Tanks for Ecofining™ Process
Pretreatment hydration tank, less than 450 barrel capacity (18,900 gallons)	Pretreatment of blended fats and oils to prepare for Ecofining™ Process, as described in following sections	Blended fats and oils from blend tanks	Intermediate (pretreated) feedstock material to Intermediate Tanks for Ecofining™ Process
3 Intermediate Feed Tanks, 30,000 barrels each (T-107, T-108, T-109), and associated feed pumps	Storage of intermediate (pretreated) feedstock and feed to Ecofining™ Process	Pretreated feedstock from Desmet Pretreatment Process	Pretreated feedstock from Desmet Pretreatment Process
Fresh feed pump, recycle product pump and recycle gas compressor	Combine fresh feed with recycled product and recycled gas to redistribute heat	Fresh feed (Intermediate), recycled product (from Enhanced Hot Separator) and recycled gas	First Stage Reactor feed
First Stage Feed Heater	Heat First Stage Reactor feed	First Stage Reactor feed; Natural gas as fuel	First Stage Reactor feed
First Stage Reactor Guard Bed	Remove additional phosphorous and mineral impurities from pretreated feed to protect First Stage Catalyst	First Stage Reactor feed	First Stage Reactor feed
First Stage Reactor (Deoxygenation)	Convert triglycerides and free fatty acids into straight chain diesel-range paraffins,	First Stage Reactor feed	Straight chain diesel-range paraffins, propane

Equipment Description	Purpose	Input	Output
	propane and butane		and butane, water and CO_2
Enhanced Hot Separator	Separate hydrogen and lighter components from heavier liquid components (straight chain diesel-range paraffins)	Effluent from First Stage Reactor and Overhead from Isomerization Effluent Separator	Overhead: Hydrogen and lighter end components to Cold Separator Bottoms: Process oil stream, including straight chain diesel-range paraffins (Isom Feed)
Isom Feed Heater	Heat Isomerization Reactor Feed	Isom Feed; Natural gas as fuel	Isom (Second Stage Reactor) Feed
Second Stage Reactor (Isomerization)	Isomerize straight chain diesel-range paraffins to produce branched chain molecules	Bottoms from Enhanced Hot Separator, enhanced with fresh hydrogen from Make-up Hydrogen Compressor	Mixed product stream, water and hydrogen
Isomerization Effluent Separator	Separate a hydrogen-rich gas stream from the second stage reactor effluent	Second Stage Reactor effluent mixed product stream	Overhead: Hydrogen-rich stream sent to Enhanced Hot Separator Bottoms: Mixed product stream sent to Cold Separator
Cold Separator	Separate mixed product stream into liquid product stream, water and hydrogen/CO_2	Bottoms from Isomerization Effluent Separator and Overhead from Enhanced	Liquid organic product stream to Product

Equipment Description	Purpose	Input	Output
	gas stream	Hot Separator	Separator Water to Isomerization Effluent Separator Overhead gas stream (H_2, CO_2, other low level impurities) to Amine Scrubber
Amine Scrubber	Separate hydrogen-rich gas stream from gas stream feed	Overhead gas phase (hydrogen rich) from Cold Separator, and lean amine as scrubbing medium	Recycled hydrogen gas to First Stage Reactor Rich amine stream to VSCR Sulfur Recovery Unit
Product Stripper and associated dryer	Separate green diesel product from lighter co-products	Liquid organic product effluent stream from Cold Separator	Overhead: Mixed light ends and LPG/naphtha stream to Stripper Condenser Bottoms: Liquid green diesel to dryer, then to VSCR via pipe
Stripper Condenser	Separate light ends gas from LPG/naphtha	Overhead stream from Product Stripper	Overhead: light ends gas Product to VSCR via pipe Bottoms: LPG/naphtha Product stream to VSCR

Equipment Description	Purpose	Input	Output
			via pipe
Cooling tower	Provide water for cooling in the Ecofining™ Process	Water	Water
Flare and associated knock-out and seal drums	Control of emissions by combustion, for use during startup, shutdown, and any malfunction, process upset or emergency	Process overhead gases	Emissions that are the product of combustion of gases, including NO_x, SO_2, CO, PM_{10}, and Volatile organic compounds (VOCs)
Wastewater treatment, including oil/water separator and Dissolved Air Flotation device , and conveyance equipment	Pretreatment of process wastewater and conveyance of wastewater from process areas	Wastewater streams off of process areas	Pretreated wastewater to VSCR wastewater treatment plant (WWTP)
Make-up Hydrogen Compressor	Compress hydrogen and send to Second Stage Reactor, combined with bottoms from Enhanced Hot Separator	Hydrogen from VSCR	Hydrogen to Second Stage Reactor

2.1.1 Desmet Pretreatment Process

Incoming feedstock (e.g., animal fats and waste grease) is processed through a pre-treatment process based on a conventional vegetable oil refining process, adapted by Desmet to accommodate animal fats and used cooking oils. There are three steps in the pre-treatment process including: 1) de-gumming; 2) washing; and 3) bleaching. The purpose of the pre-treatment process is to remove contaminants (primarily phosphorus and other elements) that could interfere with the hydrotreating and isomerization catalysts of the Ecofining^{TM} Unit.

In the first step of pretreatment or de-gumming, water is added to the raw material (fats and oils) in an agitating vessel to disperse it in the oil. Most of the phospholipids (i.e., fat molecules containing a phosphate group instead of a carboxyl group) are hydrated and made insoluble in the oil. Then, the hydrated phospholipids (gums) can be separated from the oil phase in a high speed centrifuge, along with any solid impurities that have a higher density than fat. The use of citric acid further advances the hydration of certain phospholipids.

In the washing or second step, water addition and centrifugation completes the removal of remaining traces of water soluble impurities.

In the third or final step of the pre-treatment process, remaining traces of gums, non-hydratable phospholipids, and other trace impurities are removed by adsorption with bleaching earth (clay). The degummed oil is combined with bleaching earth in an agitating vessel followed by application of a vacuum, which dries the mixture by opening the pores in the clay and making them available for removal of the aforementioned impurities. The oil is recovered by simple filtration with filter aid (diatomaceous earth), which removes filterable impurities, hence completing the pretreatment process. The pretreated material is then stored in intermediate oil tanks and, after appropriate quality tests, fed to the Ecofining^{TM} unit.

2.1.2 *Ecofining^{TM}* Process

The Ecofining^{TM} process is a technology that is capable of deoxygenating and then isomerizing a wide variety of triglyceride (vegetable oil, algae oil, or tallow) sources to make an isomerized diesel-range paraffin product known as green diesel or renewable diesel.

The Ecofining™ process is comprised of three primary steps: 1) deoxygenation; 2) isomerization; and, 3) product separation. To prepare the feedstock for the First Stage Reactor, or deoxygenation step, intermediate oil is processed through the First Stage Guard Bed, removing minerals, such as calcium, magnesium and phosphorus, from the biomass feedstock to protect the First Stage Reactor catalyst. The bulk of these minerals are removed in the pretreatment step, however a small fraction makes it through the process. These minerals can deactivate the primary hydrotreating catalyst over time and result in shorter cycle lengths. The First Stage

Guard Bed catalyst would selectively capture these contaminants. The fresh feed is then combined with recycled product oil from the Enhanced Hot Separator, and recycled gas from the recycle compressor. The recycled product assists to redistribute heat within the exothermic First Stage Reactor. Working through the First Stage feed heat exchange system, the reactor charge enters the top of the First Stage Reactor, which is a fixed bed down-flow design. The First Stage Reactor uses UOP's proprietary reactor internals distribution system to ensure optimal liquid and gas distribution across the top of the catalyst bed. At the top of the bed, UOP uses commercially proven demetallization catalysts and graded bed material before redistributing and passing the reactor charge over the main First Stage catalyst.

The First Stage catalyst deoxygenates the First Stage feed in an exothermic reaction, breaking the triglyceride structure into three straight chain diesel-range paraffins, producing propane and butane as co-products, together with water and CO_2 from the oxygen molecules present in the feed. Free fatty acid molecules are similarly de-oxygenated, to create straight chain paraffins with water and CO_2 by-products.

To prepare the de-oxygenated product stream for the Second Stage Reactor, or isomerization step, First Stage Reactor effluent is cooled and then enters the Enhanced Hot Separator. The Enhanced Hot Separator uses hydrogen-rich gas from the Isomerization Effluent Separator for stripping, roughly separating lighter components, including hydrogen, from the heavier liquid components and sends the lighter stream overhead to the Cold Separator. Bottoms from the Enhanced Hot Separator are pumped as feed to the inlet of the Second Stage Reactor, with a portion of the bottoms diverted either as recycled oil to the first stage or as quench (i.e. a cooling agent) to the first stage to enhance the deoxygenation process. Prior to entering the Second Stage Reactor, Enhanced Hot Separator bottoms are first combined with fresh, high purity make-up hydrogen from the Make-up Hydrogen Compressor, and heated to the correct operating temperature via feed/effluent exchange and the Isom Feed Heater.

The Second Stage Reactor is a fixed bed down-flow configuration utilizing UOP reactor internals for distribution. Reactor charge passes over the isomerization catalyst, where the straight chain diesel-range paraffins are isomerized to branched chains, enhancing the cold flow and cloud point of the diesel. Exiting the Second Stage Reactor, the effluent is cooled, and then enters the Isomerization Effluent Separator to begin the product separation step.

Product separation is accomplished through four stages: Isomerization Effluent Separator, Cold Separator; Product Stripper, and Stripper Condenser. In the Isomerization Effluent Separator, a portion of the hydrogen-rich gas is separated from the Second Stage Reactor effluent and sent to the Enhanced Hot Separator for stripping purposes; the remaining gas and the liquid products continue on to the Cold Separator.

At the Cold Separator, three fractions are formed: a gas phase, a water phase, and a liquid hydrocarbon phase. The hydrogen- and CO_2-rich gas stream is treated with amine scrubbing technology to remove CO_2, H_2S and other impurities, and the resulting recycled hydrogen is compressed and sent to the First Stage Reactor. The rich amine stream from the amine scrubber, containing H_2S that can be concentrated for recovery of sulfur, is routed to the VSCR Sulfur Recovery Unit. Water from the deoxygenation reaction in the Cold Separator is collected in a boot and pumped away for VSCR water treatment. Within the Cold Separator, the main liquid hydrocarbon product stream comprised of green diesel, light ends gas, and LPG/naphtha, is separated and sent to the Product Stripper.

At the Product Stripper, the green diesel is separated from the mixed product stream, taken from the bottom of the stripper, and sent to VSCR via pipeline. The remaining lighter mixed product stream is sent to the Stripper Condenser.

At the Stripper Condenser, the lighter mixed product stream is separated into a light ends gas stream and an LPG/naphtha stream. These product streams are routed to VSCR via pipe.

2.1.3 Bounding Case for Environmental Analysis

The “nameplate” design capacity of the green diesel plant is 10,000 barrels per day (bpd) of Ecofining™ feed (intermediate oils). There is a reasonable possibility that the facility would be able to achieve a greater production capacity with the processing equipment as sized in the design. Should that be the case, Diamond would want to utilize the full capacity of the facility. A reasonable maximum potential capacity of the as-built facility has been estimated at 12,000 bpd Ecofining™ feed, with a resulting 10,920 bpd green diesel production.

Given the potential for greater than nameplate capacity production, the maximum projected potential capacity (12,000 bpd of Ecofining™ feed) is the bounding case for most aspects of the environmental impact analyses in this environmental assessment and was used for development of the air permit. This bounding case is used to estimate throughputs of raw materials, pretreatment materials, and all product throughputs, as well as waste volumes (see Table 2.1). Notably, construction materials and footprint are not affected, since the bounding case represents only increased production from the same facility as the base case, not an increase in any equipment size. Also, this bounding case is used to estimate the environmental benefits of reduced GHG emissions associated with the displacement of petroleum based diesel, with the comparison made on a fuel energy equivalent basis.

2.1.4 New Support Facilities

In addition to the processing facilities described above for the pretreatment and Ecofining™ steps of the green diesel manufacturing process, additional support facilities would also be constructed for the Diamond green diesel project that are

described in more detail below. Support facilities and utilities that would be provided by existing facilities and infrastructure are discussed separately in Section 2.1.5.

Receiving and Storage Area

A receiving area for unloading raw material would be constructed in the southwestern portion of the site. The receiving area would include four new railroad sidings, including three sidings of approximately 800 ft. each and a fourth siding of approximately 250 ft., which would be tied into the existing KCSRC tracks to the southeast of the green diesel plant site. The tie-in spur would be approximately 1,000 ft. in length. It would originate from the KCSRC railroad to the southeast of the site, traverse Valero-owned property diagonally to the northwest, and enter the Green Diesel Project site at the southeast corner. The property the main spur would cross includes several existing 3rd-party underground pipelines for which Valero has granted easements and the KCSRC right-of-way. In addition, a new railroad scale of approximately 1,000 ft. would be constructed alongside the existing KCSRC railroad to the south of the green diesel plant site, to weigh railcars just before delivery of material to the plant. The railroad scale would be located within the KCSRC right-of-way. The right-of-way and pipeline easement area must be cleared and cut periodically for pipeline maintenance, aerial inspections, and KCSRC access.

A truck unloading area would be located just north of the sidings and would be used to unload raw material arriving by truck via the existing interstate and U.S. highway system. Raw feed material (fats and oils) would be pumped from either rail cars or trucks and transferred to the feed storage area into three storage tanks with an approximate capacity of 50,000 barrels each. Bleaching earth and filter aid would also be received by rail car and would be transferred via a pneumatic conveyance system to the receiving silos. Citric acid may also be received via rail car and would be unloaded by pump to the citric acid tank.

A second truck unloading station would be constructed in the center of the green diesel plant site near the pretreatment area. Filter aid and citric acid would be received via truck deliveries at this station and would be unloaded to the filter aid receiving silo and citric acid tank, respectively.

Although not currently planned as part of the proposed project, it is possible that in the future Diamond would want to receive raw materials by marine vessel. Raw material for the green diesel refining process can include plant and vegetable oils for which there is not currently a viable supply. As the production of green fuels grows, it is anticipated that a supply would be established for these oils and they could become readily available and economically viable for the Diamond green diesel project. If such a supply develops, oils may be imported or domestically available via marine transport. These materials would be received over existing VSCR river docks and transported via pipe across the existing refinery footprint to the green diesel plant. No additional land would be developed, since the pipeline would traverse the existing refinery and be carried across the proposed piperack.

Cooling Tower

A cooling tower with a circulation rate of 3,500 gpm would be constructed in the northern portion of the site, to the east of the Ecofining™ process. The cooling tower would utilize make-up water supplied by VSCR via pipe (~106 gpm) and would be equipped with a drift eliminator to minimize water loss and emissions of particulate entrained in the cooling tower mist.

Flare

A flare would be constructed in the northwest corner of the site. The flare would be a derrick style with a stack height approximately 150 ft high and 24 inches (in) in diameter. The flare would be used primarily for combustion of gases during plant startup and in the event of upset or emergency. A pilot would burn continuously. Also, it is anticipated that the flare may receive some minor routine vents, such as analyzer vents and sample stations.

Wastewater Pretreatment Facilities

A wastewater treatment facility would be constructed for pretreating wastewater off of the raw material pretreatment process prior to routing the wastewater to the VSCR WWTP. The wastewater pretreatment unit would include a Dissolved Air Flotation (DAF) device and a biological treatment unit. The wastewater treatment equipment would be located east of the raw material pretreatment process in the central portion of the site.

Guard House, Instrument Air Compressor Building, and Control Room

A small guard house would be located in the northeastern corner of the site to manage access to the facility. Also in the northeast portion of the site, the Instrument Air Compressor building and a control room would be constructed.

Warehouse / Maintenance Shop, Operations Building and Parking Lot

The warehouse/maintenance shop and operations buildings would be located in the southeastern portion of the project site adjacent to the access road. These buildings would be used for support operations. A parking lot for employees such as operators and shift supervisors that monitor the function of the process units would be located to the west of these buildings.

Plant Roads

Interior plant roads would be constructed within the boundaries of the new green diesel plant site to accommodate vehicles for plant operations. All interior roads would be paved and contained within the 20-acre footprint of the green diesel plant site and no additional new roads outside that footprint would be required.

Piperack for Interconnections with VSCR

A new elevated piperack would be constructed to carry pipes transporting materials between the green diesel plant and VSCR. As depicted in Figure 2.2, the piperack

would run from the central distribution center within the green diesel plant, would extend over property owned by Valero where third-party underground pipelines and the KCSRC railroad are located, and would tie into an existing VSCR elevated piperack in the northern portion of VSCR.

2.1.5 Integration with Existing Support and Utilities

The green diesel project would be located adjacent to the existing VSCR, which would allow for integration with existing support and utilities. Materials and electric power would be transported between the green diesel plant and VSCR via the newly constructed elevated piperack. The facilities would be well integrated to maximize efficiency and utilize the infrastructure already in place, thereby significantly reducing project impacts as compared to siting the project at a remote location. The integration would require the construction of several tie-ins from the piperack to existing VSCR infrastructure.

It is anticipated that VSCR would supply the following material resources and support services to the green diesel plant via pipe:

- lean amine for the amine scrubber;
- natural gas as fuel to the flare pilot and process heaters;
- medium pressure (150#) steam to support start up;
- nitrogen for nitrogen sweep of storage tanks to minimize oxidation;
- hydrogen;
- caustic (50%) for the pretreatment process; and
- water.

The green diesel project would receive power as a direct customer from the local utility company, Entergy, via an existing substation located at the adjacent VSCR. A cable connection would be installed from the substation to the green diesel plant. The cable would be supported by the elevated piperack that would tie-in with the existing VSCR.

The green diesel plant would also send a number of different streams out to VSCR in addition to product streams, for use, reuse, recovery or waste treatment. Material streams going out from the green diesel plant across the piperack to VSCR would include:

- green diesel, light ends gas, and LPG/naphtha;
- rich amine and sour water for sulfur recovery;
- hydrogen purge gas for recovery of hydrogen;
- process wastewater and storm water collected from process areas for wastewater treatment and discharge;

- sanitary wastewater for tie in to sewerage pipeline transport to Destrehan Wastewater Treatment Plant;
- medium pressure steam produced by recovering heat from the exothermic First Stage Reactor;
- blowdown and startup (off-spec) diesel to the VSCR slop tank; and
- low pressure condensate for recovery and re-use in steam production.

2.1.6 Construction

Materials and Equipment to be Used in Construction

The green diesel project would be constructed primarily of concrete and steel, using high quality construction materials meeting all applicable safety and engineering specifications. To set the required foundations and erect the required structures, contractors would utilize heavy construction equipment which would typically be fossil-fuel driven. The following table provides a listing of the construction materials that would be used and the estimated quantities required.

Table 2.3
Material Resources for Construction of the Green Diesel Project

Construction Material	Estimated Quantity
Steel	2,282,836 lbs
Concrete Foundation	11,000 cubic yards (yd^3)
Concrete Piles	3,586, each 14 in^2 x 70'
Concrete Paving	100,000 square feet (ft^2), 6 in depth
Fill Soil	62,746 yd^3
Pipe	174,000 linear ft, various diameters and steel grade
Asphalt	135,000 ft^2

Construction materials would be transported by truck along existing major interstate, federal, and state roadways that provide access to the site or by rail along existing railways. Diamond would utilize an existing parking and laydown area approximately 2 miles from the green diesel plant site along Airline Highway as a laydown, storage, and staging area. From the laydown area, trucks would transport material via Airline Highway to the existing unnamed paved access road to the green diesel plant site.

An average of 300 contracted construction workers would be on the job during construction, with approximately 630 construction workers at the peak phase.

Construction workers would access the site via the same major highways and park at the offsite location. From the offsite parking area, buses would transport workers to the green diesel plant site.

Site Clearing and Excavation

The 20-acre green diesel plant site was previously cleared, filled, and graded under USACE Permit # MVN 2005-775 EE for use as a parking and laydown area. Mitigation of prior wetlands at this site was also provided under the USACE permit. No additional land clearing would be required. Grading and some fill of the site would be needed. Construction would involve the setting of approximately 3,500 concrete piles for foundation. It is estimated that approximately 62,750 yd^3 of fill soil would be used during the construction of the green diesel project.

The off-site laydown yard that would be used to temporarily store construction materials and support construction worker parking has also already been cleared and graded and is currently in use by Valero for similar purposes. The offsite laydown area would require minor clearing of debris and stored materials prior to starting construction.

2.2 No Action Alternative

Under the No Action Alternative, DOE would not issue the loan guarantee to Diamond for the project. Without the DOE loan, it is unlikely that Diamond would implement the project as currently planned. Thus, the No Action Alternative is that no green diesel facility would be constructed at the project site and the planned green diesel, light ends gas, and LPG/naphtha would not be produced. Ongoing petroleum-based refining activities would continue at the existing VSCR. No offset of GHG emissions resulting from introduction of the Diamond green diesel and other products into the marketplace would occur.

2.3 Alternatives Considered but Eliminated

In considering alternative sites for the proposed Diamond green diesel project, Diamond had two primary available options including the selection of a greenfield site or co-locating at an existing refinery. As Valero is a participant in the joint venture, only Valero refineries were considered as sites for co-locating the project.

In order to take advantage of the considerable synergies of locating the project adjacent to an existing refinery, the co-location option was preferred. Synergies included the ability of the adjacent refinery to supply hydrogen, nitrogen, amine, steam, treated water (boiler feed, process, and cooling), and caustic, in addition to the ability to provide wastewater treatment and to allow for the recovery of hydrogen from purge gas and sulfur from sour water and rich amine. In addition, the adjacent refinery would receive the green diesel, light ends gas, and LPG/naphtha, integrating them directly into existing streams and product logistics, thereby eliminating or minimizing cost and environmental impacts associated with product storage and transport.

Of the thirteen Valero refinery locations in the U.S., the VSCR location offered the greatest benefits in feedstock availability (geographically located in the central U.S. with existing access to shipping and railroads), existing plot space, hydrogen availability, and access to product markets via existing connections to common carrier pipelines.

Other criteria leading to the selection of the St. Charles location included baseline environmental conditions; in particular, St. Charles Parish is in attainment for all National Ambient Air Quality Standards (NAAQS). In addition, the existing VSCR offered an available plot that was already cleared..

Once the VSCR co-location site was selected, different site configurations were considered. The final configuration was developed to use existing developed property, minimize interconnecting rail and piping, and avoid impacting nearby, lesser disturbed property surrounding the site.

3 CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This chapter summarizes the existing environmental, social, and economic conditions of the project area and the potential environmental effects that could result from implementing the proposed action or No Action Alternative described in Chapter 2. Additionally, a discussion of potential cumulative effects of the proposed action is provided.

3.2 Land Use and Visual Resources

3.2.1 Affected Environment

The Diamond green diesel plant would be constructed on a site adjacent to, and interconnected with, the existing VSCR within a major industrial area designated as such in section 11.5-33 of the St. Charles Parish Code. The adjacent VSCR has been in continuous operation since the 1940's and is surrounded by an industrial complex including other petroleum refining and petrochemical facilities. The total green diesel project includes: 1) an approximately 20-acre site that has been used for laydown, construction, and staging for approximately three years; 2) a new elevated piperack that would traverse property owned by Valero and maintained to provide right-of-way and easements for the KCSRC railroad and underground pipelines; 3) the construction of a new railcar scale and rail spur to connect the existing KCSRC track with the green diesel project site that would also cross within the property owned and maintained by Valero; and, 4) a 23-acre off-site area to be used for construction parking and laydown that is currently used by Valero for similar activities.

The green diesel plant site is bounded on the northwest and southwest by petroleum refining and chemical process units, including the existing VSCR to the south. The site is bounded on the northeast and southeast by undeveloped property. Airline Highway runs from the northwest to the southeast approximately 600 ft northeast of the site where it intersects with an unnamed access road that runs north to south and provides the main entrance to the green diesel plant site.

Residential areas are located approximately 1.5 mi to the southeast in New Sarpy and approximately 1 mi to the northwest of the green diesel plant site immediately adjacent to and west of the Shell Motiva Norco plant. The site is not accessible to the general public.

There are no unusual or unique landscape features in the area. Visually, the skyline south of Airline Highway in the immediate area of the VSCR is dominated by equipment associated with petrochemical plants. The proposed green diesel site is only partially visible from Airline Highway through a 100-ft wide corridor maintained by Valero consisting of cypress, tupelo, red maple, and other trees. The extent of

the visual screen is dependent on the season. No state or national parks, forests, or conservation areas are located on or near the green diesel site.

3.2.2 Environmental Consequences

Proposed Action

The project would not result in a change to existing land use, which is currently industrial and would remain so as a result of the project. The project construction would occur on a previously disturbed site. No state or national parks, forest conservation areas, or areas of recreational, ecological, scenic, or aesthetic importance would be affected by the project. Visually, the skyline south of Airline Highway in the immediate area of the refinery is dominated by equipment associated with petrochemical plants. The highest point of the newly constructed green diesel plant equipment would be the flare, with a stack height of approximately 150 ft. This is significantly shorter than other existing stacks within the industrial skyline of the surrounding area. The relatively low profile of the green diesel plant and its location within an existing industrial area would minimize any potential impacts to visual and aesthetic resources. In addition, the 100-foot wide corridor of existing trees would largely retain the current visual appearance as viewed from Airline Highway and would partially obscure the view of the green diesel plant.

No Action Alternative

There would be no major changes in land use at the green diesel plant site or the surrounding areas under the No Action Alternative. Other previously planned modifications to VSCR and plant operations would continue.

3.3 Air Quality

3.3.1 Affected Environment

The Clean Air Act (CAA), which was last amended in 1990, regulates air emissions from area, stationary, and mobile sources. The CAA requires the U.S. Environmental Protection Agency (USEPA) to establish National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The USEPA has established two types of NAAQS. Primary standards define the maximum levels of air quality that the USEPA judges necessary, with an adequate margin of safety, to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards define the maximum levels of air quality that the USEPA judges necessary to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. Air quality is generally considered acceptable if pollutant levels are less than or equal to these established standards on a continuing basis.

The USEPA Office of Air Quality Planning and Standards has set NAAQS for six principal air pollutants, called "criteria" pollutants, as codified in 40 CFR Part 50. They are carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3),

particulate matter as inhalable particulate matter with an aerodynamic diameter less than or equal to a nominal 10 microns (PM_{10}) and as fine particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 microns ($PM_{2.5}$), and sulfur dioxide (SO_2). These standards are summarized in Table 3.1.

Table 3.1
National Ambient Air Quality Standards

Air Constituent	Averaging Time	NAAQS Primary	NAAQS Secondary
Carbon Monoxide (CO)	1 hour	35 ppm	None
	8 hours	9 ppm	None
Lead (Elemental) (Pb)	Rolling 3-Month Average	0.15 µg/m^3	Same as Primary
Nitrogen Dioxide (NO_2)	1 hour	100 ppb	None
	Annual (arithmetic average)	53 ppb[1]	Same as Primary
Ozone (O_3)	8 hours[2]	0.08 ppm	Same as Primary
	8 hours[3]	0.075 ppm	Same as Primary
Particulate Matter (PM_{10})	24 hours	150 µg/m^3	Same as Primary
Particulate Matter ($PM_{2.5}$)	24 hours	35 µg/m^3	Same as Primary
	Annual	15.0 µg/m^3	Same as Primary
Sulfur Dioxide (SO_2)[4]	1 hour	75 ppb	None
	3 hours	None	0.5 ppm
	24 hours	0.14 ppm	None
	Annual	0.030 ppm	None

Source: 40 CFR Part 50, National Primary and Secondary Ambient Air Quality Standards.
ppm = parts per million.
ppb = parts per billion.
µg/m^3= micrograms per cubic meter.

1- The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here in ppb units for the purpose of clearer comparison to the 1-hour standard
2- Revoked in 2008 by EPA.
3- EPA proposes that the level of the 8-hour primary standard, which was set at 0.075 ppm in the 2008 final rule, should instead be set at a lower level within the range of 0.060 to 0.070 parts per million (ppm),
4- Notwithstanding the promulgation of a single 1-hour 75 ppb SO_2 NAAQS in 40 CFR 50.17 and listed here, the older 3-hour, 24-hour, and annual SO_2 also listed here, will remain applicable. They will no longer apply to an area one year after designation of an area.

The CAA requires the USEPA to assign a designation to each region of the U.S. based on the area's compliance with the NAAQS. The USEPA categorizes areas with regard to compliance or non-compliance with each NAAQS as follows:

- Nonattainment – areas that currently do not meet the NAAQS
- Attainment – areas currently meeting the NAAQS

- Maintenance – areas currently meeting the NAAQS, but that previously were nonattainment
- Unclassifiable – areas that cannot be classified based on available information and are treated as attainment until proven otherwise.

Ozone nonattainment areas are further classified as extreme, severe, serious, moderate, or marginal, depending on the severity of nonattainment. Both carbon monoxide and PM_{10} nonattainment areas are further classified as serious or moderate.

The Louisiana Department of Environmental Quality (LDEQ), as delegated by USEPA, is responsible for protecting Louisiana's air quality. State air quality standards are found within the Louisiana administrative code, LAC 33.III.Chapter 7, under the authority of the Louisiana Revised Statutes, RS 30-2001 and RS 30-2054. LDEQ has the responsibility for developing plans to attain and maintain compliance with the NAAQS in the state of Louisiana. The USEPA has the authority and duty to review and approve the Louisiana State Implementation Plan (SIP), which is an enforceable plan developed at the state level that explains how the state will comply with air quality standards according to the CAA. For areas in Louisiana that are in nonattainment with the NAAQS, the SIP describes how the area will reach attainment of the air quality standards. The state of Louisiana is in attainment state-wide with all NAAQS, with the exception of the Baton Rouge area, which is currently designated nonattainment for ozone.

The proposed green diesel project would be constructed in Norco, Louisiana, which is located in St. Charles Parish. St. Charles Parish is in attainment with the NAAQS for all pollutants.

Prevention of Significant Deterioration

In areas such as St. Charles Parish that are in attainment with the NAAQS, the CAA requires that new and existing major sources of regulated air pollutants comply with a preconstruction permitting review program to prevent the significant deterioration of air quality in the area. According to the Prevention of Significant Deterioration (PSD) regulations (40 CFR 52.21 and Louisiana Administrative Code (LAC) 33:III.509), PSD review is required on a pollutant-specific basis if a new major source will be constructed or if a major modification of an existing major source will occur. A proposed new source is considered a major source if the potential emissions would be above the major source threshold for any regulated air pollutant. A modification is considered a major modification if both the project emissions increase resulting from the modification and the contemporaneous net emissions increase of any regulated pollutant are equal to or greater than the respective pollutants' significant emission rate, as established by USEPA. The relevant PSD significance thresholds are shown in the following table.

Table 3.2
Prevention of Significant Deterioration Significance Thresholds

Air Pollutant	PSD Significance Threshold (tons per year)
Sulfur Dioxide (SO_2)	40
Particulate Matter (PM_{10})	15
Particulate Matter	25
Nitrogen oxides (NO_X)	40
Carbon Monoxide (CO)	100
Hydrogen sulfide (H_2S)	10
Volatile organic compounds (VOC)	40

The existing VSCR is a major source under the federal PSD Program. 2008 and 2009 actual emissions from the VSCR, as reported to the LDEQ, are shown below in Table 3.3., together with currently permitted emission rates. The currently permitted emission rates include emissions from the recently permitted VSCR Expansion Project.

Table 3.3
Valero St. Charles Refinery Actual and Permitted Emissions

Pollutant	2008 Actual Emissions (tons per year)	2009 Actual Emissions (tons per year)	Permitted Emissions (tons per year)
CO	185.20	298.67	4607.35
NO_X	816.60	639.32	2131.02
PM/PM_{10}	232.60	281.79	672.19
SO_2	237.70	348.71	2574.07
VOC	366.40	406.36	3127.21
H_2S	8.98	6.92	74.90

VSCR has received PSD permits and PSD permit modifications for past and proposed modifications and expansions of the refinery. Air quality dispersion modeling performed as part of the PSD permit review has demonstrated that no adverse impact occurs from emissions at the current actual emission rates and that no adverse impact would occur from emissions at levels significantly higher than the current permitted emission rates.

Because the Diamond green diesel plant and the existing VSCR would be located on adjacent properties and would be integrated, Diamond and Valero can treat the green diesel plant as part of the same stationary source as VSCR for purposes of permitting under the CAA.

Conformity Review

Section 176(c) of the CAA requires that federal actions conform to the appropriate SIP. The final rule for "Determining Conformity of Federal Actions to State or Federal Implementation Plans" was promulgated by USEPA on November 30, 1993 (58 CFR 63214) and took effect on January 31, 1994 (40 CFR Parts 6, 51, and 93). LDEQ implements the conformity requirements through LAC 33:III.Chapter 14, Conformity. The rule applies to all federal actions in criteria pollutant nonattainment and maintenance areas. If the proposed action were undertaken in a federally classified nonattainment or maintenance area, the regulatory provisions for conformity would apply. The proposed action lies within an attainment area for all criteria air pollutants in St. Charles Parish and thus the provisions of this rule do not apply.

Greenhouse Gases

GHGs are gases in the Earth's atmosphere that transmit short-wave incoming solar radiation, but absorb long wave infrared radiation re-emitted from the Earth's surface, or in simple terms they "trap heat." Gases exhibiting greenhouse properties come from both natural and human sources. Water vapor, CO_2, methane (CH_4), and nitrous oxide (N_2O) are examples of GHGs that have both natural and manmade sources, while other GHGs such as chlorofluorocarbons are exclusively manmade. In the U.S., GHG emissions come mostly from energy use. GHG emissions are driven largely by the combustion of fossil fuel for electricity generation, transport, and other needs. Energy-related CO_2 emissions resulting from petroleum, coal, and natural gas represent 82% of total U.S. manmade GHG emissions (NEIC 2008).

In the December 15, 2009 Federal Register, USEPA published an "endangerment finding" and a "cause and contribute" finding related to GHG. In this action, the USEPA found that the current and projected atmospheric concentrations of the mix of six long-lived and directly emitted GHGs are reasonably anticipated to endanger the public health and welfare of current and future generations. In addition, USEPA found that the emissions of the single air pollutant defined as the aggregate group of six well-mixed GHGs from new motor vehicles and new motor vehicle engines contributes to the GHG air pollution that threatens public health and welfare. These findings did not themselves impose any requirements on industry or other entities; however, they were a prerequisite to finalizing the GHG standards for light-duty vehicles.

USEPA has made two other rulemakings affecting GHG emissions from stationary sources. The first was a final rule requiring mandatory reporting of GHG emissions annually by several industrial sectors. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities in 31 industrial source categories or sources with fossil fuel combustion equipment that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to USEPA. The final rule was published in the Federal Register on October 30, 2009.

Finally, USEPA published a rule on June 3, 2010 tailoring the applicability criteria that determine which stationary sources and modification projects become subject to permitting requirements for GHG emissions under the PSD and title V programs of the CAA. Without this rulemaking PSD and title V requirements would apply, as of January 2, 2011, at the 100 or 250 tons per year levels provided under the CAA. EPA is phasing in the applicability of these programs to GHG sources, starting with the largest GHG emitters. This rule establishes two initial steps of the phase-in. The rule also commits the agency to take certain actions on future steps addressing smaller sources, but excludes certain smaller sources from PSD and title V permitting for GHG emissions until at least April 30, 2016.

3.3.2 Environmental Consequences

The air quality impact analysis addresses both construction and operational emissions. Construction activities would result in emissions from site preparation, haul road traffic, heavy construction machinery, welding, painting, and on-road vehicles (including heavy duty trucks, contract construction workers' personal vehicles used to commute to the site, and bus transport from parking to site). Operational emissions would result from storage vessels, loading and transfer of particulate materials, process heaters, cooling tower drift, flaring of startup emissions or upsets, and wastewater conveyance and treatment activities.

Proposed Action

Construction Emissions

Air emissions associated with the proposed construction activities would be of relatively short duration, commencing approximately May 2011 and ending approximately October 2012 and thus would result in short term impacts on air quality in the immediate vicinity of the Green Diesel Project site. For purposes of estimating emissions, the construction schedule has been divided in two phases, as described below.

- Phase I, consisting of site preparation and below ground work, would extend approximately from May 2011 through February 2012. During this phase, air emissions would result from site preparation activities such as bulldozing, grading and filling; combustion exhaust from heavy equipment and from on-road vehicles; particulate dust from haul road traffic; and welding fumes.

- Phase II, consisting of above ground construction work, would extend approximately from March through October 2012. During this phase, air emissions would result from combustion exhaust from heavy equipment and from on-road vehicles; particulate dust from haul road traffic; welding fumes; and painting.

Emissions have been estimated for each Phase of the construction program. Emissions calculations for site preparation, haul road traffic, and welding rely on USEPA's Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point

and Area Sources, 5th Edition, together with engineering projections for site activities. Emissions calculations for heavy equipment and vehicle exhaust rely on California Air Resources Board (CARB) compendium of emission factors. Emissions from painting are estimated using mass balance, using conservative assumptions of volatile materials in the paints applied and assuming all volatiles are emitted.

Table 3.4 below provides a summary of estimated air emissions from both phases of the construction program.

Table 3.4
Diamond Green Diesel Project
Estimated Construction Emissions

Activity	Construction Emissions for Green Diesel Project (tons)						
	CO	NO_X	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2e*
Phase I - Site Preparation and Below Ground							
Bulldozing, Grading, Filling (dust kickup)	--	--	--	--	7.54	0.75	--
Unpaved Haul Roads (dust kickup)	--	--	--	--	0.02	0.002	--
Heavy Equipment (combustion)	2.12	5.11	0.62	0.01	0.23	0.22	511.93
Onroad Vehicles (combustion)†	5.53	0.63	0.57	0.01	0.06	0.04	740.57
Welding	--	--	--	--	0.01	0.006	--
PHASE I TOTALS	**7.65**	**5.74**	**1.19**	**0.01**	**7.86**	**1.02**	**1252.50**
Phase II - Above Ground							
Unpaved Haul Roads (dust kickup)	--	--	--	--	0.02	0.002	--
Heavy Equipment (combustion)	2.79	4.44	0.69	0.01	0.27	0.25	482.21
Onroad Vehicles (combustion)†	8.78	0.95	0.92	0.01	0.11	0.07	1267.35
Painting	--	--	5.25	--	--	--	--
Welding	--	--	--	--	0.19	0.15	--
PHASE II TOTALS	**11.57**	**5.39**	**6.86**	**0.02**	**0.59**	**0.48**	**1749.56**
TOTAL EMISSIONS	**19.22**	**11.13**	**8.05**	**0.03**	**8.45**	**1.50**	**3002.06**

† Onroad vehicles includes heavy duty trucks used during construction, worker vehicles used to commute to site, and buses used to transport workers to/from parking.

* $CO_2e = CO_2$ emissions + (CH_4 emissions x GWP_{CH4})
GWP_{CH4} = Global Warming Potential of CH_4 = 21

To minimize emissions during the construction phase, haul roads would be limestone gravel covered. In addition, Diamond would apply water to haul roads and to dirt and fill materials handled during the site preparation phase. Total emissions from construction would be temporary, below defined PSD significance thresholds, and would not cause or contribute to any exceedance of the NAAQS.

Operational Emissions

Air emissions from the green diesel plant would be less than the major source thresholds and less than the significance thresholds established by USEPA under the federal PSD program. Emissions would occur from several sources, including storage vessels, process heaters, transfer and storage of particulate materials,

cooling tower drift, wastewater pretreatment and conveyance, and emissions from the flare during startup, shutdown, and any emergency or upset events. These sources are described in greater detail in the following paragraphs. The aggregates of these emissions are shown in Table 3.5.

Nine fixed roof tanks storing feedstock (biomass fats) and refined fats, as well as one tank storing citric acid, are proposed for the green diesel site. The tanks would be covered with fixed cone roofs. Due to the very low vapor pressure of the raw materials, each tank would generate low amounts (0.09 tons per year or less) of VOC emissions.

Two small heaters would be used in the process and would fire natural gas. The production process is exothermic, meaning heat is generated from the refining operations. Thus, for the majority of the time, the heaters are fired at minimal rates because less external heating is required. When in use, the heaters generate emissions of the criteria air pollutants CO, NO_2, SO_2, and of VOC. Diamond would equip the proposed heaters with ultra low-NO_X burners, which have been demonstrated to be a leading NO_X reduction combustion control technology.

Bleaching earth (clay) and filter aid (diatomaceous earth) materials would be utilized in the pretreatment process. Both materials would be delivered to the proposed green diesel plant, unloaded and conveyed to receiving silos, and routed to the process for use. The storage bins and conveyance to the process would be equipped with dust collectors that would control emissions of particulate matter with an efficiency of 99.9%, thereby greatly minimizing any particulate matter emissions from these sources.

A cooling tower would be installed at the proposed green diesel site to supply cooling water to process heat exchangers. The cooling tower would generate emissions of particulate matter from solids entrained in the cooling water, and potentially VOCs from any leaks of process fluids. Diamond would equip the cooling tower with drift eliminators to reduce drift from the tower, thereby reducing particulate emissions entrained in the mist.

Wastewater would be generated at the green diesel site. Diamond would use a dissolved air floatation (DAF) unit to pretreat the raw material pretreatment unit wastewater to remove most fats and solids before routing it for further treatment. The wastewater treatment and conveyance would result in minor VOC emissions of less than one ton per year.

A flare for controlling startup, shutdown, malfunction, and emergency activities is proposed for the green diesel plant. During unit startup and shutdown, off gases would be temporarily vented to the flare for combustion. Unit startup and shutdown is predicted to occur three times per year for approximately eight hours each. The flare is properly sized to handle these releases, and it is designed to destroy at least 98% of all combustible gases. The flare would burn a continuous pilot of natural gas. In addition some very minor vents may be routed to the flare during routine

operation, including analyzer vents and sample stations. These vents would result in very small amounts of emissions.

Diamond submitted an air permit application to LDEQ for the authorization of construction and operation of the green diesel plant on November 20, 2009. LDEQ issued notices requesting public comment on the proposed permit in *The Advocate*, Baton Rouge, on January 11, 2010, and in *The Saint Charles Herald Guide*, Boutte, on January 14, 2010. The final permit was issued by LDEQ on March 1, 2010.

Potential emissions from operation of the proposed green diesel plant were estimated as part of the air permit application and are approved in the final permit. The proposed green diesel project would be a source of air emissions at levels well below the major source thresholds. Nonetheless, because the green diesel plant would be co-located with the VSCR, Diamond obtained a title V air quality permit from the LDEQ for the Green Diesel Project. The following table summarizes the estimated air pollutant emissions from all of the sources discussed in this section that would occur at the green diesel plant.

Table 3.5
Diamond Green Diesel Plant
Potential Air Emission Rates
Permit No. 2520-00158-V0

Pollutant	Potential Emissions (tons/year)
NO_X	4.68
CO	11.18
SO_2	0.24
PM/PM_{10}	1.63
VOC	20.79
NH_3	< 0.01
n-Hexane	<0.01
H_2S	0.04

Additionally, a PSD applicability analysis was performed for the emissions increases associated with the proposed plant in combination with emissions increases associated with the project at the VSCR. Small emission increases may occur at existing equipment within the VSCR as a result of wastewater treatment of the green diesel plant wastewater streams, treatment of sour water and acid gas from the green diesel plant operations in the VSCR sulfur recovery unit, production of hydrogen to supply the green diesel plant and recovery of hydrogen from the hydrogen purge gas stream at the VSCR hydrogen plant, and storage of green diesel products in VSCR storage vessels. Table 3.6 is a list of all VSCR equipment affected by the proposed project indicating the associated emissions increase. These emissions increases can be accommodated within the current permitted

emission rates for the sources; therefore, no revisions to emission limits for VSCR sources were necessary.

Table 3.6
VSCR Affected Sources and Related Emissions Increases

VSCR Project-Affected Sources	EPN	Project-Related Emissions Increase (tpy)				
		PM/ PM_{10}	SO_2	NO_x	CO	VOC
Controlled Loading (MVRU TO 1) for Naphtha Product	94-8	0.003	0.000	0.04	0.04	0.48
SMR Heater No. 1	2004-7	3.42	11.74	6.88	37.71	2.45
Steam Increases (Boiler 401-C)	94-43	0.13	0.44	2.15	1.36	0.09
SRU TO CAP	GRP007	--	1.34	0.01	--	--
Diesel Storage (150-22)	94-52	--	--	--	--	2.33
Naphtha Storage (67-1)	94-59	--	--	--	--	0.01
Slop Storage (180-9)	31-81	--	--	--	--	0.0002
Uncontrolled Loading (Docks) for Green Diesel Product	94-9	--	--	--	--	0.99
Wastewater Treatment Unit	WWTU	--	--	--	--	1.48

The combined emissions increases of each PSD-regulated pollutant are below their respective PSD significance threshold; therefore, the proposed project is a minor modification under PSD. The combined emissions increases for the proposed green diesel plant and the VSCR are represented in Table 3.7 in comparison to the PSD significance thresholds.

Table 3.7
Combined Green Diesel Plant and VSCR Emissions Increases
Compared to Prevention of Significant Deterioration Significance Thresholds

Pollutant	PSD Significance Threshold (tons per year)	Estimated Project Emissions Increases (tons per year)	Significant Increase?
NO_X	40	13.76	No
CO	100	50.29	No
SO_2	40	13.76	No
PM/ PM_{10}	25/15	5.18	No
VOC	40	28.62	No
H_2S	10	0.04	No

Both the detailed emissions calculations for the green diesel plant emission sources and the detailed PSD applicability review documenting emission increases that may occur at VSCR are included as part of the air permit application submitted to LDEQ.

As can be seen from tables 3.5 and 3.7, permitted air pollutant emissions from the proposed project would be small relative to regulatory limits. In addition, the green diesel project would employ air pollution control equipment as part of its best management practices. Table 3.8 contains a summary of the controls proposed for the proposed project's emission sources during normal operation.

Table 3.8
Diamond Green Diesel Plant
Air Contaminant Emission Controls during Normal Operation

Emission Source	Proposed Method of Control
Process Heaters	Ultra low-NO_X burners for NO_X reduction, use of natural gas as fuel to minimize emissions
Bleaching Earth & Filter Aid Unloading & Transfer	Pneumatic conveyance and dust collection system to control particulate matter emissions with a minimum 99.9% capture efficiency
Cooling Tower	Drift eliminators to reduce particulate matter emissions
Piping Components	Implementation of leak detection and repair program
Startup/Shutdown and emergency or upset events	Flare with a minimum 98% VOC destruction efficiency

Greenhouse Gas (CO_2) Emissions

On March 26, 2010, the USEPA published *Regulation of Fuels and Fuel Additives: Changes to Renewable Fuel Standard Program* (75 FR 14669), which included regulatory determinations for fuel pathways based on USEPA's current lifecycle assessments. For biodiesel from waste oils, fats and greases, the assessment of each element in the lifecycle process included collecting and transporting the feedstock, transforming it into a biofuel, and distributing and using the fuel. Based on USEPA's lifecycle assessment, they estimate biofuel from waste oils, fats and greases result in an 86% reduction in GHG emissions compared to the 2005 baseline for petroleum diesel.

In the lifecycle assessment, USEPA relies upon emission factors expressed as kilograms of CO_2e emitted per million BTU heat content of fuel (kg CO_2e/mmBTU) to compare biodiesel to petroleum diesel for three components of the lifecycle: fuel production, fuel and feedstock transport, and tailpipe emissions. Using this approach, the greenhouse gas emissions impact for biodiesel and petroleum diesel can be seen on an energy equivalent basis.

The total emission factor for all three components of the lifecycle is calculated by summing the emission factor for each component. The lifecycle GHG emissions for the project can be calculated by multiplying the total green diesel heat content times the total CO_2e emissions factor and converting to metric tons.

Using USEPA's lifecycle analysis, the lifecycle GHG emissions from the proposed project would be approximately 271,000 metric tons CO_2e per year, as shown in Table 3.9. Performing the same analysis for petroleum diesel allows a comparison of GHG emissions impacts of the green diesel project to traditional fuel production, as compared on an equivalent level of annual energy content of fuel. Lifecycle GHG emissions from the proposed project would be approximately 1.6 million metric tons less than from traditional fuel production.

Table 3.9
Diamond Green Diesel Plant
Proposed Greenhouse Gas Emissions

Parameter	units	Green Diesel Proposed Action	Baseline Diesel No Action Alternative
Fuel Production[1]	kg CO_2e/mmBTU	10	18
Fuel and Feedstock Transport[1]	kg CO_2e/mmBTU	3	
Tailpipe Emissions[1]	kg CO_2e/mmBTU	1	79
Total Emissions[1]	kg CO_2e/mmBTU	14	97
Diesel Production	bbl/year	3,985,800[2]	3,561,498[3]
Diesel heat content	BTU/gal	115,720[4]	129,500[5]
Diesel heat content	mmBTU/bbl	4.860	5.439
Total diesel heat content	mmBTU/year	19,370,988	19,370,988
GHG Emissions	**metric ton CO_2e/year**	**271,194**	**1,878,986**

CO_2e, equivalent CO_2, is the amount of CO_2 that would produce the same radiative forcing (warming) as the greenhouse gas. It is derived by multiplying the amount of greenhouse gas by its global warming potential.

1 - 75 FR 14789, Table V.C-2–Lifecycle GHG Emissions for Biodiesel, 2022

2 - Green Diesel bounding case model – 10,920 bbl/day production, see Table 2.1

3 - Based on equivalent energy content as green diesel project annual diesel production

4 - *A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions*, EPA420-P-02-001, October 2002, p 42 (animal-based)

5 - *A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions*, EPA420-P-02-001, October 2002, p 43 (average)

Diamond would monitor and report GHG emissions as required by 40 CFR Part 98, EPA's Mandatory GHG Reporting Rule, adopted in 2009.

No Action Alternative

Under the No Action Alternative, there would be no new emissions or changes in air quality over current operations. Also, there would be no reduction in the lifecycle GHG emissions, which would remain at approximately 1,879,000 metric tons CO_2e per year for the corresponding amount of fuel energy from fossil-based diesel as shown in Table 3.9.

3.4 Noise

3.4.1 Affected Environment

The green diesel plant would be located adjacent to and just northeast of the existing VSCR and existing KCSRC, and just east/northeast of the adjacent Shell/Motiva refinery and chemical plant; thus, it would be situated in an area which is characterized by a noise level typical of an industrial petrochemical refining complex. The nearest noise-sensitive receptors in the vicinity of the green diesel plant are residences in New Sarpy, which lies adjacent to the existing VSCR to the southeast, approximately one mile from the green diesel plant site. It is current practice for shift superintendents and security personnel from the VSCR to conduct routine daily noise patrols around the perimeter of the VSCR and in the surrounding neighborhoods to assess the potential for noise impacts or odors. Currently, noise from the refinery is not an issue with the adjacent neighbors.

St. Charles Parish does not set a noise ordinance for industrialized areas, which are defined as "a district intended for light manufacturing, processing, storage and warehousing, wholesaling and distribution." The maximum acceptable noise level within a residential area is 60 dBA during daytime hours and 55 dBA during nighttime hours (St. Charles Parish, 2009).

Table 3.10
St. Charles Parish Maximum Permissible Sound Levels by Receiving Land Use Category

Land Use Category	Time	Sound Level Limit (dBA)
Residential, noise-sensitive area, public space	7:00 a.m.--10:00 p.m.	60
	10:00 p.m.--7:00 a.m.	55
Multi-family dwelling	7:00 a.m.--10:00 p.m.	50
	10:00 p.m.--7:00 a.m.	45
Commercial	7:00 a.m.--10:00 p.m.	65
	10:00 p.m.--10:00 a.m.	60
Industrial	Not Applicable	Not Applicable

Source: St. Charles Parish, 2009

The Occupational Safety and Health Administration (OSHA) provides standards for occupational noise exposure. Employees should not be subjected to sound exceeding levels ranging from 90 dBA for an 8-hour exposure to 115 dBA for a 0.25-hour exposure (29 CFR 1910.95).

3.4.2 Environmental Consequences

Proposed Action

Construction Noise

Construction activities would generate a temporary increase in ambient noise levels. All construction activities would be conducted in accordance with OSHA guidelines, which address noise and hearing conservation in specific standards for the construction industry. If construction workers or other contractors or employees have the potential to be exposed to noise that exceeds OSHA standards, they would be provided personal protective equipment per the regulations.

Noise from construction would be temporary and limited to daytime hours, and is not anticipated to impact residents in the area. This assessment is based on two aspects of the physics of sound. First, sound pressure level (dBA) falls inversely proportional to the distance from the sound source, which results in an approximate 6 dBA decrease with every doubling of distance from the source. (For reference, see http://www.sengpielaudio.com/calculator-distance.htm). Table 3.11 lists the typical construction equipment that could be used for the project and associated maximum noise levels at a distance of 50 ft. The nearest residential area is approximately 1 mile (5,280 ft.) away from the green diesel plant construction site. Therefore, even assuming no sound barriers between the construction site and the nearest residence, noise from construction would be projected to dampen to less than 50 dBA at the nearest residential receptor.

Table 3.11
Maximum Noise Levels at 50 Feet for Common Construction Equipment

Equipment Type	Maximum Noise Level Lmax at 50 ft (dBA, slow)*
Bulldozer	85
Dump Truck	84
Excavator	85
Flat Bed Truck	84
Grader	85
Paver	85
Pneumatic Tools	85
Pickup Truck	55

USDOT 2006

Second, sound pressure levels (dBA) are based on a logarithmic scale and cannot be added or subtracted arithmetically. For example, if one machine emits a sound level of 90 dB, and a second identical machine is placed beside the first, the combined sound level is 93 dB, not 180 dB. Further, if the construction site noise level from one machine is 85 dBA and another machine is added with a noise level of 70 dBA, the total noise level remains at 85 dBA, not greater. (For reference, see http://www.ccohs.ca/oshanswers/phys_agents/noise_basic.html#_1_13). Table 3.12 below, taken from the Canadian Centre for Occupational Health and Safety website, illustrates that noise levels do not increase appreciably when additional sources of noise are added to an area. Therefore, given that the green diesel project would occur at an existing industrial site, no appreciable increase in the total noise level is anticipated.

Table 3.12
Addition of Decibels

Numerical difference between two noise levels [dB(A)]	Amount to be added to the higher of the two noise levels [dB or dB(A)]
0	3.0
0.1 - 0.9	2.5
1.0 - 2.4	2.0
2.4 - 4.0	1.5
4.1 - 6.0	1.0
6.1 - 10	0.5
10	0.0
Step 1: Determine the difference between the two levels and find the corresponding row in the left hand column. **Step 2:** Find the number [dB or dB(A)] corresponding to this difference in the right hand column of the table. **Step 3:** Add this number to the higher of the two decibel levels.	

Operational Noise

During operations, based on the same functions of noise dampening and additivity as discussed above, noise is not expected to impact local residents or other noise-sensitive receptors. Further, the current practice of routine noise patrols would be continued, and if any disturbing noise levels were found, corrective action would be taken to identify and mitigate the source. If any employees would have the potential for exposure to noise that exceeds OSHA standards, personal protective equipment would be employed.

No Action Alternative

Noise from current uses and vehicle traffic at the green diesel project site and adjacent VSCR would continue under the No Action Alternative. Current operations would continue with no changes in noise levels.

3.5 Geology and Soils

3.5.1 Affected Environment

Geology

The Risk Evaluation Corrective Action Program Report prepared for Orion Refinery in 2003 described an evaluation of site geology that was conducted in 2000 (Conestoga-Rovers & Associates 2003). Based on the evaluation, which included exploratory borings, the site geology consists of fill (silty clay) to approximately five ft below ground surface (bgs). Underneath the fill are clays and silty clays (roughly 25 ft bgs), clayey sandy silts and silt (to at least 40 ft bgs), and clayey soil.

Soils

According to the National Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) Database, the green diesel project site, including the area where the plant would be constructed as well as the area where the piperack, rail spur and railcar scale would be constructed, is entirely on Fausse Clay (NRCS 2009). Fausse clay consists of very deep, very poorly drained, and slowly permeable soils that formed in clayey alluvium in areas of the lower Mississippi River. They are low, ponded backswamp areas with slopes of 0 – 1 %. The depth of the water table in areas of Fausse clay is less than 1 in and flooding and ponding is frequent. The SSURGO database soil profile for the project site indicates that Fausse clay is found to a maximum depth of 75 in (NRCS 2009). The Fausse Clay, which is found in 100% of the Project area, is not unique to the site; rather, it is common to the lower Mississippi River basin. The offsite laydown and parking area is currently covered with limestone gravel.

The Soil Survey of St. Charles Parish (USDA 1987) defines prime farmland soil types in the parish as Commerce silt loam, Commerce silty clay loam, Harahan clay, Sharkey silty clay loam, and Sharkey clay. The green diesel plant site and laydown area do not contain prime farmland soils (Figure 3.1). All soils have been impacted through previously permitted development and activities associated with construction, laydown, and right-of-way access.

3.5.2 Environmental Consequences

Proposed Action

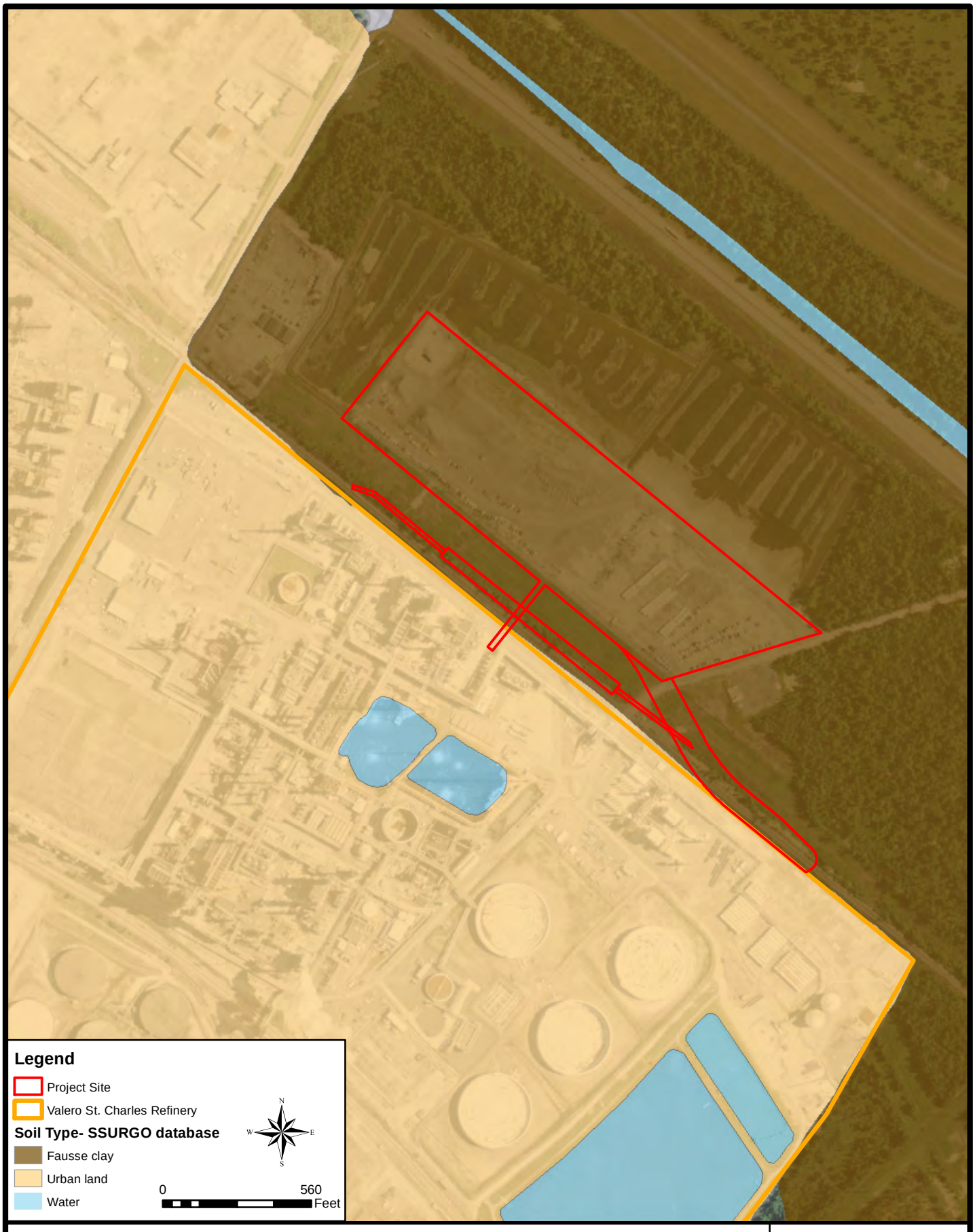
There are no known barriers to construction from geological changes proposed as part of the project. Pile driving to a depth of no more than 70 ft is expected throughout the site to support equipment and foundations, but existing levels of compaction and minor site grading and leveling are expected to address any remaining site stability concerns prior to construction.

No impacts to geology resources are expected because there are no unique geological resources on the plant site, off-site laydown yard, and rail spur/pipe rack/railcar scale areas. The green diesel plant site was previously cleared and filled for use as a laydown yard and parking by VSCR. The KCSRC ROW and 3rd pipeline easement land strip has been maintained and cleared for many years. Finally, there would be no change to the existing use for the offsite laydown yard and parking area, thus no new impact would be expected.

Minor grading for plant site preparation and construction of the rail spur may increase soil erosion or cause sedimentation and runoff during precipitation events. Diamond would use best management practices to prevent soil loss and comply with terms and conditions of the construction storm water permit and Storm Water Pollution Prevention Plan (SWPPP). No grading or soil disturbance would be required at the laydown area as there would be no change to the existing use.

No Action Alternative

No changes to geology or soil conditions would occur under the No Action Alternative. As a result, no new impacts would be expected.



Soil Type Map
Diamond Green Diesel Project
Norco, LA

Figure
3.1

3.6 Water Resources

3.6.1 Affected Environment

The proposed green diesel project site is located near the east bank of the Mississippi River (see Figure 2.1). The site is located in the Eastern Louisiana Coastal Watershed and lies within the boundaries of the Louisiana Coastal Zone as defined by the State and Local Coastal Resources Management Act of 1978. Drainage in the area is to both the Mississippi River Basin and the Lake Pontchartrain Basin.

Groundwater

Four major freshwater aquifer systems are in the Saint Charles Parish Norco area. These include the "shallow aquifers," the Gramercy aquifer, the Norco aquifer and the Gonzales-New Orleans aquifer. There are no drinking water, livestock or irrigation wells in proximity to the proposed project site. The uppermost shallow aquifers are of limited extent and irregular, characterized by point bar deposits and channel sands, and occur generally at a depth of less than 150 ft bgs. The shallow aquifer water is characteristically very high in mineral and iron content. Shallow groundwater has been determined by LDEQ to be unsuitable for drinking due to high transmissivity. The direction of flow in the shallow aquifer is to the south (i.e., toward the Mississippi River). The Gramercy aquifer is located approximately 110 to 135 ft bgs in the vicinity of the proposed project. The Gramercy aquifer can serve as a hydraulic link between the overlying shallow aquifer system and the underlying Norco aquifer. These aquifers, together with the Mississippi, form part of a large hydrologic system. The Norco aquifer, at the "400' sand", is the most important aquifer in the area with the greatest potential for development of freshwater supplies. This aquifer lies about 300 ft bgs in the vicinity of Norco and dips south at about 10 ft per mile. The Gonzales-New Orleans aquifer, at the "700' sand", is the thickest of the aquifers and underlies the entire parish. Water quality limits the use of the Gonzales-New Orleans aquifer.

Surface Hydrology and Water Quality

The principal source of surface water in the vicinity of the project is the Mississippi River, which provides significant public water supplies. The VSCR discharges into segment LA070301 of the Mississippi River, which is listed as impaired due to mercury, nitrogen, pathogen indicators, pesticides, phosphorus, and priority organics based on the 2002 Consent Decree 303(d) list.

Wetlands

The proposed site is adjacent to freshwater forested-shrub wetland, according to the United States Fish and Wildlife (USFWS) National Wetland Inventory (NWI) (1988). There are no existing wetlands on the proposed plant site. In May 2005, the New Orleans District of the USACE issued Permit # MVN 2005-775 EE under Section 404 of the Clean Water Act, authorizing the clearing, grading, and maintenance of 90,500 yd^3 of fill in 18.7 acre of the proposed 20-acre plant site, which was then composed of wooded wetlands, to be used for plant expansion, parking, and a construction

laydown yard adjacent to the VSCR. The site has since been filled under the terms and conditions of the 2005 permit. Compensatory mitigation was provided through a contract with Riverside Coastal Mitigation Lands, LLC for the restoration of cypress swamp on 195.1 acres of abandoned agricultural lands. With the exceptions of the new elevated pipe rack and rail spur and the off-site construction parking and laydown yard, the green diesel project impacted area (Figure 2.2) is located on and contained within this previously permitted and filled 20-acre site.

The laydown yard and parking area was in its existing condition (cleared, covered with limestone, and fenced) when Valero purchased the site for use as laydown storage and parking. The property has remained in use for this purpose since its purchase. The prior owner obtained a jurisdictional determination from the USACE, dated December 10, 2008, stating that the property is not in a wetland subject to the Corps' jurisdiction.

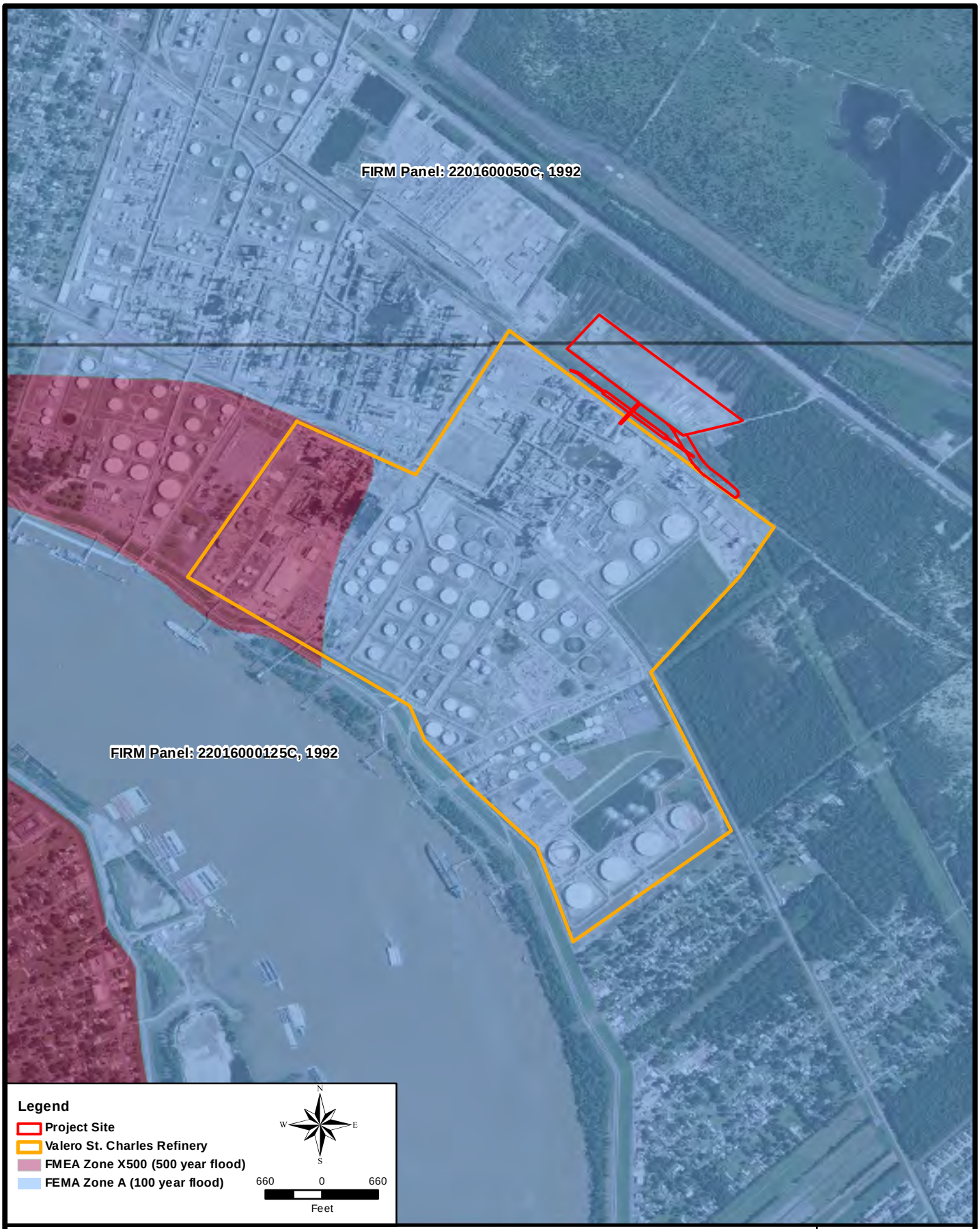
The property to be traversed by the piperack and rail spur/railcar scale is required to be maintained and cleared as existing right-of-way for the KCSRC and other third party existing underground pipes. On behalf of Diamond, ENVIRON conducted a wetlands delineation to determine if the area impacted by construction of the piperack, rail spur, and railcar scale contains wetlands and/or waters of the United States that may be under USACE jurisdiction. The approximately 4.5 acres that would be impacted were delineated as herbaceous wetland, with the exception of the crossing at the intersection of the new rail spur with the existing unpaved road, where a small portion of land is delineated as upland.

Floodplains

The proposed green diesel project site is located near the east bank of the Mississippi River, within the boundaries of the Louisiana Coastal Zone as defined by the State and Local Coastal Resources Management Act of 1978. However, according to the USACE, the VSCR and proposed green diesel project site is not within the coastal lines of defense because it is within the protection boundaries of two hurricane protection levees. The Lake Pontchartrain Levee District maintains levees in St. Charles and surrounding parishes.

The VSCR and the proposed green diesel project site are located between the St. Charles Parish East Bank Hurricane Protection Levee to the north and the Lower Guide Levee and the Bonnet Carre Spillway to the west. The Project area did not receive storm surge from hurricanes Rita or Katrina in 2005.

Based on available information from Federal Emergency Management Agency (FEMA), the proposed plant site is located within the 100-year floodplain (Figure 3.2). The laydown yard and parking area is not in the 100-year floodplain.



Floodplain Zones with FIRM Panels
Diamond Green Diesel
Norco, LA

Figure
3.2

3.6.2 Environmental Consequences

Proposed Action

Construction

The green diesel plant is designed to avoid impacts to groundwater. Pilings would be no greater than 70 ft bgs, thereby assuring that the shallow aquifers would not be impacted and no potential conduits for carrying contamination into groundwater supplies would be created. To minimize the potential for impacts on groundwater and surface water during the construction phase of the project, storm water would be managed under an LDEQ storm water general permit for small construction activities (Permit #LAR200000 dated March 1, 2008). Prior to commencement of construction, Diamond would prepare and submit a Notice of Intent to obtain coverage under the storm water general permit for construction activities. In conjunction with the storm water construction permit, Diamond would develop and implement a SWPPP. The SWPPP would specify best management practices to minimize and mitigate impacts to nearby water bodies from storm water runoff during construction, including such practices as storm water drainage management and erosion control measures (silt fences, straw bales, or earthen berms), proper housekeeping of equipment and materials used in construction to minimize loss or contact that may contribute to storm water contamination, washing vehicle tires on vehicles entering the site prior to leaving to avoid transfer of silt or dirt to roadways, and containment, collection, and disposal of onsite wastes to avoid contact with storm water.

Operations

Groundwater and Surface Water

During operation of the green diesel plant, protection of groundwater and surface water resources would be achieved by implementing best management practices under the existing VSCR Louisiana Pollutant Discharge Elimination System (LPDES) permit. Approximately 39 gpm of wastewater would be generated from the green diesel plant. Prior to sending wastewater to the VSCR WWTP, it would be pretreated using an oil/water separator, a DAF unit and biological treatment to remove traces of fats and most solids, resulting in an 80% reduction in BOD and COD of this effluent. Pretreated process wastewater from the green diesel plant would be routed to the existing VSCR wastewater treatment plant (WWTP) and ultimately discharged to the Mississippi River through Outfall 001. Similarly, first flush process area storm water from the green diesel plant site would be collected through a storm water sump and conveyed with process wastewater to the VSCR WWTP for treatment and ultimate discharge through Outfall 001. Valero will submit a permit application to make the appropriate revisions to the current LPDES Permit No. 0052051 to reflect the addition of the green diesel plant process wastewater stream and first flush process area storm water to the streams receiving treatment at the WWTP and discharged through Outfall 001. It is not expected that effluent limits would change. The permit would be revised as necessary prior to commencement of operation of the green diesel plant, with a planned schedule of May 2011 to submit the permit application. The proposed project is not anticipated to appreciably affect

the quality or quantity of storm water or wastewater effluent, as permitted under the existing LPDES permit.

Diamond would obtain coverage for storm water discharge under the multi-sector general permit for industrial storm water discharges. A Notice of Intent would be filed prior to commencement of operation; the planned filing date is in May 2012. Operation under the general permit for industrial storm water would require that Diamond develop and implement a SWPPP setting forth best management practices. As part of Diamond's best management practices, storm water from all non-process areas where liquids would be handled (e.g., tank farm) would be collected in a storm water detention pond for monitoring prior to discharge. This design would prevent the discharge of pollutants into surface waters.

The project would not utilize any groundwater; therefore no impact to groundwater supply is anticipated. The green diesel plant is structurally designed to avoid compromising any groundwater aquifers by not creating pathways for contamination. All pilings would be set to a depth that is well above the shallow-most occurrence of the uppermost groundwater aquifer system.

Process water for the green diesel project would come from VSCR, which gets water from the Mississippi River. The VSCR 2008 LPDES renewal permit basis was approximately 6750 gpm draw from the Mississippi River, while the projected green diesel plant maximum supply is expected to be approximately 410 gpm or 6% of the current VSCR use, exclusive of fire water, which is provided as needed. Thus the green diesel project is not anticipated to have an impact on water resources with regard to usage of the surface water supply from the Mississippi River via the VSCR water intake and conveyance infrastructure.

In the unlikely event of an accident caused by equipment malfunction, human error, or natural phenomena, releases of waste or process materials to surface water or groundwater could occur from a spill or leak. In addition to the protective design for the collection of storm water runoff, Diamond would establish an integrated spill prevention, containment and countermeasure plan to prevent, detect, and mitigate any releases of chemicals from tanks and vessels to the environment. An emergency response plan, including environmental emergency coordinator responsibilities, is also in place at VSCR and would be updated as needed.

Wetlands and Floodplains

Because no wetlands are located on the affected areas of the green diesel plant site and laydown area, no wetlands impacts would occur. Wetlands that were previously located on the plant site have been mitigated pursuant to USACE Permit #MVN 2005 775 EE.

A wetland delineation determined that the area impacted by construction of the piperack, rail spur, and railcar scale contains herbaceous wetlands. The piperack, rail spur, and railcar scale would fill and permanently impact approximately 4.5 acres

of the wetland. This area has been previously impacted through vegetative maintenance and drainage alteration resulting from construction and maintenance of the existing railway and underground pipelines and is now primarily freshwater marsh under current conditions. Based upon the condition of nearby wetland systems that have not been directly impacted through clearing or fill activities, it can be derived that the onsite wetlands were likely cypress swamp in the past, but are no longer serving such environmental functions in their current state. As such, their contribution to the environment through basic wetland functions such as water storage and habitat for wildlife can be considered minimal.

Diamond applied for and received a USACE Section 404 wetlands permit. Diamond has offset the impacts of the 4.5 acres of wetland being filled by contracting for the restoration of 10 acres of cypress swamp from the High Point Mitigation Company, LLC, which will complete the mitigation at High Point Mitigation Area, Phase I.

The green diesel plant site is located within the FEMA 100-year floodplain. In compliance with Executive Order 11988, Floodplain Management and DOE's implementing regulations found at 10 CFR 1022, a notice of floodplain action and availability of floodplain assessment was published in the St. Charles *Herald-Guide.* A floodplain assessment was conducted for the proposed project and incorporated into this EA.

Several significant factors were considered in the site selection process, which collectively led to location of the project at this site. As discussed in Section 2.3, Alternative Project Sites, Diamond undertook a deliberative site selection process for the project, first considering two primary options: construction on a greenfield site or co-locating with an existing Valero refinery. The co-location option was chosen based on the considerable economic and environmental advantages associated with integrating the green diesel project with existing infrastructure. Potential advantages of co-location included the ability of the adjacent refinery to supply hydrogen, nitrogen, amine, steam, treated water (boiler feed, process, and cooling), and caustic, in addition to the ability to provide wastewater treatment and to allow for the recovery of hydrogen from purge gas and sulfur from sour water and rich amine. In addition, co-location offers the obvious advantage of providing the ability to route green diesel products directly into existing refinery product streams for storage and transport.

Having decided to co-locate the green diesel project with an existing Valero refinery, Diamond then considered which refinery offered the greatest overall advantages. Of the thirteen Valero refinery locations in the U.S., three potential sites were initially developed. These included the St. Charles, Port Arthur, and Corpus Christi refineries. Corpus Christi, while not being situated in the 100-year floodplain, was eliminated for several reasons. Corpus Christi could not meet the sour gas supply demand for the green diesel plant, was not close to raw material and pretreatment material supplies, and land availability for the project was inadequate. These negatives would have required additional land disturbance and additional

transportation impacts and cost, and land availability could have become a critical hindrance to project development. With regard to Port Arthur, sour gas supply was also inadequate, and several other aspects of the project integration, though adequate, were less advantageous than St. Charles. The Port Arthur refinery is also in the 100-year floodplain. Thus, selection of St. Charles Parish as the project site provided the greatest advantages, both economically and environmentally, with no greater floodplain impact than the next best site option.

The proposed plant site covers approximately 20 acres, which currently drain to the surrounding wetlands areas. The green diesel project would not reduce the size of surrounding wetlands, and storm water would continue to drain to those areas after the project is constructed. First flush storm water would be collected via a retention basin and treated to avoid any potential for contaminated storm water discharge. The proposed plant site has been previously filled and is currently covered in limestone gravel and in use as a parking and lay down area, thus it is not currently providing significant floodwater storage capacity. Additionally, the newly constructed retention basin would receive storm water from any impervious process areas, thereby offsetting lost capacity for storm and floodwater storage provided by the existing gravel covered soil.

Similarly, the offsite lay down and parking area is filled and graveled and does not currently serve as floodwater storage. The use of this site for laydown and parking would be temporary during construction and would be the same as the current use; therefore no change with respect to flooding risks or impacts would result from the proposed project.

The plant site is protected from storm surge by the St. Charles Parish East Bank Hurricane Protection Levee to the north and the Lower Guide Levee and the Bonnet Carre Spillway to the west. The plant site has been previously filled to an elevation of approximately 98' NAVD88, which is the same approximate elevation as the adjacent VSCR industrial area. Green diesel project construction activities would utilize additional fill to account for any settling that has occurred and to grade the plant site to the desired approximate 98' NAVD88 elevation. Because the plant site would be at the same elevation as the adjacent VSCR process areas and higher than the adjacent surrounding wetlands areas, it would not receive storm water surges or floodwaters from the adjacent properties. Furthermore, at the approximate 98' NAVD88 elevation, the VSCR industrial site has not been subject to flooding, including significant hurricane events of recent years.

Construction of the green diesel plant at the proposed 20 acre site is not anticipated to impact the local floodplain or to create flooding or surge impacts to the surrounding developed properties because: it is a small area in comparison to the surrounding developed industrial sites (see Figure 2.1); it is currently not serving as prime floodwater storage capacity due to the fact that it is cleared, filled, raised to the level of the surrounding industrial sites and above the surrounding wetlands, and covered with gravel; and, a new retention basin would provide protection from

contaminated storm water runoff and new capacity for storm water surge protection. Further, the plant site would be protected from flooding by being constructed at the approximate 98' NAVD88 elevation, and by the existing levee and spillway flood protection systems.

The local Floodplain Administrator is the St. Charles Parish Department of Planning and Zoning, which operates under the Parish Council. Diamond is in communication with the Parish Council, including the Planning and Zoning Commission. The Parish is aware of and has endorsed the project, as documented in the March 2010 St. Charles Parish MidTerm Report, in which Parish President V. J. St. Pierre cites plans for the biodiesel plant to be constructed at the site as an accomplishment in helping the Parish to achieve the Administration's stated Goal 6, to "build a diverse economy with the ability to sustain during economic changes." In addition, the St. Charles Parish Council adopted Resolution No. 5260 in 2005, stating that the Council offers no objection to expansion of the existing industrial development to include the proposed plant site, in conjunction with initiating the current use for laydown and parking.

The rail spur and railcar scale would impact a small footprint (approximately 4.5 acres combined), the affected land is currently cleared, the planned use is consistent with the current use for the existing railroad, and the new spur and scale would be designed to avoid or minimize any obstruction to the existing flow patterns, therefore no concerns related to flooding are anticipated. In order to avoid obstruction of drainage resulting from the installation of the railway spur at the site, culverts large enough in size to possess sufficient flow capacity would be installed. Specifically, the culverts proposed for installation would be located under the existing roadway that traverses the site, and under the proposed railway spur to the immediate east. These features have been designed to handle the necessary drainage without resulting in upstream flooding.

Coastal Zone Management Act

A Coastal Zone Management Act (CZMA) consistency determination was made for the green diesel plant site as part of the wetlands permitting action in 2005. For the offsite laydown and parking area, no change is being made to the current land use or conditions, thus no CZMA determination would be triggered. Diamond has received a Coastal Use Permit and CZMA consistency determination from the Louisiana Department of Natural Resources (LDNR) for the area where the piperack, rail spur, and railcar scale would be constructed.

No Action Alternative

There would be no impacts on water resources under the No Action Alternative because the Project would not occur. Existing uses of the project site and other projects planned or under construction in the area would continue.

3.7 Biological Resources

3.7.1 Affected Environment

According to the Level III and IV Ecoregions of Louisiana (Daigle et al. 2006), the proposed project area is located within the Mississippi Alluvial Plain Inland Swamps Ecoregion. The Ecoregion is characterized by poorly or very poorly drained soils, backswamps, bayous, natural levees, wetlands, and low-gradient and channelized streams. The vegetation consists of swamp forest communities dominated by bald cypress and water tupelo, with sedges, grasses, and rushes. Wetland vegetation includes water hyacinths, water lily, cattails, and duckweed. Overcup oak-water hickory forest and oak-sweetgum forest are found in areas flooded less frequently. Typical land cover for this ecoregion is forested wetland, and typical land use in undeveloped areas is wildlife habitat, recreation, aquaculture, fishing, and hunting. Oil and gas production is common.

Existing Habitat

Information on the habitat for the green diesel project area, including the surrounding wetlands, was obtained from a Biological Investigation Report by the LDNR (LDNR 2008). According to LDNR, the undeveloped areas in the vicinity of the site are freshwater cypress swamp. The wetland habitat in the vicinity of the site supports furbearers, deer, alligators and native and migratory birds as well as sunfish, crawfish, grass shrimp, and shad. Due to prior disturbance and current industrial land use patterns, the project site and the lay down area do not contain any vegetation or wildlife habitat. These project components have previously been cleared of trees and all natural vegetation. The rail spur would traverse land owned by Valero that is required to be maintained clear of shrubs and trees and is periodically cleared of vegetation for third party access agreements associated with existing pipelines and right-of-way for the KCSRC. The majority of vegetation in the ROW is composed of alligator weed (*Alternanthera philoxeroides*). Other plant species present include bull-tongue arrowhead (*Sagittaria lancifolia*), cutgrass, big-pod sesbania (*Sesbania exaltata*), and maidencane (*Panicum hemitomon*).

ENVIRON personnel visited the plant site, rail spur and scale area, and laydown area in 2008 and in October of 2009 and determined that no habitat is present to support federally protected species due to previous disturbance and current land use as an industrial area.

Threatened and Endangered Species

The USFWS list includes species listed by the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS). Federal-listed species are designated by the USFWS and NMFS under the provisions of the Endangered Species Act (ESA) of 1973. The Louisiana Natural Heritage Program (LNHP) maintains a database on rare, threatened, and endangered species of plants and animals and natural communities for Louisiana. A detailed Element Occurrence Record, which includes precise locations, species population status, and habitat conditions and characteristics, is entered for each species occurrence in the LNHP

Biological Conservation Database. The LNHP reviews proposed projects for impacts to rare, threatened, or endangered species and critical habitats known from the LNHP Biological Conservation Database.

Table 3.13 lists the state and federal threatened and endangered species known to have the potential to exist in St. Charles Parish (USFWS 2010 and LNHP 2008). Inclusion on the following lists does not imply that a species occurs in the proposed project area, but only acknowledges the potential for occurrence in St. Charles Parish.

Table 3.13
State and Federal Threatened and Endangered Species of Potential Occurrence in St. Charles Parish

Common Name	Scientific Name	State Status	Federal Status	Habitat Description	Habitat present at site
Manatee	*Trichechus manatus*	E	E	Marine open water, bays, and rivers with submerged or floating vegetation	No
Bald Eagle	*Haliaeetus leucocephalus*	E	D	Cypress trees near open water	No
Pallid Sturgeon	*Scaphirhynchus albus*	E	E	Excessively turbid rivers in areas with strong currents over firm sandy bottom	No
Gulf Sturgeon	*Acipenser oxyrhinchus desotoi*		T	All saltwater habitats, spawns in large rivers	No

D = delisted, E = endangered, P = prohibited, T = threatened

3.7.2 Environmental Consequences

Proposed Action

The green diesel project is not expected to fragment or otherwise alter any existing wildlife habitats within the region. Because of the existing surrounding industrial activities and because the proposed plant site and laydown area have previously been disturbed, filled and graded, they are not favorable for wildlife habitat. Therefore no impacts, either temporary or permanent, are expected. The right-of-way is regularly cleared of vegetation, and any species potentially affected by rail spur and railcar scale construction would be common to the area and would be able to relocate to other nearby areas that offer the same type of habitat mix. Impacts to wildlife and their habitat would be negligible.

The increased noise and activity levels during construction could potentially disturb breeding or other activities of urban species inhabiting the areas adjacent to the construction area. Given that the size and nature of the green diesel plant industrial activities are minor compared to existing petrochemical complexes already operating in the surrounding area, noise would not be expected to have additional impact on wildlife beyond impacts already present when the proposed facility is in operation. Transient wildlife (furbearers, deer, alligators and native and migratory birds) surrounding the project area have ample habitat to move to during construction and operation. Based on a site evaluation, the site does not contain unique vegetation, fish, or wildlife and is therefore not expected to impact any of these resources. No habitat is present to support federally protected species due to previous disturbance and current land use as an industrial area; therefore no federally listed threatened or endangered species or critical habitat would be impacted by the proposed project. The Louisiana Natural Heritage Program determined that based on a review of their database, no impacts to rare, threatened, or endangered species or critical habitat are anticipated for the proposed project. USFWS also determined that the proposed project would have no effect on federally listed threatened and endangered species or their habitat. Letters from both agencies are contained in Appendix A.

In addition, no new vegetation removal or clearing is expected because the entirety of the site and the laydown area have been previously graded and disturbed. Construction of the rail spur/railcar would result in the removal of vegetation that is regularly cut and maintained as a right-of-way. Therefore, no Migratory Bird Treaty Act compliance issues associated with vegetation removal during the nesting season are expected.

No Action Alternative

There would be no impacts on biological resources under the No Action Alternative because the Project would not occur. Existing industrial land uses at the green diesel project site would continue.

3.8 Cultural Resources

3.8.1 Affected Environment

A review of records for St. Charles Parish was performed using the online mapping and search tools provided by the Louisiana Office of Cultural Development (2009). Six properties within the parish are on the National Register of Historic Places. The closest site is the Kenner and Kugler Cemeteries Archaeological District, over 2 mi from the proposed project location. There are no known cultural, archaeological, or historic resources associated with the property; however, the site has not been archaeologically or historically surveyed.

3.8.2 Environmental Consequences

Proposed Action

Based on a review of records and site conditions, there are no known cultural, archaeological, or historic resources associated with the property, including the

laydown area. Prior ground disturbance is likely to have uncovered any potential cultural or historical resources that may be present; therefore, the proposed project is not expected to have any indirect or direct effects on cultural or historical resources. The Louisiana State Historic Preservation Office concurred with DOE's finding of no historic properties affected for the proposed project (Appendix A).

No Action Alternative

No impacts to cultural resources would occur under the No Action Alternative.

3.9 Socioeconomics and Environmental Justice

3.9.1 Affected Environment

Demographic and Economic Characteristics

As of 2000, the estimated population of Norco, Louisiana was 3,579, which has increased by approximately 5.7% since 1990. The 2000 Census reported the population of St. Charles Parish as 48,072, which has increased by approximately 29% since 1980. The population of Louisiana has increased by 6.3% since the 1980 Census. Table 3.14 summarizes Census data from 1980 through 2000, where available, the 2008 population estimate (estimated for the 2010 Census), as well as population growth data (U.S. Census Bureau 2000).

Table 3.14
Historical Population 1980-2000

Location	1980 Census	1990 Census	2000 Census	2008 Population Estimate	Growth Rate 1980-1990	Growth Rate 1990-2000	Growth Rate 1980-2000
Norco, Louisiana	NA	3,385	3,579	NA	NA	5.73%	NA
St. Charles Parish	37,259	42,437	48,072	51,547	13.90%	13.28%	29.00%
Louisiana	4,205,900	4,219,973	4,468,976	4,410,796	0.33%	5.90%	6.30%

Source: U.S. Census Bureau, 1980, 1990, 2000

As of the 2000 Census, there were 1,847,181 housing units in Louisiana, an increase of 7.6% since 1990 (1,716,241 housing units). In 2000, approximately 67.9% of the housing units were owner-occupied (roughly 1.5% higher than the national average), and 10.3% were vacant (roughly 1% higher than the national average). The number of vacant housing units in Louisiana decreased by 11.9% from 1990 to 2000. In St. Charles Parish, according to the 2000 Census, there were approximately 19,760 housing units and 92.1% of the units were occupied. The median value of a home in St. Charles Parish in 2000 was $163,300, roughly 15% lower than the national

average cost of a home. In 2000, there were approximately 1,420 housing units in Norco, Louisiana and the median value of a home in Norco was $87,500, which was roughly $32,000 less than the national average at that time (US Census Bureau 2000).

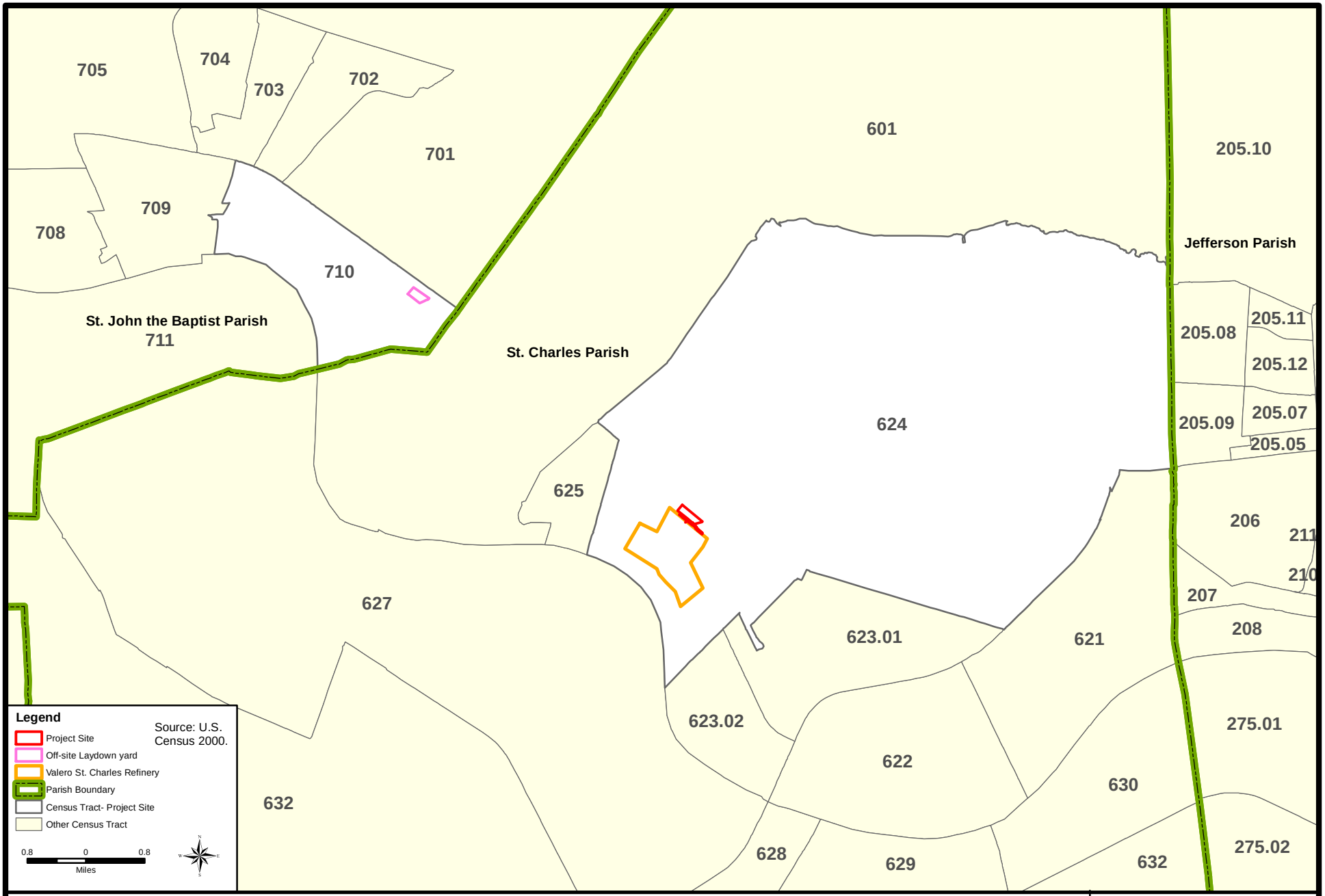
According to the 2000 Census, approximately 59.4% of the Louisiana population was employed (which was relatively unchanged since 1990), and the unemployment rate was 7.3% (over a 2% decrease since 1990). Compared to the national average, Louisiana's labor force is smaller and the unemployment rate is larger (63.9% and 5.8%, respectively). The median per capita income in Louisiana was $39,399 in 2000, with the primary occupations being in the management and professional fields, as well as service, sales, and office occupations. In St. Charles Parish, approximately 65% of the population was employed (which was roughly the same as the national average of 64%). The median per capita income in St. Charles Parish is $19,054. The primary occupations included management and professional occupations as well as sales, office, production, transportation, and material moving occupations. Based on the 2000 Census data, Norco had a labor force of 1,495 workers (53.1% of the population). The median per capita income was $17,065, and the primary occupations included sales and office occupations, as well as service, production, transportation, and material moving occupations (US Census Bureau 2000).

Based on 2000 Census data, the majority of people in the state of Louisiana are White persons (65%), followed by Black persons (32%), and Hispanic persons (3%). Approximately 14% of families are below the poverty line (19% of individuals), which is higher than the national average of 10% of families and higher than the national average of individuals (13%). In St. Charles Parish, the majority of people are White persons (70%) followed by Black persons (28%), and Hispanic persons (4%). Approximately 10% of families and 11% of individuals are below the poverty line. According to the 2000 Census, the majority of people in Norco are White persons (80%), followed by Black persons (19%), and Hispanic persons (2%). In Norco, 9% of families and 11% of individuals are below the poverty line. The green diesel project site is located within Census Tract 624. Adjacent Census Tracts include Tracts 601, 625, and 627 (US Census Bureau 2000). Table 3.15 presents information on percent minority, percent of individuals below the poverty line, and the median income for the proposed project site and adjacent Census Tracts. Figure 3.3 shows the location of the Census Tracts.

Table 3.15
Environmental Justice Data

Location	Percent Minority	Percent of Individuals Below Poverty Line	Median Income
Census Tract 624 (Project Site)	50%	20%	$28,482
Census Tract 627	61%	26%	$35,789
Census Tract 625	21%	11%	$37,326
Census Tract 601	19%	9%	$48,388
Norco, Louisiana	20%	11%	$37,270

Based on this review, the project site (624) and one adjacent census tract (627), have a higher percentage of minorities than the other surrounding census tracts and Norco as a whole. These two tracts (624 and 627) have a greater percentage of individuals below the poverty line than the Louisiana statewide and national averages, while the remaining two census tracts are lower than the statewide and national averages for individuals below the poverty line.



Census Tracts
Diamond Green Diesel Project
Norco, LA

Figure
3.3

Environmental Justice

In February 1994, President Clinton issued Executive Order 12898 Federal Actions to Address Environmental Justice in Minority and Low-Income Populations (59 FR 7629 [Section 1-201]). This order requires that "each federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities, on minority populations and low-income populations."

CEQ has issued guidance to federal agencies to assist them with their NEPA procedures so that environmental justice concerns are effectively identified and addressed. The guidance provides information on how to interpret the key terms and criteria to consider when determining whether health or environmental effects are disproportionately high and adverse. These include whether the effects are significant or above generally accepted norms, whether the environmental effects, health risk, or rate of exposure of a minority or low income population is significant and appreciably exceeds or is likely to appreciably exceed those on the general population, and whether effects occur or would occur in a minority or low income population affected by cumulative or multiple adverse exposures from environmental hazards (CEQ 1997).

3.9.2 Environmental Consequences

Proposed Action

Employment and Population

During construction, a temporary increase in workers resulting from an average of approximately 300 construction workers and up to 630 workers during peak construction activity is expected. The bulk of these workers are expected to already be present in the surrounding area due to the ongoing expansions in the petrochemical sector in the area. During operations, 31 permanent jobs would be created, which are expected to be filled by the existing technical skill base in the area. The project is not expected to have an impact on the surrounding population.

Environmental Justice

Compared to the green diesel project site (Tract 624), one census tract adjacent to the VSCR (Tract 627) contains a higher number of minority populations. Other surrounding census tracts (625 and 601) and Norco as a whole contain lower minority populations than the project site tract. Based on the impact analyses presented in Section 3.0 of this document, construction and operation of the Diamond green diesel project would not result in a disproportionately high and adverse impact to the health of the minority and low-income population of the surrounding community. In addition, construction and operation of the proposed project would not result in a disproportionately high and adverse impact to the natural or physical environment that affects this minority and low-income population.

No Action Alternative

No impacts on population or employment or impacts to surrounding minority and low income populations would occur under the No Action Alternative and no new jobs would be created as a result of the project.

3.10 Utilities

3.10.1 Affected Environment

The green diesel plant would utilize electricity, natural gas, and potable water received via pipe across the new piperack. VSCR and other industrial customers in the area receive electricity from Entergy Louisiana, LLC. Natural gas is supplied by ATMOS and potable water is provided by St. Charles Parish Waterworks.

Electricity

Electricity would be provided to the proposed project by Entergy Louisiana, LLC. VSCR's average annual electricity usage for 2007 and 2008 was 971,326 MWH, or 110.9 MW.

Natural Gas

Natural gas is supplied via the Gulfsouth Pipeline through two existing meters at VSCR: a refinery fuel meter and a hydrogen plant meter. VSCR uses natural gas both as a feedstock to the hydrogen plant and as a fuel to refinery processes. VSCR annual average natural gas fuel usage for 2007 – 2008 was approximately 5,281,000 thousand cubic feet (MCF).

Potable Water

Potable water is provided to VSCR by St. Charles Parish Waterworks, and their water source is the Mississippi River. The Mississippi River is the principal surface water source of all municipal, industrial, and agricultural use for towns and water districts downstream of Baton Rouge, Louisiana. The St. Charles Parish East Bank treatment capacity is 7 million gallons per day (MDG). The average production is 4.4824 MGD. Maximum Daily Production was 6.5354 MGD, occurring in 2000. VSCR average annual usage of potable water for 2007 and 2008 was 38,006,893 gallons, or 104,128 GPD.

Sanitary Wastewater

Sanitary wastewater treatment for the area is provided through the St. Charles Parish Department of Public Works and Wastewater, which maintains and operates several wastewater treatment plants in the Parish. The VSCR sanitary wastewater discharge is routed to the Destrehan Wastewater Treatment Plant (WWTP), which services the East Bank of the Mississippi River in St. Charles Parish, including Destrehan, Montz, Norco, New Sarpy, and St. Rose. The Destrehan WWTP has a design capacity of 4.4 MGD.

Wastewater

VSCR operates a WWTP that is comprised of the following main components: an equalization tank, a Dissolved Gas Flotation process, an activated sludge aeration basin system, and polishing ponds. Annual flow in 2008 to the VSCR wastewater treatment unit was approximately 1700 gpm. The VSCR WWTP would treat wastewater from the proposed project, thus acting in the capacity of a wastewater utility.

VSCR discharges wastewater to the Mississippi River and Bayou LaBranche under LPDES Permit LA0052051, which was renewed by the LDEQ on November 21, 2008. The permit authorizes Outfall 001 to discharge process wastewater, condensate, boiler blowdown, hydrostatic test water, first flush process area storm water, cooling tower blowdown, tankage, Belco effluent, Alkylation Unit effluent, service water, and softener regeneration water to the Mississippi River. Filter backwash and clarifier blowdown from the river intake water clarification plant is released to the Mississippi River via Outfall 005. Non-process area storm water and the following miscellaneous wastewaters drain to Bayou LaBranche via Outfalls 002, 003, 004, 006, and 007: fire system test water, eye wash and safety shower water, steam trap blowdown, and previously tested hydrostatic test wastewater from Internal Outfall 102

Outfall 001 is estimated to discharge a maximum of 4.6 MGD. The permittee must monitor the effluent characteristics of Outfall 001, including pH, BOD, total suspended solids (TSS), oil and grease, chemical oxygen demand (COD), ammonia, sulfide, phenolic compounds, and chromium. Specific discharge limitations are listed within the permit. Toxicity testing must be performed annually. Outfalls 002, 003, 004, 005, 006, and 007, which do not come into contact with process wastewater, are monitored for flow, total organic carbon, oil and grease, and pH. Additional parameters monitored for Internal Outfall 102 include TSS, benzene, BTEX (benzene, toluene, ethylbenzene, and xylene), and lead.

3.10.2 Environmental Consequences

Proposed Action

Electricity

The green diesel plant electricity demand would be approximately 4MW. Electric power would be transmitted via a cable that would be run from the Entergy substation located at VSCR across the new piperack. Diamond would be a direct customer of Entergy Louisiana. In a letter from Entergy dated November 12, 2009, Entergy accepted Diamond's application for electrical service and stated that the 4MW required by the proposed project would only increase the total utility demand by 0.0188%.

Natural Gas

The green diesel plant would use natural gas as fuel for the flare pilot and for the two small process heaters. Natural gas would be supplied from VSCR via a 600 pounds per square inch (psig) pipeline at a rate of approximately 30 MMBtu/hour. The flare pilot would burn continuously to maintain readiness for any emergency situation, with a fuel consumption of approximately 0.21 MMBtu/hr. The projected green diesel plant demand is well within the available supply and would not impact the existing infrastructure.

Potable Water

The potable water demand for the green diesel project would be met by a pipe across the new piperack tied into the VSCR potable water supply. The American average daily per capita residential household water consumption is 69 gallons per day (gpd), of which 28 gpd is attributed to showers, baths and clothes washers (American Waterworks Association, 2009). The green diesel plant would create 31 new jobs. Using a conservative estimate of 40 gpd water consumption for each worker, the green diesel plant would utilize approximately 1,240 gpd, or 0.0012 MGD, potable water. This represents only 0.05% of the unused capacity of the East Bank treatment facility. The St. Charles Parish Waterworks has sufficient capacity to meet the projected demand.

Sanitary Wastewater

Sanitary wastewater discharge from the green diesel project would be transferred via pipeline across the new piperack to a tie-in with the existing VSCR sanitary wastewater treatment line that routes to the Destrehan Wastewater Treatment Plant. Estimated rate of sanitary wastewater discharge from the green diesel plant is approximately 620 gallons per day (gpd), based on 31 workers and 20 gpd per worker. This is a small percentage (approximately 5%) of the total volume of VSCR sanitary wastewater discharge reflected in the Destrehan LPDES permit (13,000 gpd) and less than 0.02% of the permitted design capacity of the Destrehan WWTP (4.4 MGD). The Destrehan Wastewater Treatment Plant has sufficient capacity to treat the projected discharge.

Wastewater

Approximately 39 gpm of wastewater would be generated from the green diesel plant. Prior to sending wastewater to the VSCR WWTP, it would be pretreated using an oil/water separator, a DAF unit and biological treatment to remove traces of fats and most solids, resulting in an 80% reduction in BOD and COD of this effluent. The green diesel project would discharge via the VSCR permitted outfalls described above and be subject to the same effluent guidelines and permit conditions, which were comprehensively reviewed and established in the 2008 permit renewal by LDEQ.

The 2008 actual annual flow rate to the VSCR WWTP was approximately 1700 gpm. VSCR's current LPDES permit is based on an estimated 2481 gpm flow to the treatment plant in dry weather and 3175 gpm in wet weather. Based on this information, the VSCR wastewater treatment plant has about 30% unused capacity. The additional wastewater flow from the green diesel project represents approximately a 3.5% increase in the actual average daily flow, and approximately 2.4% of the permitted dry weather basis capacity. The green diesel project therefore would not affect the existing infrastructure for wastewater treatment capacity. Other than the tie-in, there are no modifications required at VSCR WWTP to accept this new wastewater stream.

No Action Alternative

Under the No Action Alternative there would be no impact to existing utilities.

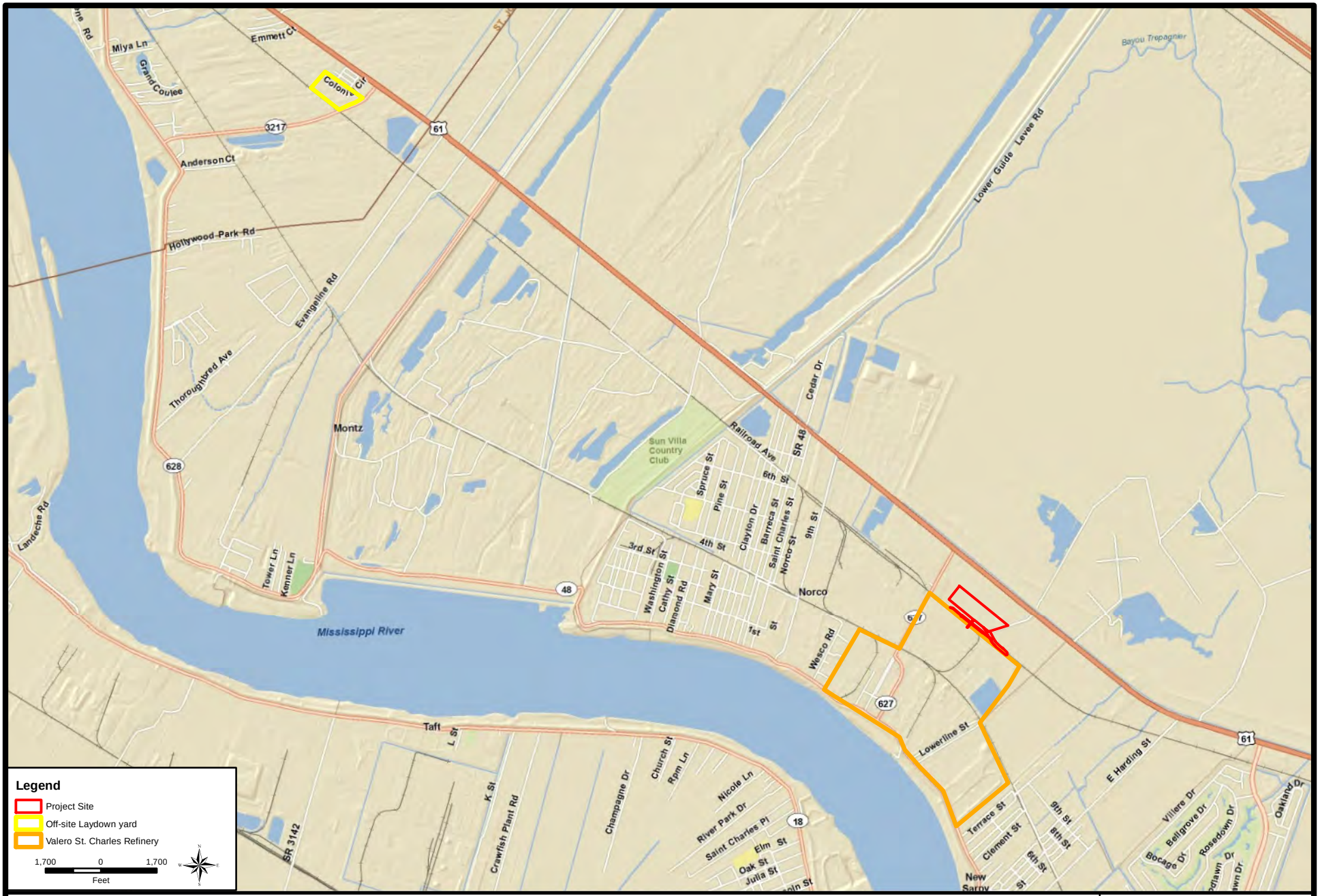
3.11 Transportation

3.11.1 Affected Environment

A combination of primary, secondary and access roads provide surface transportation to the off-site laydown yard and the green diesel plant site. Airline Highway is the primary artery between both locations. Prospect Avenue facilitates access to the existing VSCR from Airline Highway, and an unnamed access road from Airline Highway provides access to the green diesel project site. Airline Highway is a four lane highway running northwest to southeast. Prospect Avenue is a two lane road that runs perpendicular to Airline Highway (northwest of the green diesel plant), and the access road off of Airline Highway provides access to the southeast corner of the green diesel plant. Figure 3.4 depicts the roadways near the plant site.

The Louis Armstrong International Airport is located approximately 9 mi east of the green diesel plant off of Airline Highway. Rail transportation in the vicinity includes the KCSRC and the Illinois Central railroads.

The Mississippi River is another main avenue of transport in the area. VSCR, located south of and adjacent to the green diesel plant, has three docks for the receipt and transport of feedstock and products.



Local Roadways
Diamond Green Diesel Project
Norco, LA

Figure
3.4

3.11.2 Environmental Consequences

Proposed Action

Construction

The proposed project construction would generate temporary traffic impacts due to vehicle trips from construction workers. Proposed construction of the green diesel plant would begin in May 2011 and continue through October 2012. The number of construction workers is projected to average 300 during the construction period, up to 630 during the peak month, and down to 50 during the lowest month. During construction, the workers would park personal vehicles at the offsite laydown yard and would be bused to the green diesel plant site daily. On average, one car per worker would be traveling to the laydown yard, which is located approximately 2 mi northwest of the site along Airline Highway. It is estimated that between 8 and 24 bus trips per day would be made to and from the laydown yard and the site. In addition to the buses transporting construction workers, heavy construction vehicles would primarily access the site from Airline Highway via the access road or via Prospect Avenue, which runs through VSCR. Upon reaching the site, the heavy construction vehicles would remain for the entire facility construction duration, and therefore would not be making daily trips to and from the site.

Airline Highway would see the greatest in increase in traffic from the proposed project. According to the LDOT (http://www.dotd.la.gov/highways/tatv/default.asp), the 2007 average daily traffic count (ADT) at Station 225070 along Airline Highway between the offsite laydown yard and the green diesel plant site is 23,282 vehicles. Construction traffic is estimated to represent less than 4% of 2007 ADT based on peak conditions. Airline Highway is a paved four lane roadway and is able to accommodate this increase in traffic with minimal impacts anticipated.

Operation

The proposed facility would generate vehicle trips from facility operations and employees. Approximately 52 new employees would be traveling to and from the site once the facility is fully operational. It is expected that the relative impact from the increase in employee traffic would be minimal.

In addition to the 52 permanent employee's personal vehicles, approximately 10 trucks per day would access the green diesel plant site via VSCR (Prospect Avenue, Route 627) or via the access road off of Airline Highway for material deliveries and waste disposal. This increase of approximately 62 vehicles per day represents less than 0.4% of the 2007 average daily traffic count, therefore minimal impacts from traffic are anticipated. Potential impacts are minimized by the use of the existing highway infrastructure, including access points, thereby eliminating the need for disturbance of undeveloped properties to construct roads.

Collocation with the existing VSCR facilities minimizes the need to transport a variety of wastes and materials, thus minimizing traffic during operation. VSCR would provide process inputs including hydrogen, nitrogen, water, caustic, rich amine, and natural gas. In addition, VSCR would directly receive all product output of the green diesel plant, thereby eliminating transportation impacts that would occur if the facility were located remote from the customer.

Receipt of raw material, filter aid and citric acid would occur by truck or rail. Bleaching earth would be received by rail. Solid waste, including spent clay filter material, sludge and miscellaneous non-hazardous wastes, would be transported from the site by truck. The potential rail and truck traffic associated with the transport of these materials has been estimated and is shown in Table 3.16. For purposes of estimating the number of vehicles, the analysis in the table below assumes all filter aid and citric acid would be received by truck and all raw materials would be received by rail. The existing highway and rail infrastructure supporting the industrial area surrounding the project site can accommodate this small increase in traffic and any transportation impacts would be minor.

Table 3.16
Transport of Materials to and from the Green Diesel Plant via Rail and Truck

Material	Railcars or Trucks per Day	Railcars or Trucks per year
Raw Material (fats and oils)	20 railcars	5,000 railcars
Bleaching Earth	< 1 railcar	177 railcars
Filter Aid	< 1 truck	188 trucks
Citric Acid	< 1 truck	213 trucks
Spent cake	5 trucks	1,350 trucks
Sludge	3 trucks	588 trucks
Miscellaneous solid waste	<< 1 truck	73 trucks

No Action Alternative

No impacts on traffic patterns or congestion would be expected under the No Action Alternative and there would be no change to existing conditions.

3.12 Waste Management

3.12.1 Affected Environment

Waste management encompasses the generation, treatment, and disposal of solid and hazardous wastes and materials that may be used or generated by the project. Waste may be treated and disposed of onsite, or may be transported offsite for treatment and disposal at a facility appropriately designed and permitted for the type of waste received.

3.12.2 Environmental Consequences

Proposed Action

Construction

Solid waste generated during the construction phase would include typical construction debris, which would be collected and disposed of in a properly permitted landfill. Construction activity solid wastes typically include construction materials for buildings, concrete and asphalt rubble, and land-clearing debris. It is estimated that the solid waste generation rate during nonresidential construction activities in the US is 3.89 pounds per square foot of property developed (USEPA 1998). Using this formula, the maximum estimated quantity of construction and demolition waste generated from construction was estimated as follows:

Construction: [(3.89 lbs/ft2) x (871,200 ft2)] ÷ 2,000 lbs = 1,694 tons

For the green diesel project, the land at the construction site has already been cleared, therefore minimal or no soil and wood waste from land clearing is anticipated. Therefore, the above estimate of total construction debris for the project is expected to be high. Other miscellaneous construction debris may be generated and require disposal.

Operations

Operation of the green diesel plant would generate non-hazardous industrial solid waste, primarily consisting of sludge from wastewater pretreatment and spent filter cake from the raw material pretreatment process. No hazardous wastes would be generated by the green diesel plant.

Table 3.17 summarizes the estimated solid waste generation by type.

Table 3.17
Green Diesel Plant Annual Industrial Solid Waste Generation Summary

Material	Pounds per Year
Spent Filter Cake	27,000,000
Wastewater sludge	11,764,000
Miscellaneous solid waste	2,190
Total	**38,766,190**

Waste Disposal

All solid waste from construction and operation would be disposed of at approved and permitted landfills. There are several permitted landfills with adequate capacity in the area.

Diamond has identified the Woodside Landfill, operated by Waste Management and located approximately 67 mi from the proposed project site, as the likely recipient of

waste for disposal. Based on communications with Mr. Glenn Robertson, Industrial Account Manager, Waste Management, the Woodside Landfill manages 795,000 tons of waste annually and is the largest disposer of industrial waste in Louisiana. Waste Management estimates that the Woodside Landfill has approximately 40 – 50 years of remaining capacity.

Two additional possible disposal sites for the green diesel project waste are the Jefferson Parish Landfill, also operated by Waste Management, and the River Birch Disposal Facility, both in Avondale, Louisiana, approximately 25 mi from Norco, Louisiana. The River Birch Disposal Facility is a new landfill that commenced operation in 2005, with several decades of capacity available.

No Action Alternative

Under the No Action Alternative, no construction waste or waste from operation of the green diesel plant would be generated. Waste generation from existing sources and activities in the area would continue.

3.13 Public and Occupational Health and Safety

Public and occupational health and safety concerns relate to both construction activities and operations at the green diesel plant site. Public health concerns include compliance with the Emergency Planning and Community Right to Know Act (EPCRA) related to potential accidents, spills, or releases at the green diesel plant site that may affect public health. Occupational health and safety relates to the safety of on-site workers during construction and operation, which is regulated by OSHA.

3.13.1 Affected Environment

Existing conditions in the affected environment addressing public and occupational health and safety include both public services and programs and systems at the adjacent VSCR. The adjacent VSCR is an OSHA Star site, indicating a worksite with comprehensive, successful safety and health management systems, injury and illness rates at or below the national average for the industry, and self-sufficiency in their ability to control workplace hazards.

VSCR complies with OSHA occupational safety and health standards pursuant to 29 CFR 1910 for hazardous materials (including process safety management and emergency response), fire protection, and toxic and hazardous substances (including hazard communication). The primary focus of the process safety management (PSM) program is the prevention of and minimization of consequences related to catastrophic releases of hazardous chemicals through engineering design, maintenance, and administrative management systems. The PSM program includes periodic process hazard analyses to protect the health and safety of the public and onsite personnel, maintaining operating procedures, training employees, and a comprehensive program to manage the mechanical integrity of process equipment.

The hazard communication program includes prescribed container labeling, warning signs and systems, and regular employee training.

VSCR maintains an Emergency Action Plan to ensure the safety of the public and employees and contractors in the event of any natural or manmade emergency. The plan includes roles and responsibilities of designated responders, procedures for emergency response, and procedures for notification to outside agencies and the media.

The VSCR emergency response team consists of 110 volunteers selected from site employees. At least fifteen team members and one supervisor are present on each shift. Approximately 45 team members are trained in hazardous materials. The team conducts regular meetings, field exercises including actual fire evolutions, and annual off-site training.

The VSCR fire system includes three fire water pumps with a total pumping capacity of 7,500 gallons per minute supplied from two 1.5 million gallon fire water ponds. The facility is equipped with fire extinguishers, fire hydrants, and freestanding fire water monitors at critical locations. On-site firefighting equipment includes five fire trucks, two trucks with mobile fire water monitors, truck and trailer units with fire hose, and a rescue response vehicle. On-site inventory of approximately 22,000 gallons of fire fighting foam can be supplemented by the mutual aid group.

The VSCR is a member of the local mutual aid organization for the St. Charles Parish. Responding members act as support for the local emergency response team and incident commander. Response time is estimated at 15 to 20 minutes for initial arrivals.

The VSCR employs a contract security force to act as perimeter guards on the property. Due to its location on the Mississippi River, VSCR is also subject to security provisions pursuant to the Maritime Transportation Security Act (MTSA). These heightened security requirements reduce risk of intentional acts of destruction.

Public Police Protection and Emergency Response Services

Public police protection and law enforcement services for the local area are provided by the St. Charles Parish Sheriff's Office, headquartered in Hahnville (http://stcharlessheriff.org). The Patrol Department includes 68 deputies that are assigned to various units. The Sheriff's Office also houses the 9-1-1 Communications Center, a Public Safety Answering Point (PSAP) and dispatch center with a staff of 25 employees operating 24 hours a day, providing both non-emergency and emergency medical, fire, and law enforcement response for St. Charles Parish. In 2009, the St. Charles Parish Communications Center processed 170,104 calls, including 1,655 calls for fire services, 5,311 calls for medical services and 54,782 calls for sheriff's office services. Communications Specialists are certified in Emergency Medical Dispatch by the National Academies of Emergency

Dispatch and receive continuing dispatch education throughout the year on various dispatch topics.

Public Fire Protection Services

St. Charles Parish public fire protection services are comprised of a network of ten local fire departments, with the closest to the proposed project site being the Norco Fire Department, Fire District #4, located at 621 West B Street in Norco, LA.

Medical Services

St. Charles Parish Hospital, located in Luling, is a 59 bed acute care facility that offers outpatient, inpatient, surgical, and emergency medical services. St. Charles Parish Hospital is fully accredited by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO)**.** The St. Charles Community Health Center, a federally qualified health center also located in Luling, provides skilled medical care for the residents of the parish, including pediatric, women's health, adult services, and behavioral health services. There are also a number of other medical facilities in the region, including Thibodaux Hospital and Health Centers, Kenner Regional Medical Center, and River Parishes Hospital.

3.13.2 Environmental Consequences

This section presents an analysis of proposed project construction and operation related to public and occupational health and safety. The implementation of best management practices is designed to reduce the likelihood of harm to people or property.

Proposed Action

Construction

Construction of the proposed project would pose the normal risks associated with construction that stem from the use of heavy equipment. Access by the general public to the construction site would be prohibited. All activities during construction of the proposed green diesel project would comply with OSHA requirements, reducing potential impacts to workers and the public.

Operations

All activities during operation of the proposed green diesel project would comply with OSHA requirements, reducing risk of impacts. Feedstock oils have low toxicity and high flash points (>450°F), posing low risks of fire or personal injury. Raw material hydrogen and co-product light ends gas are extremely flammable and may act as simple asphyxiants. The product, green diesel, and co-product, LPG/naphtha, are flammable. All process material hazards are comparable to those managed routinely in the motor fuels manufacturing industry. Occupational and public health and safety

risks attributable to the green diesel project operations are described in Table 3.18. This table identifies potential risks and describes the engineering and administrative controls that would be put in place during construction and operation in order to minimize risks to workers and the general public.

Table 3.18
Public and Occupational Health and Safety Risks

Risk Description	Engineering Controls	Administrative Controls
Process upset could lead to process vessel overpressure or loss of containment, which could lead to consequences listed below.	Use of a distributed control system (DCS) to provide continuous automatic control for process operation. The DCS incorporates an alarm system to alert operators of potential out-of-range parameters.	Automatic controls continuously monitored by operators trained on, and with immediate access to, operating procedures for nonstandard conditions.
Process vessel overpressure could result in explosion or loss of containment. Overpressure effects from an explosion would pose minimal risk to the general public because of distance.	Use of relief valves to protect process equipment from overpressure. Process designed to de-inventory vessels via a flare system designed to remove and safely combust organic compounds.	Process safety managed in accordance with generally accepted good engineering practices, including analysis of process hazards, documented operating procedures, operator training, mechanical integrity monitoring, change management, and emergency planning.
Loss of containment of hydrogen or light ends gas could result in a fire. A fire would pose minimal risk to the general public because of distance.	Hydrogen and light ends gas are not stored in the unit. Use of emergency shut-off valves on pipelines transferring hydrogen and light ends gas to isolate the unit in an emergency. Static and mobile fire protection equipment to respond to a fire.	Contractual arrangement with VSCR for emergency response services. Incorporation into the VSCR Emergency Action Plan.
Loss of containment of liquid hydrocarbons could result in a fire. A fire would pose minimal risk to the general public because of distance.	Secondary containment for storage tanks capable of holding the volume of the largest tank in the containment area and isolating spilled hydrocarbons from adjacent areas. Static and mobile fire protection equipment to respond to a fire.	Contractual arrangement with VSCR for emergency response services. Incorporation into the VSCR Emergency Action Plan.
Loss of containment of liquid hydrocarbons from process equipment, storage tanks, or unloading operations could result in a release of hydrocarbon to soil or water.	Process equipment would be protected from overpressure by relief valves. Storage tanks would be equipped with secondary containment capable of holding the volume of the largest tank in the containment area. Critical areas would be paved to facilitate spill remediation activities.	A Spill Prevention Control and Countermeasures plan for the Green Diesel facility addressing employee training, procedures for rail car and storage tank operation, provision of secondary containment to control spilled material, and spill response planning.

Intentional Acts

The green diesel plant would not utilize or store materials of the nature and quantity that would make the facility a likely or successful target for terrorist activities or other intentional acts of destruction. Nonetheless, Diamond would employ security measures to restrict access to unauthorized persons and to screen authorized personnel entering the plant.

Police Protection Services

Public services with respect to police protection are not expected to be impacted as a result of the project; there would be negligible or no increase in demand for police services. Perimeter security and access control would be provided by a perimeter fence, gates, security lighting, and the VSCR contract security force to prohibit access by the general public.

Fire Protection Services

Public services with respect to fire protection are not expected to be impacted as a result of the project; there would be negligible or no increase in demand for fire protection services. Emergency and firefighting services for the project would be provided by the adjacent VSCR. The project would be connected to the VSCR fire system and be equipped with fire extinguishers, hydrants, and freestanding fire water monitors at critical locations. Operators would be trained as first responders and would be equipped with radios for direct communication with emergency response team personnel.

Medical Services

Public services with respect to medical facilities are not expected to be impacted as a result of the project; there would be negligible or no increase in demand for services at the St. Charles Parish Hospital or Community Health Center.

No Action Alternative

There would be no change to existing conditions and no impacts on public or occupational health and safety under the No Action Alternative.

3.14 Cumulative Impacts

Cumulative impacts are those that may result from the incremental impacts of an action considered additively with the impacts of other past, present, and reasonably foreseeable future actions. Cumulative impacts are considered regardless of the agency or person undertaking the other actions (40 CFR 1508.7; CEQ 1997) and can result from the combined or synergistic effects of actions that are minor when considered individually over a period of time.

This section describes potential cumulative effects of the proposed action. The primary goal of cumulative impact analysis is to determine the magnitude and significance of the environmental consequences of the proposed action as described in this EA, in the context of the cumulative effects of other past, present, and future actions. This cumulative effects analysis was based on the findings of direct and indirect impacts from the resources analyzed in Chapter 3 of this EA. This section presents the results of DOE's consideration of those impacts in combination with impacts of other projects in the vicinity of the proposed action that have occurred, are occurring, or might occur in the reasonably foreseeable future.

DOE collected and reviewed information on relevant past, present, and reasonably foreseeable future projects and actions that could result in impacts. DOE then reviewed available analyses and information about those projects to identify which projects were appropriate for inclusion in the cumulative impacts analysis. Air quality was identified as the only resource for which the proposed project could incrementally contribute to significant impacts.

Air Quality

Cumulative impacts to air quality are reviewed by LDEQ through the preconstruction air permitting process. Specifically, industrial sources must obtain a permit or other authorization to construct prior to commencing any construction or modification that would increase emissions of regulated air pollutants (LAC 33:III.501). Through the permit review process, the level of emissions increases are evaluated to assure no adverse impacts to human health or the environment would occur. If proposed increases are above the PSD significance levels established by EPA, an air quality impacts analysis including dispersion modeling is conducted to demonstrate compliance with the NAAQS and to demonstrate that allowable incremental increases in air pollution levels are not exceeded. When modeling of the emissions from a proposed project and other contemporaneous net emissions increases at the facility exceed established modeling de minimus thresholds, the air quality impacts analysis is expanded to include emissions from other sources within the "area of inclusion," an area defined by a radius from the source to the furthest impact greater than de minimus, plus 50 km.

As discussed in Section 3.3, Air Quality, Diamond applied for and obtained an air quality permit from LDEQ for construction and operation of the green diesel project. Proposed emissions increases resulting from the project are below PSD significance thresholds and no adverse impacts to air quality would result from the project. To further assess potential cumulative impacts to air quality, other recent, ongoing and planned projects in St. Charles Parish were considered.

Valero St. Charles Refinery (VSCR) Projects

VSCR is in the process of expanding the existing refinery operations under a PSD permit PSD-LA-619(M2), issued by LDEQ on February 8, 2007. The expansion plans include the construction of new units and the modification of existing sources

to increase the refining capacity of the facility. The PSD permitting review included an air quality impact analysis incorporating other sources in the area of inclusion, including facilities in St. Charles Parish as well as surrounding parishes, and demonstrated no adverse impact to air quality. On December 5, 2008, LDEQ issued Permit PSD-LA-619(M4), revising the scope of the refinery expansion project. The revised scope represented a significant reduction in permitted air emissions from the 2007 PSD permit, with a correspondingly reduced predicted air quality impact. The incremental increases associated with the green diesel project are small compared to the level of emissions increases for which the VSCR air quality impact analysis was conducted; therefore the cumulative impact of the green diesel plant and the refinery expansion is not expected to result in any adverse air quality impact.

In August 2010, VSCR submitted a PSD permit application to LDEQ to construct a new Hydrogen Plant. The air quality impact analysis (dispersion modeling) for the Hydrogen Plant project included the emissions increases associated with the recently permitted green diesel plant. The analysis demonstrated that air quality impacts from these combined increases are below the PSD significant impact thresholds; therefore, no cumulative impact to air quality would result. See Table 3.19 for a comparison of the modeling results to the relevant NAAQS.

Table 3.19
Air Quality Impact Analysis Results Compared to NAAQS

Pollutant	Averaging Period	Modeling Result H_2 Plant and Green Diesel Plant ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_2 (NO_X)	1-hr	6.4	188
	Annual	0.89	100
SO_2	1-hr	6.3	196
	3-hr	7.2	1,300
	24-hr	2.9	365
	Annual	0.86	80
CO	1-hr	139.9	40,000
	8-hr	88.5	10,000
PM_{10}	24-hr	1.4	150
$PM_{2.5}$	24-hr	0.9	35
	Annual	0.20	15

Other Projects

To assess the potential for cumulative air quality impacts from projects at facilities other than VSCR, a listing of air quality permits issued by LDEQ to facilities in St. Charles Parish from January 2008 through the second quarter 2010 was obtained. Within this time period, LDEQ issued a total of 91 permits or permit modifications to

other facilities in St. Charles Parish (excluding Diamond green diesel plant and VSCR). Of these, 25 actions were permit renewals or initial title V permits for existing sources. The permit actions included 65 administrative amendments, minor modifications or permits for minor sources, indicating no increases or increases generally below levels of concern for impacts to air quality. Only one permit during this timeframe authorized an initial PSD project with construction of new sources or modifications to existing sources resulting in emissions above the PSD significance thresholds. International Matex Tank Terminals (IMTT) received PSD Permit PSD-LA-736 in July 2008, authorizing the HFO Tank Project. The IMTT permit was subsequently modified in 2009 and again in 2010, with no change to permitted emission rates. A listing of pending PSD permit applications was also obtained from LDEQ's website in August 2010. No pending PSD permit applications for other facilities in St. Charles Parish were listed.

Table 3.20 shows green diesel plant permitted emission rates (Permit 2520-00158-V0) in relation to VSCR total permitted emissions (inclusive of the VSCR refinery expansion project), the IMTT HFO Tank PSD project emissions increases, and total actual emissions reported by all St. Charles Parish facilities to the LDEQ emissions inventory database for 2008. For VSCR actual emission rates in 2008 and 2009, see Section 3.3. Note that actual emissions are typically well below permitted emissions levels, though air quality analyses are performed based on permitted emissions.

Table 3.20
Comparison of Green Diesel Plant and
Other St. Charles Parish Emission Rates

Pollutant	Green Diesel Plant Permitted Emissions (tpy)	VSCR Permitted Emissions (including Expansion) (tpy)	IMTT 2008 PSD HFO Tank Permitted Project Increases (tpy)	St. Charles Parish 2008 Actual Emissions (tons)
CO	11.18	4607.35	37.44	9283
NO_X	4.68	2131.02	80.4	13852
PM_{10}	1.63	672.19	--	1659
SO_2	0.24	2574.07	34.89	8490
VOC	20.79	3127.21	94.08	7631

In summary, green diesel plant air emissions increases represent a small incremental increase to the total existing St. Charles Parish industrial air emissions, and to known planned, ongoing, or recent projects with increases above the PSD significance thresholds. Also, St. Charles Parish is currently in attainment with all NAAQS, and air quality impacts analyses associated with recent PSD projects demonstrate that no adverse air quality impacts would result from the proposed project in combination with recent, ongoing, or proposed projects. Based on these

considerations, minimal cumulative impacts are expected to occur as a result of the green diesel plant in combination with other increases in air emissions.

Greenhouse Gases and Global Climate Change

While the scientific understanding of climate change continues to evolve, the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report has stated that warming of the Earth's climate is unequivocal, and that warming is very likely attributable to increases in atmospheric greenhouse gases caused by human activities (anthropogenic) (IPCC 2007). The IPCC's Fourth Assessment Report indicates that changes in many physical and biological systems, such as increases in global temperatures, more frequent heat waves, rising sea levels, coastal flooding, loss of wildlife habitat, spread of infectious disease, and other potential environmental impacts are linked to changes in the climate system, and that some changes may be irreversible (IPCC 2007).

The release of anthropogenic greenhouse gases and their potential contribution to global warming are inherently cumulative phenomena. Greenhouse gas emissions from the proposed action are relatively small compared to the 8,026 million tons (7,282 million metric tonnes) of CO_2-equivalent greenhouse gases emitted in the U.S. in 2007 (EIA 2007) and the 54 billion tons (49 billion metric tonnes) of CO_2-equivalent anthropogenic greenhouse gases emitted globally in 2004 (IPCC 2007). However, emissions from the proposed action in combination with past and future emissions from all other sources would contribute incrementally to the climate change impacts described above. However, at present there is no methodology that would allow DOE to estimate the specific impacts (if any) this increment of climate change would produce in the vicinity of the facility or elsewhere.

Although the proposed action would contribute to cumulative increases in GHGs and related climate change when combined with other projects globally, any such contribution to negative cumulative impacts is expected to be offset by the positive impact of providing commercial scale production of green diesel and other green fuels. The green diesel project contributes positively to resolving climate change impacts in two ways. First, the green fuels produced by the proposed project would make an incremental contribution by displacing from the market an equivalent volume of fossil fuel. Section 3.3 provides an estimate of the incremental benefits provided by green diesel as compared to petroleum-based diesel. The estimated incremental benefit is approximately 1.6 million metric tons per year of CO_2e emissions. Second, the Diamond green diesel project would further the development and employment of fungible green fuel technology, contributing to a cumulative increase in availability of green fuels in the market beyond the nominal 10,000 bpd production of the Diamond facility.

4 Chapter 4 – LIST OF AGENCIES CONTACTED

Louisiana Department of Environmental Quality

Louisiana Department of Wildlife and Fisheries, National Heritage Program

Louisiana Office of Cultural Development, Deputy State Historic Preservation Officer

St. Charles Parish Planning and Zoning Commission

U.S. Fish and Wildlife Service, Lafayette Ecological Services Field Office

5 Chapter 5 – LIST OF PREPARERS

U.S. Department of Energy

Sharon Thomas
NEPA Document Manager
M.E.M., Environmental Management
B.S., Marine Science

Valero Energy Corporation

Allan A. Griggs, P.E.
Director, Environmental Services
M.E., Environmental Engineering
B.S., Chemical Engineering

ENVIRON International Corporation

Bliss M. Higgins
Principal
B.S., Professional Geology

Kimberly Suedkamp Wells
Manager
Ph.D., Wildlife and Fisheries Science
M.S., Fisheries and Wildlife Ecology
B.S., Renewable Natural Resources

6 Chapter 6 – LIST OF REFERENCES

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APPENDIX A

AGENCY CORRESPONDENCE

BOBBY JINDAL
GOVERNOR

State of Louisiana
DEPARTMENT OF WILDLIFE AND FISHERIES
OFFICE OF WILDLIFE

ROBERT J. BARHAM
SECRETARY
JIMMY L. ANTHONY
ASSISTANT SECRETARY

Date	August 19, 2010
Name	Bliss M. Higgins
Company	ENVIRON
Street Address	8235 YMCA Plaza Drive, Suite 300
City, State, Zip	Baton Rouge, LA 70810
Project	Diamond Green Diesel Project Valero St. Charles Refinery St. Charles Parish
Project ID	2312010
Invoice Number	10081909

Personnel of the Habitat Section of the Coastal & Nongame Resources Division have reviewed the preliminary data for the captioned project. After careful review of our database, no impacts to rare, threatened, or endangered species or critical habitats are anticipated for the proposed project. No state or federal parks, wildlife refuges, scenic streams, or wildlife management areas are known at the specified site within Louisiana's boundaries.

The Louisiana Natural Heritage Program (LNHP) has compiled data on rare, endangered, or otherwise significant plant and animal species, plant communities, and other natural features throughout the state of Louisiana. Heritage reports summarize the existing information known at the time of the request regarding the location in question. The quantity and quality of data collected by the LNHP are dependent on the research and observations of many individuals. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in Louisiana have not been surveyed. This report does not address the occurrence of wetlands at the site in question. Heritage reports should not be considered final statements on the biological elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. LNHP requires that this office be acknowledged in all reports as the source of all data provided here. If at any time Heritage tracked species are encountered within the project area, please contact the LNHP Data Manager at 225-765-2643. If you have any questions, or need additional information, please call 225-765-2357.

Sincerely,

Amity Bass, Coordinator
Natural Heritage Program

Department of Energy
Washington, DC 20585

August 25, 2010

This project has been reviewed for effects to Federal trust resources under our jurisdiction and currently protected by the Endangered Species Act of 1973 (Act). The project, as proposed,
(X) Will have no effect on those resources
( ) Is not likely to adversely affect those resources.
This finding fulfills the requirements under Section 7(a)(2) of the Act.

Acting Supervisor
Louisiana Field Office
U.S. Fish and Wildlife Service

Aug 30, 2010
Date

Mr. Jim Boggs
Field Supervisor
U.S. Fish and Wildlife Service
646 Cajundome Boulevard, Suite 400
Lafayette, LA 70506

Subject: **Notification of No Effect Determination for Diamond Green Diesel's Biodiesel Project in Norco, Louisiana**

Dear Mr. Boggs:

The Department of Energy (DOE) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act for a Federal loan guarantee to Diamond Green Diesel, LLC to support construction of a biomass-based green diesel facility adjacent to the existing Valero St. Charles Refinery (VSCR) in Norco, Louisiana. As part of the review process for this facility, DOE has determined that the proposed project will have no effect on Federally-listed threatened and endangered species or their habitat.

The proposed project would produce approximately 10,920 barrels per day of diesel from renewable biomass feedstock (animal fats and waste grease). The proposed green diesel project would be located approximately 20 miles upriver from New Orleans, Louisiana, in Norco, St. Charles Parish (latitude 29°59', longitude 90°23') (Figures 2.1 and 2.2). The project would be built adjacent to, but interconnected with, the existing VSCR. The plant site area was cleared, filled, and graded pursuant to a 2005 U.S. Army Corps of Engineers permit and has been used by VSCR for laydown, parking, and staging for approximately three years (Figure 2.2 and Picture 1).

The project would also include an offsite laydown yard of approximately 23 acres located approximately 2 miles northwest of the construction site along Airline Highway (Figure 2.1 and Picture 2). Diamond would utilize this area during the construction phase for parking and construction laydown. The entire site has been graded and limestone gravel covered and has been in use by Valero for the same type of activities (parking and storage of construction materials) since it was purchased in 2008.

The project would also include the area over which a new elevated piperack, new railspur, and new railcar scale would be constructed (Figure 2.2 and Pictures 3 and 4). The elevated piperack would originate within the 20-acre green diesel plant, extend over property owned by Valero where third-party underground pipelines and the Kansas City Southern Railway Company (KCSRC) railway are located, and tie into an existing elevated piperack within the VSCR. The estimated area coverage of the new piperack is approximately 0.2 acre. The new railspur would be constructed to connect the KCSRC railroad, which runs parallel to the southern boundary of

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the plant site, to the green diesel plant site. The spur would originate from a tie-in point to the southeast of the plant site and would extend diagonally to the northwest, traversing the same Valero-owned strip of property that houses the KCSRC right-of-way and third-party pipeline easements, entering the green diesel plant site at the southeastern corner. The new railspur would cover approximately 2.15 acres. In addition, a new railcar scale would be constructed running parallel to and alongside the existing KCSRC railroad south of the green diesel project site, impacting an estimated 1.1 acres within the existing KCSRC right-of-way. The scale would be used to weigh cars just before entering the plant. The property to be traversed by the piperack, rail spur, and railcar scale is required to be maintained and cleared as existing right-of-way for the KCSRC and other third party existing underground pipes.

Enclosed is the Fish and Wildlife Service list of threatened and endangered species in St. Charles Parish from the Lafayette Ecological Services Field Office web site. All of the species have specific habitat requirements that limit their occurrence. Due to the industrial and disturbed nature of the project sites, none of these species or suitable habitat is known to be present. Site visits conducted in 2008 and October of 2009 confirmed that no habitat is present to support federally protected species and no rare species were observed. Based on the information currently available, no Federally-listed or proposed threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS) are known to occur in the project area. In addition, the Louisiana Natural Heritage Program determined that based on a review of their database, no impacts to rare, threatened, or endangered species or critical habitat are anticipated for the proposed project (letter enclosed).

If you have questions regarding this project, please contact me at 202-586-5335.

Sincerely,

SR Thomas

Sharon R. Thomas
Environmental Protection Specialist

Enclosures

Department of Energy
Washington, DC 20585

July 8, 2010

No known historic properties will be affected by this undertaking. This effect determination could change should new information come to our attention.

Phil Boggan 7-28-10
Phil Boggan Date
Deputy State Historic Preservation Officer

Mr. Phil Boggan
Deputy State Historic Preservation Officer
Louisiana Office of Cultural Development
P.O. Box 44247
Baton Rouge, LA 70804-44247

Dear Mr. Boggan:

The Department of Energy (DOE) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act for a federal loan guarantee to Diamond Green Diesel, LLC (Diamond) to support construction of a biomass-based diesel facility adjacent to the existing Valero St. Charles Refinery (VSCR) in Norco, Louisiana. This letter is to request concurrence on a "finding of no historic properties affected" for the Diamond project on the basis of those materials required by 10 CFR Part 800.11d (1) through (3).

1) A description of the undertaking, specifying the Federal involvement, and its area of potential effects (APE), including photographs, maps, drawings, as necessary:

The proposed action evaluated by DOE in its EA is to issue a loan guarantee to Diamond for its biomass-based diesel facility adjacent to the existing VSCR in Norco, Louisiana (latitude 29°59', longitude 90°23'). The proposed facility would produce approximately 10,920 barrels per day of diesel from renewable biomass feedstock (animal fats and waste grease).

The APE includes a site of approximately 20 acres that would house the green diesel plant. The proposed plant would be located approximately 20 miles upriver from New Orleans, Louisiana, in Norco, St. Charles Parish (Figures 1, 2, and 3). The proposed plant would be built adjacent to, but interconnected with, the existing VSCR. The 20 acre site has been used by VSCR for parking and construction laydown for approximately three years and is bounded on the northwest and southwest by petroleum refining and chemical process units, including the existing VSCR to the southwest. The site is bounded on the northeast and southeast by undeveloped property. Access is provided by US Highway 61, also known as Airline Highway, which runs from the northwest to the southeast approximately 600 feet northeast of the site.

The APE also includes the area over which a new elevated piperack and new railspur would be constructed. The elevated piperack would originate within the 20-acre green diesel plant, extend over property owned by Valero where third-party underground pipelines and the Kansas City Southern Railway Company (KCSRC) railway are located, and tie into an existing elevated piperack within the VSCR. The estimated area coverage of the new piperack is approximately 0.2 acre. The new railspur would be constructed to connect the KCSRC railroad, which runs parallel to the southern boundary of the plant site, to the green diesel plant site. The spur would originate from a tie-in point to the southeast of the plant site and would extend diagonally to the northwest, traversing the same Valero-owned strip of property that houses the KCSRC right-of-way and third-party pipeline easements, entering the green diesel plant site at the southeastern corner. The new railspur would be approximately 1,000 ft. in length.

The APE also includes an offsite laydown yard of approximately 23 acres located approximately 2 miles northwest of the construction site along Airline Highway (Figures 1 and 4). Diamond would utilize this

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area during the construction phase for parking and construction laydown. The entire site has been elevated with gravel and it is currently in use by Valero for the same type of activities (parking and storage of construction materials). No excavation will take place in this area and it would be temporarily used during project construction.

2) A description of the steps taken to identify historic properties, including, as appropriate, efforts to seek information pursuant to Part 800.4(b);

A review of records for St. Charles Parish was performed using the online mapping and search tools provided by the Louisiana Office of Cultural Development. Six properties within the parish are on the National Register of Historic Places. The closest site is the Kenner and Kugler Cemeteries Archaeological District, over 2 miles from the project location. There are no known cultural, archaeological, or historic resources associated with the APE. Both the 20-acre plant site and 23-acre site for use during construction are currently in industrial use and have been cleared and graded (Figures 3 and 4). The 20-acre site was previously cleared, filled, and graded under U.S. Army Corps of Engineers Permit #MVN 2005-775 EE for use as a parking and laydown area. Prior to issuance of the permit, the Army Corps of Engineers was required to conduct a Section 106 review of the plant site. The APE has not been archaeologically or historically surveyed; however, it is unlikely that intact archaeological resources are present considering the prior ground disturbance of both sites that constitute the APE.

3) The basis for determining that no historic properties are present or affected.

Based on our review of the project and the information attached, DOE has determined that no historic properties would be affected by the proposed project as defined in NHPA regulations would occur (36 CFR 800.16(b)).

If, during construction activities, an unanticipated discovery of cultural materials or sites is made, all excavation would cease and your office would be contacted. Appropriate consultation requirements would be initiated and completed prior to any further disturbance of the discovery-site area.

DOE would appreciate a concurrence on our determination of no historic properties affected. You may fax this information to me at (202) 586-7809, send via email at sharon.r.thomas@hq.doe.gov, or mail to Sharon Thomas, U.S. Department of Energy, LP-10, 1000 Independence Ave. S.W., Washington, DC 20585. You may also contact me by phone at 202-586-5335 if you have any questions.

Sincerely,

Sharon R. Thomas
Environmental Protection Specialist

Enclosures