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TESORO
LOS ANGELES REFINERY

INTEGRATION AND COMPLIANCE PROJECT

FINAL
ENVIRONMENTAL IMPACT REPORT

VOLUME I: FEIR & Appendix A

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PREFACE

This document constitutes the Final Environmental Impact Report (EIR) for the Tesoro Los Angeles Refinery Integration and Compliance Project. The Draft EIR was circulated for a 94-day public review and comment period on March 8, 2016. The comment period ended on June 10, 2016. A total of 1,928 comment letters were received through February 3, 2017. The comment letters and responses are included in Appendix G of this document. The comments were evaluated and minor modifications have been made to the DEIR such that it is now a FEIR. None of the modifications alter any conclusions reached in the DEIR, nor provide new information of substantial importance relative to the draft document that would require recirculation of the Draft EIR pursuant to CEQA Guidelines §15088.5. Therefore, this document is now a FEIR. Additions to the text of the EIR are denoted using underline. Text that has been eliminated is shown using ~~strike outs~~. The edits made to the DEIR appear in the FEIR as shown in Table P-1.

Table P-1

List of Changes to the DEIR

Page No.	Section	Purpose for Change
1-11/1-12	1.7.7.1.3	Clarify description based on comments received
1-18	1.7.8	Adjust for delay in certification
1-19	1.7.9	Correct units; clarify truck activity
1-22	1.8.6	Grammatical and numerical corrections
1-25	1.9.1.1	Consistency with revised Appendix B-4
1-26	1.9.1.2	Consistency with modeling results
1-27	1.9.1.3	Consistency with modeling results
1-28	1.9.2.1.2	Clarification
1-37	1.10.1.1.3	Consistency with revised Appendix B-4
1-38	1.10.1.3.2	Consistency with revised Appendix B-3; clarify truck activity
1-43	1.10.6.1.2	Consistency
1-49	Table 1.9-1	Clarification
1-49	Table 1.9-1	Consistency with modeling results
1-50	Table 1.9-1	Clarification
2-17	2.5.4.1	Clarification
2-32/2-33	Figure 2-12	Clarification
2-38/2-39	2.7.1.3	Clarify description based on comments received
2-54	2.8	Adjust for delay in certification
2-57	2.8	Clarification
2-57	2.9	Correct units
2-61	2.10.3	Clarification
3-9	3.2.4.4	Clarification
3-10	3.2.4.5	Clarification
3-11	Table 3.2-5	Clarification

Table P-1 (continued)

Page No.	Section	Purpose for Change
3-14	Table 3.2-6	Correction
3-21	Table 3.3-1	Consistency with modeling worst-case scenario
4-3	4.1.2.1	Clarification
4-18	4.2.2.2	Clarification
4-22	4.2.2.2.1	Clarification
4-24	4.2.2.2.2	Clarification
4-29	Table 4.2-10	Clarification
4-31	Table 4.2-12	Consistency with revised Appendix B-3
4-31	Table 4.2-13	Consistency with revised Appendix B-4
4-35	4.2.2.6	Consistency with modeling results
4-36	4.2.3	Consistency with modeling results
4-37	A-5	Consistency of program title; clarification
4-37	A-7	Consistency of program title
4-37	Exceptions	Clarification
4-39	Table A	Clarification
4-40	3)	Clarification
4-41	Table 4.2-14	Clarification
4-48	Table 4.3-2	Clarification; consistency with modeling worst-case scenario
4-51/4-52	Figure 4.3-3	Clarification
4-59	4.3.2.5	Clarification
4-60	4.3.2.5.1	Clarification
4-61	4.3.2.5.1	Clarification
4-62	4.3.2.5.2	Clarification
4-62	4.3.2.6	Clarification
4-93	4.7.2.1	Clarification
4-96	4.7.2.1	Clarification
4-104	4.10.4	Clarification
5-5	Table 5.1-1	Update status
5-15	5.2	Clarification; update status
5-16	5.2.1.2.1	Adjust for delay in certification
5-17	Table 5.2-1	Update status
5-18	Table 5.2-2	Update status
5-19	5.2.1.3.2	Clarification
5-20	Table 5.2-3	Update status
5-20	5.2.1.4.2	Consistency with revised Appendix B-4
5-23	Table 5.2-4	Update status
5-24	5.2.2.3.2	Clarification
5-25	Table 5.2-7	Consistency with Appendices B-3 and B-5
5-26	Table 5.2-8	Consistency with Appendices B-3 and B-5
5-26	5.2.2.3.2	Consistency with Appendices B-3 and B-5

Table P-1 (concluded)

Page No.	Section	Purpose for Change
5-28	Table 5.2-9	Update status
5-29	5.2.3.2.2	Update status
5-33	Table 5.2-10	Update status
5-36	Table 5.2-11	Update status
5-37	5.2.5.3.1	Update status
5-39	Table 5.2-12	Update status
5-43	5.2.7.3.2	Clarification
6-8	6.3.5	Consistency with modeling results; clarification
6-12	6.4.1	Consistency with revised Appendix B-4
6-18	6.4.2	Consistency with revised Appendix B-4
6-25	6.4.3	Consistency with revised Appendix B-4
6-42	6.4.5	Consistency with revised Appendix B-4
7-3	References	Clarification
7-8/7-9	Organizations and Persons Consulted	Clarification
B-2	Revised Report	Clarifications
B-3	Revised Report	See Preface for revisions
B-4	Revised Report	See Preface for revisions
B-5	Revise Tables	Clarification
C	Revised Report	Add Preface for revisions
G	Add	Add appendix containing Comments on DEIR and Responses
H	Add	Add appendix containing Supplemental Health Risk Assessment

TESORO LOS ANGELES REFINERY

INTEGRATION AND COMPLIANCE PROJECT

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CHAPTER 1

INTRODUCTION AND EXECUTIVE SUMMARY

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1.0 INTRODUCTION AND EXECUTIVE SUMMARY

1.1 INTRODUCTION

The Tesoro Refining & Marketing Company LLC (Tesoro) is proposing the Los Angeles Refinery Integration and Compliance Project (proposed project). In June 2013, Tesoro purchased the adjacent BP West Coast Products LLC (BP) Carson Refinery which, as part of the proposed project, will be more fully integrated with the Tesoro Los Angeles Refinery – Wilmington Operations to form the Tesoro Los Angeles Refinery (Refinery). The Refinery includes: (1) the Wilmington Operations located at 2101 East Pacific Coast Highway in the Wilmington District of the City of Los Angeles; and (2) the Carson Operations, which is the former BP Carson Refinery located at 2350 East 223rd Street in the City of Carson.

In addition to further Refinery integration, the proposed project is designed to comply with the federally-mandated Tier 3 gasoline specifications and with State and local regulations mandating emission reductions. The Los Angeles Refinery Integration and Compliance Project is expected to substantially reduce greenhouse gas (GHG), sulfur oxides (SOx), nitrogen oxides (NOx), and carbon monoxide (CO) at the Refinery. This will be accomplished by reconfiguring the combined Refinery complex to enable shutting down the Fluid Catalytic Cracking Unit (FCCU) at the Wilmington Operations, and by reconfiguring the combined Refinery complex to improve the gasoline to distillate production ratio from the integrated Refinery in order to expeditiously respond and adjust to ongoing changes in market demand for various types of petroleum products. Additionally, heat recovery will be optimized by installing new heat exchangers and modifying specified units to further minimize criteria pollutant and GHG emissions. All new and modified stationary sources with emissions increases will be required to comply with Best Available Control Technology (BACT) requirements in South Coast Air Quality Management District (SCAQMD) Rule 1303.

1.2 PURPOSE/LEGAL REQUIREMENTS

The California Environmental Quality Act (CEQA) (Public Resources Code §21000 et seq., and California Code of Regulations, Title 14, Division 6, Chapter 3) requires that the environmental impacts of proposed projects be evaluated and that feasible methods to reduce, avoid or eliminate significant adverse impacts of these projects be identified and implemented. The lead agency is the public agency that has the principal responsibility for carrying out or approving a project that may have a significant effect upon the environment (Public Resources Code §21067). The proposed project requires discretionary approvals from the SCAQMD, City of Carson, and the Alameda Corridor Transportation Authority and, therefore, it is subject to the requirements of CEQA (Public Resources Code, §21080 (a)). If a proposed project is to be carried out by a nongovernmental person or entity, such as the proposed project, the lead agency will normally be the agency with general governmental powers, such as a city or county (CEQA Guidelines §15051(b)(1)). However, because the proposed project modifications will be located within both the cities of Carson and Los Angeles, each of these public agencies would only have discretionary approval authority for the components of the proposed project in their jurisdictions.

The SCAQMD has discretionary approval authority of the project components within both the City of Los Angeles and City of Carson. Because the SCAQMD is the public agency with the greatest responsibility for supervising or approving the project as a whole, it is the most appropriate public agency to act as lead agency (CEQA Guidelines §15051(b)). Therefore, as lead agency, the SCAQMD is responsible for preparing the Environmental Impact Report (EIR) for the proposed project.

In accordance with §15121(a) of the CEQA Guidelines, the purpose of an EIR is to serve as an informational document that: "will inform public agency decision-makers and the public generally of the significant environmental effect of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project."

To fulfill the purpose and intent of CEQA, as the lead agency for the proposed project, the SCAQMD prepared and released a Notice of Preparation and Initial Study (NOP/IS) for a 30-day public review and comment period beginning on September 10, 2014 through October 10, 2014. The NOP/IS was circulated to responsible agencies, neighboring jurisdictions, other public agencies, and interested individuals in order to solicit input on the scope of the environmental analysis to be included in the EIR.

The NOP/IS provided a preliminary analysis of environmental impacts that may be associated with the Tesoro Integration and Compliance Project (see Appendix A). Potentially significant adverse environmental impacts from the proposed project identified in the NOP/IS form the basis for and focus of the technical analyses in this EIR.

The NOP/IS concluded that the proposed project would not create significant adverse environmental impacts to the following areas: aesthetics, agricultural and forestry resources, biological resources, cultural resources, energy, geology and soils, land use and planning, mineral resources, population and housing, public services, and recreation.

A total of 93 comment letters were received on the NOP/IS during the public comment period, 85 of which expressed support for the proposed project. A copy of the comment letters received and responses to individual comments are provided in Appendix A. No comments were received on the NOP/IS that identified new potentially significant environmental topics or disputed any of the conclusions for each environmental topic.

1.3 SCOPE AND CONTENT

The following discussion summarizes the scope and content of this EIR. This chapter contains a summary of the proposed actions and its consequences (CEQA Guidelines §15123), Chapter 2 contains a complete and comprehensive project description (CEQA Guidelines §15124), and Chapter 3 contains the environmental setting which describes the physical environmental conditions in the vicinity of the project and normally constitutes the baseline physical conditions by which a lead agency determines whether an impact is significant (CEQA Guidelines §15125). The following environmental resources were identified in the NOP/IS as being potentially significant and are further analyzed (CEQA Guidelines §15126.2) in Chapter 4 of this document:

- Air Quality and Greenhouse Gas Emissions[1]
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Noise
- Solid and Hazardous Waste
- Transportation and Traffic

Mitigation measures have been identified in Chapter 4 for any adverse impacts that exceed applicable significance thresholds (CEQA Guidelines §15126.4). Pursuant to CEQA Guidelines §15130, a discussion of potential cumulative impacts has been prepared and is provided in Chapter 5. Alternatives to the proposed project in Chapter 6 of this Draft EIR were prepared in accordance with §15126.6 of the CEQA Guidelines. Chapter 6 describes a range of reasonable alternatives that could feasibly attain the basic objectives of the proposed project as a means of eliminating or reducing some of the significant adverse environmental effects associated with the proposed project.

1.4 RESPONSIBLE AND OTHER AGENCIES

CEQA Guidelines §15381 define a "responsible agency" as: "a public agency which proposes to carry out or approve a project, for which a Lead Agency is preparing or has prepared an EIR or Negative Declaration. For purposes of CEQA, responsible agencies include all public agencies other than the lead agency that have discretionary approval authority over the project." The SCAQMD is the lead agency for the proposed project. The City of Carson is a responsible agency and has discretionary authority for some aspects of the proposed project within its jurisdiction and has also been given an opportunity to review and comment of the NOP/IS and EIR for the proposed project. The Alameda Corridor Transportation Authority (ACTA), a joint powers authority of the cities of Los Angeles and Long Beach, is also a responsible agency over the proposed project as permits will be required from ACTA for the construction of pipelines along the Alameda Corridor and has also been given an opportunity to review and comment on the NOP/IS and EIR for the proposed project. While a portion of the proposed project is located in the Wilmington District of the City of Los Angeles, only ministerial permits with no discretionary approval are necessary for the proposed project from the City of Los Angeles.

No trustee agencies as defined by CEQA Guidelines §15386 have been identified with respect to the proposed project. However, notice of the proposed project has been sent to the Office of Planning and Research pursuant to Public Resources Code §21080.4 for distribution in the event trustee or other responsible agencies are identified for the proposed project. Agencies with

[1] Due to the complex physical, chemical, and atmospheric mechanisms involved in global climate change, the project's GHG emissions and the resulting significance of potential impacts are more properly assessed on a cumulative basis. Therefore, the environmental setting and the significance of potential impacts from the proposed project's GHG emissions is determined on a cumulative basis in Chapter 5 - Cumulative Impacts.

discretionary permitting responsibilities for the proposed project have been identified and are listed in Table 2.10-1.

1.5 INTENDED USES OF THE EIR

The Draft EIR is intended to be a decision-making tool that provides full disclosure of the environmental consequences associated with implementing the proposed project. Additionally, CEQA Guidelines §15124(d)(1) requires a public agency to identify the following specific types of intended uses:

- A list of the agencies that are expected to use the Draft EIR in their decision-making;
- A list of permits and other approvals required to implement the project; and,
- A list of related environmental review and consultation requirements required by federal, state, or local laws, regulations, or policies.

To the extent that local public agencies, such as the City of Carson, City of Los Angeles, and ACTA, are responsible for making land use and planning decisions related to the proposed project, it is expected that they will rely on this EIR during their decision-making process. See the preceding section for the public agencies, currently identified as responsible agencies, whose approval may be required and who may also be expected to use this EIR in their decision-making process. See also Table 2.10-1 in Chapter 2 for a list of discretionary permits and other approvals required to implement the proposed project.

1.6 AREAS OF CONTROVERSY

In accordance with CEQA Guidelines §15123(b)(2), the areas of controversy known to the lead agency, including issues raised by agencies and the public, shall be identified in the CEQA document. “Controversy” is defined as a difference in opinion or a dispute. Consistent with the purpose of the NOP/IS to solicit comments or other information, responses to individual issues raised in the comment letters that are related specifically to potential impacts from the proposed project were prepared. As necessary, some issues were further addressed in this EIR. Of the 93 comment letters, 85 were letters in support of the proposed project.

Eight letters were received that provided specific comments on the NOP/IS. Comment letters were received from the City of Carson, the California Department of Transportation (Caltrans), and the Native American Heritage Commission (NAHC). The City of Carson and attorneys representing the City of Carson, requested clarification of the lead agency and asked that certain information and analyses be included in the EIR. Caltrans provided guidance on addressing construction traffic impacts. The NAHC provided guidance for evaluation of historical resources. Finally, four letters were received regarding the storage and transportation of liquid petroleum gas (LPG) in the vicinity of the Tesoro Refinery and at third party storage facilities. The NOP/IS, the comment letters received on that document, and responses to individual comments can be found in Appendix A of this EIR.

The SCAQMD held a public scoping meeting on September 24, 2014 on the proposed project at the Carson Community Center at 801 E. Carson Street, Carson, California. An additional six comment letters expressing support for the proposed project, were received at the public scoping meeting. The issues that could be considered controversial are provided in Table 1.6-1. Table 1.6-1 contains only areas of controversy raised in the comments on the NOP/IS or at the scoping meeting. No other areas of controversy have been communicated to the SCAQMD prior to release of this EIR for public comment.

TABLE 1.6-1

Summary of Potentially Controversial Topics

Key Issues Raised	EIR Sections Where Addressed
Concerns regarding the storage and transport of LPG.	Section 4.3
Air quality and greenhouse gas analysis	Section 4.2 and Section 5.3

1.7 EXECUTIVE SUMMARY – CHAPTER 2: PROJECT DESCRIPTION

1.7.1 INTRODUCTION

Tesoro is proposing the Los Angeles Refinery Integration and Compliance Project (proposed project). The proposed project is designed to better integrate the Wilmington Operations and Carson Operations. In addition, the proposed project is designed to comply with the new federally-mandated Tier 3 gasoline specifications and with State and local regulations mandating emission reductions.

On April 23, 2014, the SCAQMD released a Notice of Intent to adopt a Draft Negative Declaration for the Tesoro Storage Tank Replacement and Modification project. The tank replacement modification project was considered to be a separate project from the Tesoro Refinery Integration and Compliance Project because it could go forward with or without the currently proposed project; that is, neither project relies on the other project to be implemented and both have independent utility. However, because of the timing of construction and implementation of the two projects, it was decided to incorporate the Tesoro Storage Tank Replacement and Modification project into the currently proposed project to provide a cohesive analysis of all environmental impacts from the two projects.

1.7.2 PROJECT OBJECTIVES

There are multiple objectives for this project that include modifications to further integrate Carson and Wilmington Operations so that consolidated operation can be optimized for improved operation, reduction of GHG emissions and criteria pollutants, improved energy recovery, and environmental compliance requirements. The project objectives include the following:

- Improving process efficiency through integration while maintaining the overall production capability of transportation fuels. Making process modifications that improve efficiency and enable shutdown of the Wilmington Operations FCCU prior to the next scheduled FCCU turnaround expected to occur in 2017, providing substantial emission reductions and reducing carbon intensity.

- Recovering and upgrading distillate range material from FCCU feeds. Tesoro proposes to achieve this objective by modifying 51 Vacuum Unit, the Mid-Barrel Distillate Treater and the Hydrocracker Unit at Carson Operations, and Hydrotreater Unit No. 4, and Hydrocracker Unit modifications at Wilmington Operations. Recovering distillate from FCCU feed enables shut down of the Wilmington Operations FCCU since the Carson Operations FCCU has sufficient capacity to process the FCCU feed that remains after distillate recovery.

- Complying with federal, state, and local regulations. Tesoro proposes to achieve this objective by: (1) meeting the U.S. EPA Tier 3 gasoline specifications; and (2) reducing Refinery NOx, SOx, and GHG emissions through proposed process modifications that improve efficiency, enable shutdown of the Wilmington Operations FCCU and lower carbon intensity.

- Improving financial viability for the newly integrated Tesoro Los Angeles Refinery and the local community. Tesoro proposes to achieve this objective by: (1) reducing future operating, capital, turnaround, and environmental compliance costs, primarily by shutting down the Wilmington Operations FCCU; (2) improving electrical supply reliability; (3) improving integrated Refinery transportation fuel production flexibility between gasoline and distillate products to respond to changes in market demand, including the capability to produce 100 percent of the Refinery gasoline production as CARB compliant gasoline; and (4) providing sustainable local jobs and tax revenue for the community.

- Integrating Carson and Wilmington Operations. Tesoro proposes to achieve this objective by installing the Interconnecting Pipelines to allow efficient transfer of hydrocarbons between the facilities to allow gasoline blending optimization, process unit feedstock optimization, and increased diesel production.

- Increasing overall Refinery processing efficiency. Tesoro proposes to achieve this objective by: (1) adding a Sulfuric Acid Regeneration Plant at the Wilmington Operations to regenerate sulfuric acid on-site; (2) adding a Wet Jet Treater to improve jet fuel quality; (3) upgrading and adding facilities to recover and treat propane for commercial sales, and (4) upgrading existing LPG rail facilities to enable fast unloading of railcars.

- Improving efficiency of water-borne crude oil receipt and marine vessel unloading. Unloading crude oil from marine vessels without delay will reduce vessel emissions at the

Port of Long Beach. Tesoro proposes to achieve this objective by constructing six new 500,000 barrel tanks at the Carson Crude Terminal and replacing two existing 80,000 barrel crude oil tanks at the Wilmington Operations with two 300,000 barrel tanks. Piping within the Carson Crude Terminal will be installed to connect the six new 500,000 barrel tanks to existing pipelines to the Carson Operations and Marine Terminal 1. The two new 300,000 barrel tanks will be connected to existing pipelines from the Wilmington Long Beach Terminal. Within the confines of the Wilmington Operations, the existing 12-inch diameter piping will be replaced with 24-inch diameter piping to connect the replacement tanks to the Wilmington Operations.

1.7.3 PROJECT LOCATION

The proposed project will occur at both the Wilmington and Carson Operations of the Tesoro Los Angeles Refinery. The Wilmington Operations are located within Wilmington, a community under the jurisdiction of the City of Los Angeles, at 2101 East Pacific Coast Highway, Wilmington, Los Angeles County, California 90744. The Carson Operations are located at 2350 East 223rd Street, Carson, California, 90810. Additionally, the Sulfur Recovery Plant (SRP) (considered to be a portion of the Wilmington Operations) is located at 23208 South Alameda Street in the City of Carson. The proposed project would include installing pipelines within the Refinery as well as under the Alameda Street and Sepulveda Boulevard adjacent to the Refinery to connect pipelines between the Wilmington and Carson Operations.

1.7.4 LAND USE AND ZONING

Implementation of the proposed project at the Wilmington and Carson Operations of the Tesoro Los Angeles Refinery will occur within an industrial area. Land uses in the vicinity of the Refinery include oil production facilities, refineries, hydrogen plants, coke handling facilities, container terminals, transportation corridors, storage tank farms, automobile wrecking/dismantling facilities, and other industrial operations. The Wilmington Operations are bounded to the north by Sepulveda Boulevard, to the west by Alameda Street; to the south by railroad tracks and to the east by the Dominguez Channel. The Wilmington Operations are zoned heavy industrial (M3-1). The Carson Operations and all adjacent properties are zoned manufacturing heavy (MH). The closest residential area is approximately 100 feet from the property line across Wilmington Avenue to the southwest of the Refinery (adjacent to the Carson Crude Terminal). The closest residential area to the proposed project locations within the Refinery is about 1,300 feet.

1.7.5 OVERVIEW OF PETROLEUM REFINING

Crude oil is a mixture of hydrocarbon compounds and relatively small amounts of other materials, such as oxygen, nitrogen, sulfur, salt, sediment, and water. Petroleum refining is a coordinated arrangement of manufacturing processes designed to produce physical and chemical changes in the crude oil to remove most of the non-hydrocarbon substances, break the crude oil into its various components, and blend them into various useful products. The overall refining process uses four kinds of techniques: 1) separation, including distilling hydrocarbon liquids into gases, gasoline, diesel fuel, fuel oil, gas oils, and heavier residual materials; 2) cracking or breaking large hydrocarbon molecules into smaller ones by thermal or catalytic processes; 3) reforming using heat and catalysts to rearrange the chemical structure of a particular oil stream to improve its quality; and, 4) chemically combining two or more hydrocarbons to produce high-grade gasoline. Specific topics discussed in detail include types of crude oil, the refining process, and refinery optimization (see Section 2.5.1 through 2.5.3).

1.7.6 TESORO REFINERY EXISTING OPERATIONS

Currently, the Wilmington and Carson Operations function as two separate and distinct facilities with some limited integration.

1.7.6.1 Wilmington Operations

Crude oil for the Wilmington Operations is delivered via ship using the pipeline from the Tesoro Marine Terminal at the Port of Long Beach. Crude oil can also be delivered via pipeline from other onshore locations. No crude oil is transported to the Wilmington Operations via rail and there are no facilities to receive crude oil deliveries by railcar. The Wilmington Operations currently utilize 20 storage tanks to store crude oil and other heavy petroleum liquids. Crude oil is processed in the Crude Unit where it is heated and distilled into various hydrocarbon components, which are further processed in downstream Wilmington Operations units. The Wilmington Operations also receive, process, and transport other petroleum products (crude oil not included) to and from the Wilmington Operations by ship, truck, and railcar. These petroleum products include residuum, gas oil, diesel, gasoline, naphtha, transmix, and LPG.

1.7.6.2 Carson Operations

Crude oil for Carson Operations is unloaded from tankers at terminals located in the Port of Long Beach and then transferred via pipeline and stored at Port of Long Beach Terminals or the Carson Crude Terminal. No crude oil is transported to the Carson Operations via rail and there are no facilities to receive crude oil deliveries by railcar. Crude oil is sent via pipeline from the marine terminals to Carson Operations for further storage in any of nine Refinery crude oil storage tanks and then processed in the Crude Units. Crude oil can also be delivered via pipeline from other onshore locations. The Carson Operations also receive, process, and transport other petroleum products (crude oil not included) to and from the Carson Operations by ship, truck, and railcar. These petroleum products include residuum, gas oil, diesel, gasoline, naphtha, and LPG. Additionally, the Carson Operations has the Watson Cogeneration Facility that currently produces excess power, beyond the Carson Operations' needs, and sells the excess power to Southern California Edison.

1.7.6.3 Tesoro Los Angeles Refinery

The Tesoro Los Angeles Refinery consists of two adjacent facilities, Carson Operations and Wilmington Operations, which are managed as one Refinery. The Carson and Wilmington Operations have in the past and continue to produce a variety of products including unleaded gasoline, jet fuel, diesel fuel, fuel oil, petroleum gases, petroleum coke and sulfur. The Carson

Operations also produces high purity propylene as feedstock to the adjacent Ineos Polypropylene Plant, and calcined coke. Elemental sulfur and petroleum coke are produced as by-products of the refining process. Major processing units at both the Carson and Wilmington Operations include the Crude Units, the Vacuum Units, the Delayed Coker Units, hydrotreating units, reforming units, the FCCUs, the Alkylation Unit, hydrogen plants, the Sulfur Recovery Plants, and the Cogeneration Plants. The major differences between the Carson and Wilmington Operations is that the Carson Operations is a larger operation with three crude, two vacuum, and two coker units whereas the Wilmington Operations only has one crude, one vacuum, and one coker unit.

1.7.6.4 Current Los Angeles Refinery Integration

Currently Carson and Wilmington Operations are connected via Tesoro and third party pipelines that enable the transfer of intermediate and finished products between the two facilities. The Refinery optimizes crude oil and other refinery feedstock processing to produce the mixture of refined products that are marketed from the Tesoro Los Angeles Refinery. Unit turnarounds are aligned between the Carson and Wilmington Operations to minimize economic and local area impacts from shutdowns. Hydrogen use is balanced and managed across the Los Angeles Refinery for hydrotreating purposes and output of clean fuel products. Crude oil, intermediate feedstocks and products are transferred between Carson and Wilmington Operations via pipeline, as required, to optimize Refinery production to meet market demand.

1.7.6.5 Marine Terminals Associated with Los Angeles Refinery

The Refinery receives crude oil from ships which unload at three marine terminals operated by Tesoro Logistics Operations, LLC (Tesoro Logistics) in the Port of Long Beach (POLB). The unloaded crude oil is then piped to the Refinery for processing. The proposed project is not expected to result in any physical changes to the existing marine terminals. Additionally, no changes to the pipelines connecting the marine terminal to the Refinery are planned as a result of the proposed project.

1.7.7 PROPOSED PROJECT

The crude oil and feedstock processing capability at the integrated Refinery has the potential to increase by approximately two percent or 6,000 bbls/day as a result of the proposed project due to a revision of the described duty of the Wilmington Operations Coker fresh feed heater in the existing permit to conform with SCAQMD and industry standards. This permit revision has the potential to enable an increase of 6,000 bbls/day in crude oil processing capacity. To increase crude throughput capacity beyond the 6,000 bbls/day, the Refinery would need to physically modify equipment such as the Crude Units or Delayed Coker Units. No physical modifications to the Crude Units or Delayed Coker Units are included as part of the proposed project; therefore, crude throughput capacity is constrained, so no other increase in crude capacity will occur.

Modifications will be made to recover diesel and jet fuel boiling point range material, also known as distillate, from gas oil that is currently fed to the FCCUs at both Wilmington and Carson Operations. This will enable the remaining gas oil feed from the Wilmington Operations FCCU to be diverted via the proposed interconnecting piping to the Carson Operations FCCU, while maintaining the same overall level of transportation fuels production. In addition, facilities will be added to remove impurities such as sulfur, nitrogen compounds, and organic acids from distillates in order to make on-specification products. The modifications will be designed so that the combined Refinery operates within the existing capacity of the SRPs. Following project completion, when the diesel and jet range material are recovered and the remaining gas oil feed is diverted to the Carson Operations FCCU, the FCCU at Wilmington Operations will be shut down and the Refinery will be integrated as one operating Refinery.

1.7.7.1 Wilmington Operations

Process modifications to improve efficiency and achieve integration will enable shutting down the Wilmington Operations FCCU which is expected to substantially reduce emissions at the integrated Refinery. Reconfiguring the combined Refinery complex is expected to improve the gasoline to distillate production ratio and is anticipated to result in minor increases in air pollutant emissions. However, the net effect on overall emissions from the proposed project is expected to be emissions reductions at the Refinery, primarily associated with process modifications to improve efficiency and integration, enabling the shutdown of the Wilmington Operations FCCU, as well as shutdown or reduced operations of other equipment at the Refinery. Additionally, equipment production efficiency and heat recovery will be optimized for new and modified units to further reduce overall emissions and optimize energy utilization.

1.7.7.1.1 Wilmington Operations FCCU Shutdown

An FCCU cracks or converts heavy hydrocarbons into lighter, gasoline and distillate range hydrocarbons in the presence of fine particles of catalyst that are circulated throughout the process. The Refinery will modify other units to ensure there will be no loss in overall production due to the FCCU shutdown, prior to taking the FCCU offline. Midway through the proposed project, the Wilmington Operations FCCU will be shut down, the equipment will be permanently removed from service in compliance with SCAQMD-requirements, abandoned in place, and Tesoro will relinquish all relevant permits.

1.7.7.1.2 Hydrocracker Unit (HCU) Modifications

The Wilmington Operations HCU capacity is being increased to accommodate conversion of the distillate material previously routed to the Wilmington Operations FCCU. It will be recovered as HCU feed in order to reduce the amount of gas oil feed produced and to enable the shutdown of the Wilmington Operations FCCU. The reactor and fractionation sections will be modified to increase the production of ultra-low sulfur diesel and gasoline. The Wilmington Operations HCU modification will include adding new nozzles to two existing vessels, modifying the hydrogen recycle compressor internals to accommodate higher unit capacity, installing a small hydrogen booster compressor, installing or modifying as many as three heat exchangers to provide improved heat integration, installing two new electrically driven pumps, and associated piping and instrumentation. The proposed project currently includes increasing the permitted firing duty of two existing heaters in the Wilmington Operations HCU, with a common stack and SCR, by a total of 25 mmBtu/hr. While the Wilmington Operations HCU capacity would be increased approximately 15 percent, this modification will have no impact on the overall integrated Refinery crude throughput capacity.

To recover propane for the proposed new Propane Sales Treating Unit (PSTU) described below, the Wilmington Operations HCU fractionation section will also be modified by installing two new water cooled exchangers, one knockout drum, and associated piping and instrumentation. An existing reflux pump and two heat exchangers in the fractionation section will be removed.

1.7.7.1.3 Delayed Coker Unit (DCU) Fresh Feed Heater H-100

The Wilmington DCU fresh feed heater H-100 heats DCU charge, a mixture of crude oil, residual from the Crude Unit, slop oil (internally recycled oil and off-specification products) and FCCU main fractionator bottoms. H-100 provides heat to separate the DCU charge~~that are fed into the unit so they can be fractionated~~ into feedstock streams for other refinery process units. The heater has 36 burners. Each burner can operate up to a maximum heat release of 8.4 mmBtu/hr. Thus, the maximum heat release of the heater as a whole is 302.4 mmBtu/hr (36 x 8.4 = 302.4). The heater manufacturer, however, only guarantees that each burner will operate up to 7 mmBtu/hr. Thus, the guaranteed heat release of the heater as a whole is 252 mmBtu/hr (36 x 7 = 252). ~~The existing equipment description of the Fresh Feed Heater in the Title V permit will be revised to conform to SCAQMD/Industry standards. The description will be changed from the 'design heat release' basis (252 mmBtu/hr) to the industry standard 'maximum heat release' basis (302.4 mmBtu/hr). Revising the equipment description to maximum heat release will ensure that operating the heater at maximum heat released conforms with the SCAQMD's expectation that equipment is operated within the maximum heat release described in the permit.~~

The Refinery has at times operated Heater H-100 above the guaranteed heat release level of 252 mmBtu/hr when it needed~~Additional heat is needed at times~~ to either lift more gas oil out of the Coker feed in downstream distillation columns or simply to process more feed through the DCU, to the physical limits of the downstream units. For example, during a Coker shutdown, residuum and crude oil inventory that are normally processed in the unit accumulate. After a shutdown, it is necessary to process feedstocks at a higher rate in order to process the ~~inventory gains of~~ excess feedstock that accumulated during a shutdown.

The current Title V permit describes the H-100 heater based on the heater's guaranteed heat release of 252 mmBtu/hr. As part of the proposed project, this description will be revised to reflect the heater's actual maximum level of operation (302.4 mmBtu/hr) rather than the lower guaranteed level of operation (252 mmBtu/hr). Heater H-100 will not be physically modified in any way as part of the project. And, as described above, the heater has operated above 252 mmBtu/hr in the past. Nonetheless, the DEIR made the conservative assumption that the change in permit description would allow Tesoro to increase the maximum operation of heater H-100 from 252 mmBtu/hr to 302.4 mmBtu/hr. In order to ensure that this assumed increase in operations would not result in any increase in emissions, the SCAQMD imposed a new permit condition that limits daily emissions of criteria pollutants from the H-100 heater to levels that would be generated if the heater were never operated above 252 mmBtu/hr. This would be achieved through efficient maintenance and operation of air pollution control equipment. These limits apply to mass emissions of CO, NOx, SOx, particulate matter less than ten microns in diameter (PM10), and volatile organic compounds (VOC).

~~Alternatively, higher crude rates may be processed in the DCU heater as analyzed herein. No physical modifications are planned to be made to the heater. However, modifications may be required during the permit review process. The maximum heater firing capability will remain unchanged. The number of burners (36) and the maximum heat release (8.4 mmBtu/hr) of each burner in the heater will remain the same. Although the described duty of the heater will increase to 302.4 mmBtu/hr, there will be no increase in emissions as permit conditions will be imposed to limit criteria pollutant emissions. Mass emissions of CO, NOx, SOx, particulate matter less than ten microns in diameter (PM10), and volatile organic compounds (VOC) will be restricted in the revised permit.~~

The application to revise the permit description of H-100 heater was submitted in early 2014, independent of the proposed project. As a result, this component of the proposed project was not described in the NOP/IS. But upon further review, it was concluded that this description change had the potential to~~could~~ create adverse environmental impacts ~~that would likely occur simultaneously with the proposed project.~~because, for example, it could enable a slight ~~this revision to the heater equipment description has the potential to~~ increase ~~the~~in crude oil throughput to the Refinery ~~by a small amount~~ of up to two percent (or up to 6,000 bbl/day). While the Refinery could opt to process either a small increase in crude oil throughput or slightly heavier crude oil blend, the processing of additional crude oil ~~blend~~ would result in greater environmental impacts downstream of the DCU, as described in Section 4.1.2.1. Therefore, for purposes of analyzing the worst-case impacts, this document assesses an increase in crude oil throughput capacity. The increased heat release from the H-100 heater and/or increased crude oil throughput is anticipated to occur once the modified permit is issued. Including the permit revision as part of the proposed project ensures that all possible impacts from the modification of the Refinery are fully analyzed.

1.7.7.1.4 Catalytic Reformer Unit (CRU)-3 Modifications

The CRU-3 fractionation section will be modified to enable recovery of Hydrocracker propane from the refinery fuel gas system. The modifications to CRU-3 will include installing one new depropanizer tower that is larger than the existing tower, as many as three heat exchangers, as many as four electrically driven pumps, and associated piping and instrumentation.

1.7.7.1.5 Propane Sales Treating Unit (PSTU)

A new PSTU will be constructed at the Wilmington Operations to enable the process efficiency improvement to treat propane for sale. A PSTU conditions liquid propane for sale using absorbers and dryers to meet sales specifications. The PSTU will treat approximately 2,000 bbl/day of propane and will include eight vessels and four pumps that will be installed to purify recovered propane from the Wilmington Operations HCU and CRU-3.

1.7.7.1.6 Hydrotreater Units 1 and 2 (HTU-1 and 2) Modifications

The HTU-1 will be modified to hydrotreat approximately 7,000 bbl/day of FCCU gasoline to comply with the new federally-mandated Tier 3 gasoline specifications and to hydrotreat jet range components. The modifications to HTU-1 will include modifying or installing as many as five heat exchangers, and adding a pump and associated piping and instrumentation. Because the HTU-2 will continue to produce the same types of feedstock that it currently produces, its feedstock will be separated from HTU-1's feedstock. The HTU-2 feedstock separation modifications will include repurposing an existing diesel salt dryer to be used as a feed surge drum, installing as many as two electrically driven pumps, and associated piping and instrumentation.

The proposed modifications to HTU-1 will also allow it to start hydrotreating jet fuel, treating approximately 12,000 bbl/day to remove sulfur impurities. The modifications will include installing one new stripping steam nozzle on the stabilizer, one coalescer, one salt dryer, and condensate pot, and associated piping and instrumentation.

1.7.7.1.7 Hydrotreater (HTU-4) Modifications

HTU-4 will be modified as part of the proposed project to increase distillate yield and must be completed in order to allow for the shutdown of the Wilmington Operations FCCU, and to fully utilize the existing hydrotreating capacity to produce ultra-low sulfur diesel. There will also be modifications to recover jet fuel, and added heat integration equipment to reduce energy consumption by producing steam in heat exchangers, providing process heat to two strippers and preheating boiler feed water. HTU-4 will process either gas oil or high sulfur diesel. The proposed modification to the HTU-4 will allow the Refinery to minimize motor fuels production disruptions during both planned and unplanned outages. Other modifications to HTU-4 include adding new nozzles on the fractionator, modifying the product coolers, installing a new surge drum, a salt dryer, a coalescer, a condensate pot, as many as four new electrically driven pumps and eleven heat exchangers, and associated piping and instrumentation.

1.7.7.1.8 New Sulfuric Acid Regeneration Plant (SARP)

The proposed new Sulfuric Acid Regeneration Plant (SARP) will be constructed at the Wilmington Operations and will remove impurities from and recycle the Wilmington and Carson Operations spent sulfuric acid to produce fresh sulfuric acid on-site rather than sending it off-site for treatment. The SARP is sized for an approximate throughput of 400 tons/day of sulfuric acid production and regeneration and will include three tanks, as many as eight electrically driven pumps, a natural gas fired 42 mmBtu/hr Decomposition furnace, a five mmBtu/hr Converter heater, a natural gas fired 20 mmBtu/hr Process Air Heater, a waste heat steam generator, as many as four blowers, as many as eight heat exchangers, four towers, one reactor, one stripper, three scrubbers, one electrically driven compressor, three drums, and associated piping and instrumentation. The fresh sulfuric acid will be sent back to the Alkylation Units for reuse. Spent sulfuric acid is currently transported off-site for recycling at a third-party vendor.

1.7.7.1.9 Wilmington Replacement Crude Oil Tanks and Other Tank Modifications

To improve the efficiency of water-borne crude oil receipt and marine vessel unloading, two new 300,000 bbl internal floating roof storage tanks (Tanks 300035 and 300036) will replace two existing 80,000 bbl fixed-roof storage tanks (Tanks 80035 and 80036) in the north tank area of Wilmington Operations. The new larger tanks will allow marine vessels to unload without undue delay, thereby reducing the time vessels are required to wait at anchorage until sufficient tankage is available for vessel discharge. The new tanks will be permitted to store the same types of products as the existing tanks. Storage capacity does not affect Refinery throughput, which is based on processing capabilities as described in Section 2.5.4.1.

The scope of this part of the proposed project will include demolishing two existing storage tanks, installing two new larger tanks in the same location as the tanks being removed, replacing 5,000 feet of 12-inch diameter piping with 24-inch diameter piping within the Wilmington Operations to allow the tank loading rate to increase from 5,000 bbl/hr to 15,000 bbl/hr. The scope includes modifying one existing tank (Tank 80038) by connecting it to a vapor recovery system. Existing Tanks 80038, 80060, 80067, and 80079 will require change of service permit modifications and annual throughput increases for each tank.

1.7.7.2 Carson Operations

The proposed Tesoro Los Angeles Refinery Integration and Compliance Project includes modifications at the Carson Operations, resulting in a combined Refinery complex and improving the gasoline to distillate production ratio. Additionally, equipment energy efficiency and heat recovery will be optimized for new or modified units, resulting in lower overall emissions.

In the NOP/IS the project description for the Carson Operations included modifications to the No. 1 and No. 2 Cokers to comply with SCAQMD Rule 1114 – Petroleum Refinery Coking Operations, which requires recovery of additional vent gases during coke drum deheading operations. Rule 1114 requires that the ejector system be installed at the next scheduled turnaround for each Coker unit. Compliance is required beginning in January 2016 for No. 2 Coker. The impacts of the Rule 1114 compliance projects were analyzed separately in the Environmental Assessment for Rule 1114 adoption (SCAQMD, 2013). As a result, because the Rule 1114 component has already been analyzed for potential environmental impacts and does not rely on any components of the proposed project, it has been removed from the proposed project. To the extent that the Rule 1114 component of the proposed project contributes to cumulative impacts, they will be evaluated in Chapter 5 of this EIR.

1.7.7.2.1 No. 51 Vacuum Unit Modifications

The No. 51 Vacuum Unit will be modified to allow increased distillate yield, or diesel production, which will require reducing vacuum gas oil production as much as 8,000 bbl/day. The No. 51 Vacuum Unit modifications will include modifying the feed heater’s Title V permit described duty from 300 to 360 mmBtu/hr, installing one new sixteen-inch nozzle on the vacuum tower, as many as five new exchangers, two strainers, as many as three new electrically driven pumps, and associated piping and instrumentation. No substantial heater modifications are required to achieve a firing rate of 360 mmBtu/hr; however, burner tips may be replaced with a different design. The heater duty increase will enable increased recovery of distillate out of gas oil in the vacuum column.

1.7.7.2.2 Carson Operations FCCU Modifications

The NOP/IS presented two types of modifications to the Carson Operations FCCU, physical and operational. The physical modifications (i.e., installing a feed surge drum, as many as two pumps and two heat exchangers, and associated piping and instrumentation) have been canceled and removed from the proposed project. However, the proposed process modifications to improve efficiency and achieve integration will still be included. This will enable shutdown of the Wilmington Operations FCCU, and allow the Carson Operations FCCU to accept a portion of the Wilmington Operations gas oil feed. The throughput capability of the Carson Operations FCCU will remain unchanged. New pipelines will be routed between the Wilmington Operations and the Carson Operations FCCU feed tanks. Although physical modifications to the Carson Operations FCCU are no longer proposed, the impacts from the potential increase in utilization of the Carson Operations FCCU have been addressed in Chapter 4.

1.7.7.2.3 New Wet Jet Treater

One new 50,000 bbl/day Wet Jet Treater will be installed at Carson Operations to treat jet fuel by removing mercaptans and reducing the total acid number (TAN), or organic acid content, in the jet fuel produced in upstream units. The Wet Jet Treater will increase Refinery operating efficiency. The Wet Jet Treater includes one mercaptan removal reactor, one TAN removal reactor, two product separators, one spent caustic loading facility, as many as six associated electrically driven pumps, two salt dryers, two clay filters, and associated piping and instrumentation. Feed and fresh caustic will be routed to the new Wet Jet Treater and spent caustic and treated jet fuel will be routed to existing storage tanks. The spent caustic flow rate is conservatively estimated at approximately 11 gallons per minute (gpm). Approximately four additional railcar loads per week of spent caustic will be generated and shipped to the Gulf Coast for recycling.

1.7.7.2.4 Hydrocracker Unit (HCU) Modifications

The Carson Operations HCU capacity will be increased by approximately 10 percent. The Carson Operations HCU will be modified as part of the proposed project to increase distillate yield to allow for the shutdown the Wilmington Operations FCCU by enabling it to process the distillate recovered from the No. 51 Vacuum Unit. Processing the recovered distillate feed will require increased hydrogen gas usage to allow the modified HCU to comply with existing low sulfur diesel product specifications. The increased hydrogen gas capacity will be provided by increasing the recycle gas compressor speed. In addition, the Carson Operations HCU energy utilization efficiency will be improved by installing a steam generator. The HCU modification will include installing one new steam generator heat exchanger, an air cooler, and associated piping and instrumentation.

1.7.7.2.5 Light Hydrotreating Unit (LHU) Modifications

The LHU will be modified to more effectively remove sulfur from FCCU gasoline to comply with the new federally-mandated Tier 3 gasoline sulfur specifications. The LHU will process a higher sulfur feed material derived from existing fractionation equipment. The proposed modifications will include installing one new stripping steam nozzle on the stabilizer, as many as five new heat exchangers, one coalescer, a condensate pot, and associated piping and instrumentation.

1.7.7.2.6 Naphtha Hydrodesulfurization (NHDS) Unit Modifications

The existing Carson Operations Naphtha Hydrodesulfurization (NHDS) Unit will be modified with the installation of new equipment to allow removal of contaminants from unit feed and sulfur from pentanes. This enables flexibility for additional gasoline production to partially compensate for lost production from the Wilmington Operations FCCU. The existing Reactor Feed Heater will be retrofitted with new ultra-low NOx burners to reduce emissions. The modifications will include repurposing and modifying the existing Isooctene debutanizer tower to separate isopentane from the Carson Operations NHDS feed. The modifications include the addition of eight new nozzles on the debutanizer tower, installation of a caustic scrubber, two knockout drums, a product coalescer, an air cooler, an accumulator, a condensate pot, as many as 14 new heat exchangers, six electrically driven pumps, and associated piping and instrumentation.

1.7.7.2.7 Naphtha Isomerization Unit Modifications

The existing Carson Operations Naphtha Isomerization Unit will be modified to recover propane and heavier material from the Unit off-gas, enabling additional product sales. The Naphtha Isomerization Unit modifications include addition of an off gas caustic scrubber, two reactor effluent flash drums, up to two heat exchangers, four pumps, and associated piping and instrumentation.

1.7.7.2.8 Alkylation Modifications

Amylenes (C5 olefins) will be recovered from FCCU gasoline in an existing fractionation tower and converted to low vapor pressure gasoline in the modified Alkylation Unit. Alkylation Unit capacity will remain unchanged. The modifications to process amylenes will include repurposing the Depentanizer column, replacing one existing four inch nozzle with an eight-inch nozzle on the olefin feed surge drum, installing as many as six heat exchangers, one filter/coalescer, one truck loading rack, two electrically driven pumps, and associated piping and instrumentation. The modifications to process propylene and butylene will include the installation of a propylene chiller and associated piping and instrumentation.

1.7.7.2.9 Mid-Barrel Distillate Treater

The existing Mid-Barrel Distillate Treater incorporates a hydrotreater to remove sulfur from straight run diesel and converts it to ultra-low sulfur diesel. To ensure compliance with U.S.

EPA mandated Tier 3 gasoline specifications, the Mid-Barrel Distillate Treater will be modified to enable it to desulfurize heavy FCCU naphtha. Interconnecting Pipelines to/from the LHU and Mid Barrel Distillate Treater will be installed. New bypass piping to recycle a portion of the product stream back to the feed system will also be installed.

1.7.7.2.10 Steam System Balance Modifications

The Carson Operations steam system demand will increase due to compliance with new federally-mandated Tier 3 gasoline specifications and amylene alkylation. The increased steam demand will be met by a combination of: installing waste heat steam generators (heat exchangers), generating more steam from the existing Watson Cogeneration Facility, and reducing steam demand from existing steam turbines.

1.7.7.2.11 New Crude Tankage

To improve the efficiency of water-borne crude oil receipt and marine vessel unloading, up to six new 500,000 barrel floating roof crude oil storage tanks will be constructed adjacent to the Carson Crude Terminal. The new tanks will allow marine vessels to unload crude oil without undue delay, thereby reducing the time vessels are required to wait at anchorage until sufficient tankage is available for vessel discharge. This portion of the project will reduce the amount of time that vessels spend within the port and increase the amount of crude oil that can be unloaded and stored. Decreasing the amount of time the vessels spend within the port and at anchor will substantially reduce annual ship emissions. Storage capacity does not affect Refinery throughput, which is based on processing capabilities as described in Section 2.5.4.1.

1.7.7.3 Modifications to Supporting Equipment

1.7.7.3.1 Interconnecting Pipelines

To more fully integrate the Refinery, this element of the proposed project includes pipelines to transport materials to and from various refinery units, e.g., new units, and storage facilities, as well as pipelines to transport materials between the Carson Operations and Wilmington Operations. Up to 15 new pipelines are expected to transport gasoline and gasoline blending components, crude oil, gas oil, butylene, propylene, and liquid petroleum gases.

The proposed project would include installing a bundle of pipes under the Alameda Corridor and Sepulveda Boulevard as part of the work that will connect pipelines between the Wilmington and Carson Operations. The pipe "bundle" is where the pipelines come together in one place and go underground to cross adjacent streets. The pipe bundle will require a 54-inch bore using horizontal directional drilling (HDD). HDD would be used to bore underneath (approximately 80 feet in depth) South Alameda Street and East Sepulveda Boulevard.

With the exception of pipelines that will be routed underground near the Carson and Wilmington Operations Coke Barns, pipelines located outside of the HDD bore, would then be routed above ground on pipe racks or ground level pipeline supports into the respective product and supply manifolds within the Refinery property.

1.7.7.3.2 Electrical Connection to Wilmington

To more fully integrate the Refinery, up to six new 69 kV electrical cables and two new 13.8 kV cables will be routed via conduit systems and overhead transmission lines from the Carson Watson Cogeneration Facility located at the Carson Operations to the Sulfur Recovery Plant (see Figure 2-17) and Wilmington Operations. One new 69 kV substation, and at least two new transformers with associated cabling, are proposed to be installed at the Watson Cogeneration Facility. One 69 kV substation with two new 13.8 kV main substations with at least four transformers and associated switch gear and wiring will be installed at the Wilmington Operations. This portion of the proposed project will allow electricity generated at Carson Operations to be used at the Wilmington Operations.

1.7.7.3.3 LPG Rail Unloading

LPG Rail Car Unloading facilities will be modified at Carson Operations to allow increased deliveries of approximately 4,000 bbl/day of Alkylation Unit feedstocks (LPG including propane, propylene, etc.). LPG Rail Unloading facilities will be used to transfer LPG to the Refinery to replace a portion of the Alkylation Unit feed lost by the closure of the Wilmington Operations FCCU. LPG handling at the Refinery may increase by up to ten railcars per day. Increased production of alkylate is critical for blending clean-burning gasoline due to its properties, such as low benzene and sulfur content and high octane content. The scope of work will include installing a vaporizer, a surge drum, a knockout pot, as many as four electrically driven transfer pumps, and associated piping and instrumentation. Currently, Carson Operations unloads up to 11,000 bbls/day of LPG into on-site pressurized tankage for use in the refining process. The LPG rail loading modifications will allow the Refinery to import up to about 15,000 bbl/ day of LPG, resulting in the increase of about 4,000 bbl/day or 10 railcars per day at the Refinery.

1.7.8 CONSTRUCTION OF THE PROPOSED PROJECT

Construction activities for the proposed project were~~are~~ expected to begin in the first half of 2016 and were~~are~~ expected to be completed by March 2021. The construction schedule is expected to commence following certification of the FEIR and issuance of permits. The dates used here and shown in Figure 2-18 will adjust accordingly. The construction activities for most of the components are expected to overlap from about the third quarter of 2016 to second quarter 2017. Most construction activities are expected to be completed by the end of 2018. Construction activities associated with the crude oil storage tanks are not expected to be completed until March 2021. Construction work shifts are expected to last about ten hours per day during most portions of the construction schedule. During normal construction periods, one work shift per day is expected beginning at 7:00 a.m. and ending at 5:30 p.m. During Refinery turnaround periods, two work shifts are expected and work may be conducted 24 hours per day. Shifts would operate from 6:00 a.m. to 6:00 p.m. and 6:00 p.m. to 6:00 a.m.

1.7.9 OPERATION OF THE PROPOSED PROJECT

Construction of the project will not affect where the Refinery obtains crude oil. The project is not designed to enable the Refinery to change its feedstock or crude oil blend. The Refinery will continue its practice of seeking cost-effective crude oils that can be blended with other crude oils and feedstocks to create the necessary blends suitable for Refinery operations (see Section 2.5.4.1 for additional detail).

Once construction of the proposed project is completed, the existing work force at the Refinery is not expected to increase or substantially change the volume of traffic. No increase in permanent workers is expected so no increase in worker traffic is expected. Construction of the Sulfuric Acid Regeneration Plant will decrease traffic in the area because spent sulfuric acid is currently transported off-site for recycling. While truck transport will continue, installing the Sulfuric Acid Regeneration Plant will eliminate approximately 6,000 acid transport truck trip miles per ~~month~~ year that are currently used to transport spent and regenerated sulfuric acid to and from Wilmington Operations due to the reduced distance traveled. Additionally, there will be no daily increase over baseline peak day activity of coke transport trucks to the Port of Long Beach. However, annual coke production may increase as result of the potential increase of up to 6,000 bbl/day in crude oil processed at the Wilmington Operations DCU. Therefore, the annual coke truck trips to the Port are expected to increase by 1,460.

1.7.10 PERMITS AND APPROVALS

The proposed project will require approvals from a variety of federal, state, and local agencies as detailed in Section 2.10.

1.8 EXECUTIVE SUMMARY – CHAPTER 3: EXISTING ENVIRONMENTAL SETTING

1.8.1 INTRODUCTION

This chapter describes the existing environment in the vicinity of the Refinery that could be adversely affected by the proposed project. This EIR is focused only on the environmental topics identified in the NOP/IS (see Appendix A) that could be significantly adversely affected by the proposed project. The environmental topics identified in Chapter 3 include both a regional and local setting.

1.8.2 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

Chapter 3 discusses the effects of meteorological conditions, temperature and rainfall, and wind flow patterns on the existing air quality conditions in the South Coast Air Basin (Basin). Existing air quality is examined for criteria pollutants, regional air quality, local air quality, the Refinery's criteria pollutant emissions, toxic air contaminants (TACs), as well as the regulatory setting.

The Tesoro Los Angeles Refinery is located within the SCAQMD's jurisdiction. Over the last two decades, air quality has substantially improved within the district. Nevertheless, several air quality standards continue to be regularly exceeded. Of the National Ambient Air Quality Standards (NAAQS) established for criteria pollutants, the Basin is designated as non-attainment for PM2.5, and ozone for both state and federal standards. The Basin, including the proposed project area, is classified as attainment for the state and federal standards for nitrogen dioxide (NO_2), sulfur dioxide (SO_2), CO, sulfates, and lead except in Los Angeles County, and is classified as attainment for the federal PM10 standards but non-attainment for the state PM10 standards and lead in Los Angeles County. This section also shows 2012 – 2013 criteria pollutants emitted by the Refinery. This section also provides information on local toxic air contaminant concentrations in the vicinity of the Refinery and an inventory of GHG emissions in the Basin. Finally, federal, state, and local air quality regulations are identified.

1.8.3 HAZARDS AND HAZARDOUS MATERIALS

The Tesoro Los Angeles Refinery handles hazardous materials with the potential to impact people, property, or the environment. An accidental release of hazardous materials at a facility can occur due to natural events, such as earthquakes, and non-natural events, such as mechanical failure or human error. Potential existing hazards from the Refinery are those associated with accidental releases of toxic/flammable gas, toxic/flammable liquefied gas, and flammable liquids. Potential hazards at a refinery include toxic gas clouds, fires, vapor cloud explosions, thermal radiation, and overpressure. Risks are also associated with transportation, including truck transport, rail transport, and pipeline transport. This section describes existing risks at the Refinery from units that will be affected by the proposed project.

Historic operations at the Refinery have resulted in accidental releases of hazardous materials (primarily petroleum hydrocarbons) to soil and groundwater in some areas of the Refinery. State and federal laws require detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of to prevent or mitigate injury to human health or the environment in the event that such materials are accidentally released. Local laws and regulations that address accidental release, storing, transport, and handling are also describe in the section.

1.8.4 HYDROLOGY AND WATER QUALITY

Water issues in Los Angeles County are complex and affect supply, demand and quality of water for domestic, commercial, industrial and agricultural use. Extensive urbanization in the Carson/Wilmington area has resulted in significant alteration and deterioration of the natural hydrologic environment. The Tesoro Los Angeles Refinery consumed approximately 18 million gallons of water per day in 2012/2013 from potable water, Refinery owned wells, and recycled water (see Table 3.4-1 for use details).

Wastewater streams from the Carson Operations include process wastewater, boiler and cooling tower blowdown, sanitary wastewater, and surface runoff. Process wastewater streams are treated by the Carson Operation's existing wastewater treatment facilities prior to discharge to the Los Angeles County Sanitation District (LACSD) sewer system. Wastewater from the

Carson Operations is treated and sampled in compliance with the LACSD Industrial Wastewater Discharge Permit. The LACSD places limitations on wastewater parameters such as oil and grease contents, pH levels, temperature, heavy metals, organic compounds and other constituents. Wastewater that complies with the LACSD permit requirements is discharged to the sewer. Wastewater that does not comply is returned to the wastewater treatment system for further treatment. The Carson Operations is also permitted to discharge stormwater commingled with treated process water to Dominguez Channel.

The Carson Operations discharged an average of 4.07 million gallons per day of wastewater during 2012 and 2013 to the sewer system. The Carson Operation's current Industrial Wastewater Discharge Permit allows discharge of up to 5.25 million gallons per day to the LACSD sewer system.

The Wilmington Operations discharged an average of 2.88 million gallons per day of wastewater based on a 2012/2013 average. The Wilmington Operation's current Industrial Wastewater Discharge Permit allows discharge of 3.24 million gallons per day. The Wilmington Operations maintains on-site wastewater treatment equipment. Wastewater from the Wilmington Operations is treated and sampled in compliance with the LACSD Industrial Wastewater Discharge Permit.

The Tesoro Los Angeles Refinery is located on the Dominguez Channel and approximately 1.5 miles west of the Los Angeles River. The Los Angeles River and the Dominguez Channel are the major drainages that flow into the Los Angeles-Long Beach Harbor complex. Sediments and contaminants are transported into the harbor with the flows from the Los Angeles River and, to a lesser degree, the Dominguez Channel.

Runoff from the Wilmington and Carson Operations is collected, treated (if applicable), and discharged under the requirements of the existing storm water permit, National Pollutant Discharge Elimination System (NPDES) permit or the Industrial Wastewater Discharge Permit.

1.8.5 NOISE

The existing noise environment at the Refinery and in the vicinity of the Refinery is dominated by refining operations and mobile sources including trucks, cranes, locomotive engines, and other heavy industrial activities. Noise sources in the area currently include: (1) mobile and stationary sources at the Wilmington and Carson Operations; (2) rail traffic and related maintenance and service activities at adjacent rail yards; (3) noise from adjacent industrial facilities; (4) the Alameda Corridor; and (5) traffic along the State Route 102, Interstate 405, Pacific Coast Highway, and other local streets, e.g., Alameda Street, Wilmington Avenue, and Sepulveda Boulevard.

Noise-sensitive receptors are defined as residences, schools, hospitals, libraries, places of worship, and public parks. Although there are numerous sources of noise in the area, there are few sensitive receptors. The closest noise sensitive receptors to the proposed project locations within the Refinery include: (1) a residential area on the corner of Merimac Avenue and West Willard Street approximately 2,000 feet east of the Tesoro Wilmington Operations; (2)

residential area near Mauretania Street and Goodrich Avenue; (3) residential areas west of the Drumm Avenue/East Sandison Street intersection; and (4) residential areas west of Wilmington Avenue near East Pacific Street. There are numerous commercial receptors located adjacent to both Wilmington and Carson Operations, as well as numerous industrial receptors.

Based on a recent noise survey conducted during August and September 2014 to determine the existing ambient noise levels in the vicinity of the Refinery, the Community Noise Equivalent Level (CNEL) in the vicinity of the closest residential areas ranges between 68 and 73 decibels (dBA). The existing CNEL at an industrial area, adjacent to the Wilmington Operations is about 76 dBA. This section also describes the various state and local noise regulations, as well as, criteria in the Noise elements in the General Plans for the cities of Los Angeles and Carson to limit excessive noise levels for a variety of land uses.

1.8.6 SOLID AND HAZARDOUS WASTE

A total of 11 Class III active landfills and two transformation facilities are located within Los Angeles County with a total disposal capacity of 43,648 tons per day and 3,240 tons per day, respectively.

In 2012, residents and businesses in Los Angeles County disposed of 8.72 million tons of solid waste at Class III landfills and transformation (i.e., refuse to energy) facilities located in and out of the County. In addition, the amount of inert waste disposed at permitted inert waste landfills totaled 89,142 tons.

Presently, two transformation facilities operate in Los Angeles County with a combined average daily tonnage of 1,825 tons per day in 2012, or about 569,539 tons per year. It is expected that these two facilities will continue to operate at their current permitted daily capacity during the planning period of 2012 through 2027.

Los Angeles County Department of Public Works conducted a survey requesting landfill operators in the County to provide updates to their estimated remaining disposal capacity. Based on the results of the survey and considering permit restrictions, the total remaining permitted Class III landfill capacity in the County is estimated at 129.2 million tons as of December 31, 2012.

The average amount of solid waste generated by the Tesoro Carson and Wilmington Operations during 2012/2013 was ~~an average of 39,099~~14,874 tons per year~~ of solid waste during 2012/2013~~.

Two hazardous waste landfill facilities within California are the Chemical Waste Management (CWM) Kettleman Hills facility in King’s County, and the Clean Harbors Environmental Services facility in Buttonwillow (Kern County). On May 21, 2014 DTSC finalized a permit modification which allowed the Kettleman Hills facility to increase its capacity by about five million cubic yards. Buttonwillow is a 320-acre landfill operated by Clean Harbors Environmental Services Environmental Services and can accept in excess of 200 loads of waste per day. Buttonwillow has a remaining capacity of approximately 8,890,000 cubic yards or approximately 40 years.

1.8.7 TRANSPORTATION AND TRAFFIC

This section provides an overview of regional and local traffic circulation and facilities in the vicinity of the proposed project. The operating characteristics of an intersection are defined in terms of the level of service (LOS), as represented by intersection volume to capacity (V/C) ratio. LOS describes the quality of traffic flow based on variations in traffic volume and other variables such as the number of signal phases. For signalized intersections, it is measured from LOS A (excellent conditions) to LOS F (very poor conditions). Intersections that operate at LOS A to C operate well. Level C normally is taken as the design level in urban areas outside a regional core. Level D typically is the level for which a metropolitan area street system is designed. Level E represents volumes at or near the capacity of the highway which will result in possible stoppages of momentary duration and fairly unstable traffic flow. Level F occurs when a facility is overloaded and is characterized by stop-and-go (forced flow) traffic with stoppages of long duration.

Peak hour LOS analyses were developed for 13 intersections in the vicinity of the Refinery. The LOS analysis indicates typical urban traffic conditions in the area surrounding the Refinery, with all intersections operating at Levels A to D during morning and evening peak hours. One intersection currently operates at LOS D (without the proposed project), Wilmington Avenue/Interstate 405 southbound ramps during the morning peak hour. All other intersections operate at LOS A to C during both morning and evening peak hours. This section also provides an overview of applicable state and local traffic laws, ordinances, and General Plan goals.

1.9 EXECUTIVE SUMMARY – CHAPTER 4: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Chapter 4 assesses the potential environmental impacts of the construction and operation of the Tesoro Los Angeles Refinery Integration and Compliance Project. Chapter 4 evaluates those impacts that are considered potentially significant under the requirements of CEQA, as determined by the NOP/IS (see Appendix A). Specifically, an impact is considered significant under CEQA if it leads to a "substantial, or potentially substantial, adverse change in the environment." Table 1.9-1 (located at the end of this chapter) summarizes the impacts of the proposed project.

The proposed project has potential direct impacts to environmental resources (i.e., air quality, hazards and hazardous materials, hydrology and water quality, noise, solid and hazardous waste, and transportation and traffic). In addition, the proposed project may have indirect impacts on upstream or downstream equipment by causing increased utilization from operational changes, even though the equipment is operating within permit limits and no permit modification would be required. Due to the nature of Refinery operations, all equipment activity levels may continue to fluctuate on a monthly or even daily basis. As discussed in Section 2.5.4 and associated subsections, while the proposed project does not affect the types of crude oils processed at the

Refinery and thus will not have impacts due to changes in crude oils, the proposed project may affect downstream unit processing rates. Those indirect impacts are expected to occur in the following units; Wilmington Operations units downstream of the Coker (from H-100 duty increase and potential crude capacity increase), Hydrotreating Unit No. 3, Catalytic Reforming Unit No. 2, and tanks; and, Carson Operations FCCU, Cogen, and tanks. The impacts associated with these indirect impacts are also evaluated in the EIR.

1.9.1 AIR QUALITY

1.9.1.1 Environmental Impacts

Project-specific air quality impacts associated with increases and decreases in emissions of air contaminants (both criteria air pollutants and TACs) during the construction and operation phases of the proposed project are discussed in Chapter 4, as well as impacts to sensitive receptors.

Construction emissions were calculated for peak day construction activities in each month construction is expected to occur. Construction activities associated with the modifications to the Refinery would result in emissions of CO, VOC, NOx, SOx, PM10, and PM2.5. The peak construction phase of the proposed project will exceed the regional significance threshold for VOC and NOx. The largest source of emissions is associated with construction equipment. Therefore, unmitigated air quality impacts associated with construction are considered significant.

The Localized Significance Threshold (LST) analysis at sensitive receptors for construction CO, NO_2, PM10, and PM2.5 emissions was conducted and indicates that NO_2 emissions are expected to exceed significance thresholds due to construction activities associated with the proposed project. The maximum exceedances occur approximately 1,300 feet west of the Wilmington Operations. Therefore, the localized air impacts from proposed project would be considered significant during construction.

Operational emissions associated with the proposed project include stationary and mobile source emissions. Emission increases are expected from the new SARP, PSTU, crude storage tanks, as well as fugitive emissions associated with modifications to existing units (e.g., HTU-1, HTU-2, HTU-4, No. 51 Vacuum Unit, LPG Rail Unloading, etc.). Emission increases are also associated with mobile sources including locomotive engine and truck emissions. The proposed project includes the shutdown of the Wilmington Operations FCCU, which is a major source of emissions. The proposed project is expected to generate emission reductions of CO providing an emissions benefit and a less than significant increase in VOC, NOx, SOx, PM10, and PM2.5 emissions. Additionally, mobile source criteria pollutant and GHG emission reductions from marine vessels are expected to occur from improving the unloading rate of crude oil deliveries at the Marine Terminal. Therefore, no significant adverse operational air quality impacts are expected from the proposed project.

Due to the complexity and duration of the Refinery integration, some project components are expected to be implemented prior to the shutdown of the Wilmington Operations FCCU (referred to as the Interim Operations Scenario). To assess the interim impact of the proposed project, the project components that will be operational in advance of the shutdown of the Wilmington Operations FCCU have been evaluated. Project components included in the Interim Operations Scenario include the Wilmington Operations DCU H-100 Heater Duty Bump, and fugitive emissions from the Wilmington Operations HCU and Carson HCU Mods, LHU Mods, and Mid Barrel Distillate Treater. The expected interim emissions are less than significant.

An additional transitional period is expected to occur to facilitate the integration of the Refinery and the shutdown of the Wilmington Operations FCCU. The transitional period is expected to be approximately 90 days prior to the Wilmington Operations FCCU shutdown, when Refinery units will become operational while the Wilmington Operations FCCU remains operating. The transitional period is expected to create a temporary increase in emissions that when combined with the concurrent on-going construction of other portions of the proposed project will have significant air quality impacts). The transitional period operational emissions increase will cease and become the reduced emissions discussed previously following the shutdown of the Wilmington Operations FCCU and completion of the proposed project.

There are substantial emission reductions in CO from the proposed project, which will provide a beneficial air quality impact. NOx, SOx, PM10, and PM2.5 will have local emissions benefits, but will be regionally neutral as RECLAIM (RTCs) and Emission Reduction Credits (ERCs) will be retained or generated. VOC emission increases from direct stationary sources associated with the proposed project will be offset using concurrent emission reductions or ERCs as required by SCAQMD Regulation XIII for emission increases greater than one pound per day from newly permitted and modified existing permitted emission sources. Use of emission offsets will reduce potential air quality impacts associated with emission increases from stationary sources, including fugitive emissions. Equipment that will use concurrent emission reductions will be restricted by SCAQMD permit conditions to ensure the Wilmington Operations FCCU is shutdown to provide the necessary offsets.

Dispersion modeling was used to calculate ambient air concentrations of the criteria pollutants from the project sources which emit CO, NOx, SOx, PM10, and PM2.5 emissions during operation of the proposed project and to determine the localized impacts. Based on the AERMOD air dispersion model results, the ground-level concentrations of the criteria pollutants of concern will be below SCAQMD CEQA significance thresholds. Therefore, no significant adverse localized air quality impacts are anticipated to occur from the operation of the proposed project.

To provide a comprehensive analysis of toxic air contaminants and non-cancer toxic air contaminant impacts, risks were calculated using currently adopted guidance. Based on the air quality modeling and related assumptions, the incremental cancer risk to the Maximum Exposed Individual Worker (MEIW) associated with TAC emissions from the proposed project was calculated to be 9.3~~2~~ in one million. The incremental cancer risk to the Maximum Exposed Individual Resident (MEIR) associated with TAC emissions from the proposed project was calculated to be 3.7~~6~~ in one million. The incremental cancer risk to the nearest non-residential sensitive receptor associated with the proposed project was calculated to be 2.1 in one million.

The predicted cancer risks does not exceed the cancer risk significance threshold of 10 per million; therefore, the carcinogenic health risks are considered to be less than significant.

The maximum chronic hazard index (MCHI) is located just east of the southern portion of the facility. The MCHI for the proposed project is 0.106~~127~~, which is below the 1.0 significance threshold. Therefore, the chronic hazards generated by the proposed project are considered to be less than significant.

The maximum 8-hour chronic hazard index is located on the northwestern boundary of the Wilmington Operations. The maximum 8-hour chronic hazard index for the proposed project is 0.108, which is below SCAQMD's chronic hazard index significance threshold of 1.0. Therefore, the peak chronic non-cancer health hazards generated by the proposed project are considered to be less than significant.

The maximum acute hazard index (MAHI) is located just west of the southern portion of the facility. The MAHI for the proposed project is 0.052, which is below the 1.0 significance threshold. Therefore, the acute hazards generated by the proposed project are considered to be less than significant.

1.9.1.2 Mitigation Measures

Feasible mitigation measures are required to minimize the significant air quality impacts associated with the construction phase of the proposed project as the emissions of VOC~~, CO,~~ and NOx are considered significant. Mitigation measures A-1 through A-9 have been imposed which include maintaining a Construction Management Program that incorporates the imposed mitigation measures and Best Management Practices. Mitigation measures include requirements for: prohibiting truck and construction equipment idling in excess of five minutes at the Refinery, maintaining construction equipment to optimize emissions, requiring the use of on-road heavy-duty trucks greater than 19,500 pounds or greater that are compliant with EPA 2007 on-road emissions standards, utilizing electric welders where feasible, utilizing on-site power where available, using equipment rated 50 and greater equipped with Tier 4 or equivalent engines, and suspending all construction activities that generate air pollutant emissions during first stage smog alerts. Additionally, Tesoro will implement selective catalytic reduction catalyst change outs as specified in mitigation measure A-9. The mitigation measures are expected to reduce construction emissions; however, construction emissions are expected to remain significant.

During the 90-day transitional period, when construction activities are on-going, VOC~~, CO,~~ and NOx emissions will remain significant. Therefore, the 90-day transitional period combined with construction activities associated with the proposed project are expected to cause significant adverse construction air quality impacts and no additional feasible mitigation has been identified that would reduce the localized impacts during construction.

No mitigation measures are required for the operational phase because no significant air quality impacts were identified. Emissions of CO were calculated to be emission reductions. VOC, NOx, and SOx, PM10, and PM2.5 emissions were calculated to be less than significant. BACT will be required for all new and modified sources with emissions increases.

1.9.1.3 Level of Significance after Mitigation

Regional construction emissions for the proposed project for VOC and NOx are expected to remain significant following mitigation. The regional construction emissions associated with CO, SOx, PM10, and PM2.5 are expected to remain less than significant following mitigation. Construction emissions are expected to be short-term and they will be eliminated following completion of the construction phase.

Localized significant impacts from construction activities were analyzed for ~~CO,~~ NO_2, PM10, and PM2.5. The construction activities associated with the proposed project are expected to cause a significant impact on ambient air quality. While mitigation measures have been imposed, construction air quality impacts would remain significant.

The proposed project is not expected to have significant adverse CO, NOx, SOx, VOC, PM10, or PM2.5 emission impacts during operation. Further, ambient air quality modeling indicates that the proposed project emissions of CO, NO_2, PM10, and PM2.5 during operation of the proposed project would not cause or contribute to an exceedance of any ambient air quality standard. Therefore, the operation of the proposed project is not expected to cause a significant adverse impact on ambient air quality and no mitigation measures are required.

The proposed project was analyzed for cancer and non-cancer human health impacts and determined to be less than significant. The estimated cancer risk due to the operation of the proposed project is expected to be less than the significance criterion of 10 in one million. The chronic and acute hazard indices are expected to be below 1.0. Therefore, the proposed project is not expected to cause a potentially significant adverse impact associated with exposure to TAC.

1.9.2 HAZARDS AND HAZARDOUS MATERIALS

1.9.2.1 Environmental Impacts

1.9.2.1.1 On-site Hazards

The potential hazards associated with the proposed project are common to most oil processing facilities worldwide, and are a function of the materials being processed, processing systems, procedures used for operating and maintaining the facility, and hazard detection and mitigation systems. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and the process conditions. For hydrocarbon fuel and petrochemical facilities, the possible hazards are: toxic gas clouds (e.g., gas with hydrogen sulfide, sulfur dioxide, or sulfur trioxide); flash fires; torch fires; pool fires; boiling liquid expanding vapor explosions (BLEVEs); and, vapor cloud explosions.

In order to determine the hazards from the existing and proposed units and modifications, the CANARY consequence analysis models were used. See Chapter 3.3 and Appendix C for more details on the model and related assumptions. The maximum vulnerability zones (also referred to as hazard zones) for the existing equipment and proposed changes were evaluated for the new or modified units associated with the proposed project. The maximum hazard zone identifies the area where the injury thresholds would be potentially exceeded in the event of an upset. For each potential release, the distance to the significance threshold level was determined before and after the proposed project modifications (where applicable). For new units, the distance to the threshold level for each release was determined.

The new and modified units that have the ability to create a hazard that could extend further off-site include the Naphtha Isomerization Unit and new crude tanks at the Carson Operations, and the Sulfuric Acid Recovery Plant at the Wilmington Operations. The hazards associated with the Interconnecting Pipelines would also extend off-site as portions of the pipeline are located off-site. The hazards associated with the Naphtha Isomerization Unit, new crude tanks, and Interconnecting Pipelines would only impact the roadways adjacent to the Refinery or other industrial areas (e.g., other refineries, rail yards). The hazards associated with the Sulfuric Acid Regeneration Plant are potentially significant in the event of a worst-case release of sulfur dioxide and could extend up to about 1,905 feet. Although the hazard would avoid residential areas, several houses are located within industrial areas and the projected sulfur dioxide hazard zone, so there could be impacts to residents in the event of a worst-case release. Therefore, the hazard impacts associated with the proposed project are potentially significant.

1.9.2.1.2 Transportation Hazards

The proposed project would increase the transport of fresh and spent caustic trucks using <u>trucks and </u>railcars specifically designed for caustic transport. Using the maximum estimated total combined truck mileage of 45 miles per day, the potential for an accident involving a caustic truck is 0.000002 (45 miles per day / 1 million miles x 0.04 accidents/million miles driven) or approximately one accident every 555,556 years. Though it is difficult to compare hazardous and non-hazardous transport risk, the differences appear to be significant enough to conclude that the magnitude of non-hazardous transport accidents dominates highway transport risk. The specific hazardous material trucking regulations discussed in Section 3.3.7 and additional care provided by carriers and shippers of hazardous materials appear to be reducing the accident rate for hazardous material shipments. Because hazardous materials are currently transported by truck, the consequences of an accident would not change. Therefore, the probability for an adverse impact from truck transport of hazardous materials is extremely low and the potential hazard impact related to truck transport from the proposed project is less than significant.

The proposed project is expected to increase the shipment of caustic by rail. The approximately 110,880 gallons (2,640 barrels) of spent caustic per week will be loaded onto railcars for transport to the Gulf Coast for regeneration. Therefore, the proposed project will add about four railcars per week of spent caustic acid to existing trains that are currently transporting spent caustic from the Refinery. Using the maximum estimated trips travel to the state line of 277 miles per railcar for four railcars, the potential for a serious incident involving a caustic railcar is 0.00007 (1,110 miles per day / 1 million miles x 0.08 accidents/million railcar miles) or approximately one accident every 11,760 years. Because hazardous materials are currently transported by rail, the consequences of an accident would not change. Therefore, the probability for an adverse impact from rail transport of spent or fresh caustic from the proposed project is extremely low and less than significant.

The proposed project is also expected to increase the number of LPG railcars by a maximum of 10 per day. The~~se~~ additional LPG ~~railcars~~ will be transported in railcars specifically designed to transport LPG and added to existing rail shipments. Using the maximum estimated trips travel of 605 miles per day per railcar for 10 railcars, the potential for a serious incident involving a LPG railcar is 0.0002 (6,050 miles per day / 1 million miles x 0.03 accidents/million railcar miles) or approximately one accident every 6,081 years. Therefore, the probability for an adverse impact from rail transport of LPG is extremely low and the potential hazard impact related to rail transport from the proposed project is less than significant.

1.9.2.1.3 Hazard Impacts During Construction

In the event contaminated soil or groundwater is encountered, exposure is expected to be limited to on-site construction workers. Construction workers at the Refinery and other locations are protected by numerous existing rules, regulations and requirements and have been professionally trained to safely work around the potentially hazardous conditions that exist within a refinery. Compliance with these laws and internal Refinery safety procedures will ensure that any worker exposure is less than significant. Because the nearest residential receptors are located 1,000 and 2,000 feet from the two locations where hydrocarbon exceeds the SCAQMD Rule 1166 50 ppm requirement, it is unlikely that they will be exposed to hydrocarbons exceeding 50 ppm.

1.9.2.2 Mitigation Measures

There are a number of rules, regulations, and laws governing the refinery operations that will minimize the potential adverse impacts associated with hazards at the facility and which would minimize the hazards associated with the Naphtha Isomerization Unit, new crude storage tanks, SARP, and Interconnecting Pipelines. Mitigation measure HHM-1 would require the applicant to demonstrate compliance with applicable hazardous material rules and regulations prior to the startup of the new or modified units, to include, at minimum, an Emergency Action Plan as required by the Fire Department addressing spill, fire, and explosion hazards and relative risk of upset to adjacent land uses; PSM requirements under 40 CFR Part 1910, Section 119, and Title 8, CCR, Section 5189; and Article 2, Chapter 6.95 of the California Health and Safety Code that require facilities that handle listed regulated substances to develop RMPs to prevent accidental releases of these substances prior to commencement of operations. Other than mitigation measure HHM-1, no other feasible mitigation measures have been identified, over and above the extensive safety regulations that currently apply to the Tesoro Refinery.

1.9.2.3 Level of Significance after Mitigation

The impacts of the proposed project on hazards associated with the Naphtha Isomerization Unit, new crude tanks, SARP, and Interconnecting Pipelines are expected to be significant.

Compliance with existing PSM, RMP, and CalARP regulations and implementation of the recommended safety measures would minimize the potential impacts associated with a release, but are not expected to eliminate the potential hazard impacts. No feasible mitigation measures were identified to further reduce significant adverse hazard impacts. Therefore, hazards and hazardous material impacts generated by the proposed project are expected to remain significant.

With respect to potential worker exposure to soil and groundwater contamination, compliance with existing regulations and implementation of the proposed project safety measures are intended to minimize the potential impacts associated with excavation. Such compliance is expected to reduce the potential hazard impacts associated with hydrocarbon-contaminated soil and groundwater. Therefore, hazards and hazardous material impacts generated by excavation activities associated with the proposed project are expected to be less than significant.

1.9.3 HYDROLOGY AND WATER QUALITY

1.9.3.1 Environmental Impacts

Water demand during construction is limited to water applied for dust suppression and water needed to perform hydrostatic testing. The maximum total daily potable water demand during construction is expected to be a maximum of 40,000 gallons per day (gpd), which is less than the significance threshold of 262,820 gpd. Therefore, the proposed project will have less than significant impacts on water supply during construction.

The water used for the hydrostatic testing tanks and associated piping will be Refinery wastewater that is diverted for testing prior to discharge to the industrial sewer system. Using diverted wastewater will not increase the amount of wastewater generated by the Refinery, but will vary the discharge rate during construction. It is expected that for a total of approximately four to six weeks distributed over the construction period, a temporary daily increase in water discharge will occur at the completion of hydrostatic testing. No permit modification or new wastewater treatment facilities are needed to accommodate the temporary increase in discharge of wastewater during testing from the Carson or Wilmington Operations.

The Refinery currently uses on average about 13.8 million gpd of fresh/potable water and about 4.5 million gpd of reclaimed water in its operations. The direct water demand of the proposed project is expected to require an estimated increase in water demand of 76.5 gallons per minute (110,160 gpd). An additional 81,115 gpd of water demand is associated with the indirect effects of the proposed project. The combined total of the proposed project direct and indirect water demand is 191,275 gpd which is less than the significance threshold of 262,820 gpd. The Refinery has adjudicated water rights that allow the production of up to 2.8 billion gallons of water per year from its wells. Therefore, the proposed water supply impacts are expected to be less than significant.

The proposed project is expected to reduce overall wastewater generated during operation at the Refinery by an estimated 55.1 gpm (77,344 gpd). This is due, in large part, to the shutdown of the Wilmington Operations FCCU. While there will be wastewater increases from some operations, such as the SARP, the proposed project will reduce wastewater generation, and adequate capacity in the existing wastewater treatment facilities is available. Therefore, no new wastewater treatment facilities are needed and the existing facilities are adequate to meet the needs of the proposed project. As such, the proposed project impacts to water quality would be less than significant.

1.9.3.2 Mitigation Measures

No significant impacts associated with water demand and wastewater discharge are expected from the proposed project, so no mitigation measures are required.

1.9.3.3 Level of Significance after Mitigation

The proposed project impacts on hydrology and water quality are expected to be less than significant.

1.9.4 NOISE

1.9.4.1 Environmental Impacts

Proposed project construction is anticipated to increase noise levels temporarily at noise-sensitive receptors in the vicinity of the Tesoro Los Angeles Refinery, as heavy construction equipment is required during construction activities associated with the proposed project. Noise from construction activities is generated by a broad array of construction equipment. These noise sources will operate primarily during daylight hours and will be a source of noise over the construction period.

Three dimensional noise models of the proposed project were created using the noise modeling software, SoundPLAN. Actual noise monitoring in the vicinity of the Refinery was used to estimate baseline noise levels. The noise model was used to determine the potential proposed project noise impacts during construction and operational activities.

The noise impacts associated with construction activities would add less than 3.0 dBA to the adjacent residential communities, including all noise-sensitive receptors. The noise levels at the closest residential areas are expected to increase from 0.1 to 0.9 dBA depending on the location and the time of day. An increase of 0.9 dBA is less than the significance threshold of 3.0 dBA. The proposed project noise impacts during the construction phase are expected to be less than significant.

The proposed project will add equipment to the existing Refinery so that there will be additional noise sources at the facility. Additional noise sources associated with the proposed project generally include process equipment components such as valves, flanges, vents, pumps, air coolers, scrubber, as well as new equipment associated with the Wet Jet Treater, PSTU and SARP.

The noise model predicted that the CNEL levels within residential areas would increase by less than 3.0 dBA as a result of the operation of the proposed project. The only noise increase (0.1 dBA) is the residential area west of Alameda Street, north of Pacific Coast Highway. The noise levels associated with the operation of the proposed project is expected to be similar or the same as existing noise levels at all residential receptors adjacent to the Refinery. The noise increases at all receptor locations are predicted to be less than 3.0 dBA and, therefore, noise impacts associated with the operation of the proposed project would be less than significant.

Construction of the proposed project would involve equipment and activities that may have the potential to generate groundborne vibration. Vibration impacts were evaluated using the Federal Transit Administration published standard vibration levels and peak particle velocities for construction equipment operations. The estimated vibration from construction activities is less than the FTA vibration impact level, so no significant vibration impacts are expected during the construction period. Equipment associated with operation of the proposed project is not expected to generate detectable groundborne vibration during normal operation because new and modified equipment is not expected to have oscillating parts that have the potential to generate groundborne vibration.

1.9.4.2 Mitigation Measures

No significant adverse impacts associated with noise or vibration are expected from the proposed project during construction or operational phases, so no mitigation measures are required.

1.9.4.3 Level of Significance after Mitigation

The noise and vibration impacts of the proposed project during construction and operational activities are expected to be less than significant.

1.9.5 SOLID AND HAZARDOUS WASTE

1.9.5.1 Environmental Impacts

Solid waste (i.e., construction debris and uncontaminated soil) generated during construction of the proposed project that may require disposal will be stored on the Refinery property prior to disposal at one of the landfills in southern California. The landfills in southern California have the capacity to accept the solid waste produced during the construction phase of the proposed project on a one-time basis. In addition, because a percentage of this solid waste has economic value (steel) or can be recycled (concrete), the amount of solid waste generated on a daily basis is expected to be relatively small compared to the total amount of solid waste generated in Los Angeles County. Therefore, the proposed project is not expected to result in a significant impact on solid waste during the construction phase.

Site preparation, grading, and construction activities for the proposed project have the potential to encounter contaminated soils. The project estimates that a total of approximately 290,148 cubic yards of contaminated soil may require removal and disposal: of that, approximately 83,213 cubic yards would be hazardous materials, and approximately 206,953 cubic yards would be non-hazardous materials. In the event that the material still requires disposal (i.e., cannot be treated/remediated), the Kettleman Hills facility has sufficient available capacity (5,000,000 cubic yards) and the Clean Harbors Buttonwillow facility has available capacity (over 8,000,000 cubic yards) to accept the total amount of estimated one-time contaminated soil waste generated by construction activities associated with the proposed project. Since the amount of disposal capacity necessary to dispose of contaminated soils is well below the capacity of the available Class I landfills, no significant adverse hazardous waste impacts will occur from the proposed project.

Once the proposed project becomes operational, the average annual amounts of solid waste are not expected to change because there would be no increase in the number of workers and refinery units do not typically generate solid waste.

Operation of the proposed project may generate solid or hazardous waste streams; however, those waste streams are expected to be reused or recycled. Spent caustic will be generated by the Wet Jet Treater and from scrubbers on the SARP. Spent caustic will be recycled off-site and would not require disposal.

Periodic maintenance of the storage tanks could generate sludge during tank cleaning operations which occur once every ten to 20 years. The sludge would be recycled on-site in the DCU; therefore, no increase in waste disposal would be expected from operation of the new and modified storage tanks.

While operation of the proposed project may generate solid or hazardous waste streams, those waste streams are expected to be reused or recycled. Therefore, operation of the proposed project is not expected to require additional waste disposal capacity and will not interfere with the Tesoro Refinery's ability to comply with existing federal, state, and local regulations for solid and hazardous waste handling and disposal. Therefore, significant solid and hazardous waste impacts are not expected from construction and operation of the proposed project

1.9.5.2 Mitigation Measures

No significant adverse impacts associated with solid or hazardous waste are expected from the proposed project during construction or operational phases, so no mitigation measures are required.

1.9.5.3 Level of Significance after Mitigation

No significant adverse solid or hazardous waste impacts are expected.

1.9.6 TRANSPORTATION AND TRAFFIC

1.9.6.1 Environmental Impacts

Initial construction activities for the proposed project are expected to begin in the third quarter of 2016 and are expected to be completed by second quarter of 2021. The construction activities for most of the components of the proposed project are expected to overlap in the first three years (peak construction period). Construction work shifts are expected to last about ten hours per day during most portions of the construction schedule. During normal construction periods, one work shift per day is expected. During Refinery turnaround periods (when some of the Refinery Units are shut down), two work shifts are expected and work may be conducted 24 hours per day. Shifts would operate from 6:00 a.m. to 6:00 p.m. and 6:00 p.m. to 6:00 a.m.

Construction conditions are analyzed for the construction phase with the maximum number of construction trips during the construction period. The traffic analysis is based on the preliminary construction schedule that included a total of 950 workers, 875 day shift workers and 75 night shift workers. Following the traffic study, the construction schedule has been refined and the number of workers has decreased to 696. The decrease in total trips is within the margin of accuracy. The traffic analysis is based on up to 950 construction workers travelling to and from the proposed project site during the highest trip-generation phase of construction of the proposed project. In addition to worker trips, 120 truck trips would be generated during the peak trip-generating construction phase throughout the work day.

Caltrans began a major construction project to modify the Interstate 405/Wilmington Avenue interchange starting November 2013, and continuing during the baseline conditions of the proposed project. The interchange construction is expected to finish in late 2016 or early 2017, potentially overlapping with the near-term construction period of the proposed project, which would result in significant construction traffic impacts. LOS analysis was conducted to evaluate existing plus construction intersection conditions during the a.m. and p.m. peak hours. The LOS at all intersections is expected to be LOS A, B or C at all intersections, except Wilmington Ave./Interstate 405 Southbound Ramps during the morning peak hour. The construction-related trips are forecast to result in a significant impact during construction conditions at the Wilmington Ave/Interstate 405 Southbound Ramps.

Following construction, no increase in the number of workers required to operate the Refinery is expected. Therefore, there would be no long-term parking or traffic impacts associated with the proposed project.

1.9.6.2 Mitigation Measures

Mitigation measure TT-1 will be imposed to reduce the proposed project’s construction-related trips on the Wilmington Avenue/Interstate 405 Southbound Ramps intersection prior to the completion of the Interstate 405/Wilmington Avenue Interchange Project. Mitigation measure TT-1 requires the applicant to implement a traffic management plan to address project traffic impacts prior to the completion of the improvements at the Wilmington Avenue/Interstate 405

Southbound Ramps intersection. The traffic plan will require that project workers be advised of the construction schedule and potential restrictions and closures associated with the Interchange Modification Project and will be required to avoid the Wilmington Avenue/Interstate 405 Southbound Ramps intersection during morning peak travel periods by traveling either outside of the morning peak travel time or along alternative routes. Additionally, construction workers shall be encouraged to participate in ridesharing to lessen the number of vehicles transiting to the Refinery.

1.9.6.3 Level of Significance after Mitigation

The impacts of the proposed project on traffic and circulation are expected to be less than significant following implementation of mitigation measure TT-1 because traffic will be routed to avoid the Interstate 405/Wilmington Avenue Interchange Project.

1.9.7 SIGNIFICANT UNAVOIDABLE IMPACTS

CEQA requires an EIR to discuss significant environmental effects and irreversible environmental changes which would result from a proposed project, should it be implemented. It was determined that implementation of the proposed project would result in potentially significant adverse impacts on air quality during construction and temporary exceedance of the localized significance thresholds. Long-term operational air quality impacts are not expected to have a significant adverse impact on the environment but would, in fact, provide beneficial local air quality impacts by reducing overall emissions of CO, NOx, and SOx, as well as GHG emissions. Therefore, the proposed project is not expected to have long-term adverse environmental impacts on air quality.

The proposed project could result in significant impacts related to the "worst case" hazard impacts associated with the proposed modifications to the Naphtha Isomerization Unit, the proposed new crude tanks, SARP, and Interconnecting Pipelines. Compliance with existing PSM, RMP, and CalARP regulations and implementation of the recommended safety measures would minimize the potential impacts associated with a release, but are not expected to eliminate the potential hazard impacts. The feasible mitigation measures identified would not reduce the significant adverse hazard impacts to less than significant.

Traffic levels are expected to increase during construction and generate potentially significant adverse traffic impacts. Feasible mitigation measures are expected to reduce traffic impacts to less than significant. Operational traffic levels are expected to remain essentially the same as existing levels. Therefore, no significant adverse impacts for traffic are expected during operation of the proposed project.

The proposed project involves modifications to an existing Refinery, located within an industrial area, which has been operating since the early 1900s. Therefore, there is no major commitment of nonrenewable resources or changes that would commit future generations to specific uses of the environment associated with the proposed project.

1.9.8 ENVIRONMENTAL EFFECTS FOUND NOT TO BE SIGNIFICANT

The analysis provided in Section 4.10 summarizes the NOP/IS, which concluded that the following environmental topics would be less than significant: aesthetics; agriculture and forestry resources, biological resources, cultural resources; energy; geology and soils; land use and planning; mineral resources; population and housing; public services and recreation.

1.9.9 GROWTH INDUCING IMPACTS

The proposed project would help ensure the efficient manufacture of petroleum products at an existing Refinery that has been used for refining purposes since the early 1900s. As a development project occurring in an urban, industrialized, and generally built-out environment, the proposed project would increase long-term stability and the availability of petroleum products. The proposed project is expected to require up to 696 construction workers that would be largely be drawn from the local existing workforce pool. No new employees are expected during operation of the proposed project. The proposed project could result in an increase in the import or refining of about 6,000 bbl/day of crude oil, but would not result in a substantial increase in the production of petroleum products (e.g., gasoline and diesel fuels) to allow significant population growth. The proposed project would not employ activities or uses that would result in growth inducement, such as the development of new infrastructure (i.e., new roadway access or utilities) that would directly or indirectly cause the growth of new populations, communities, or currently undeveloped areas. Likewise, the proposed project would not result in an expansion of existing public service facilities (e.g., police, fire, libraries, and schools) or the development of public service facilities that do not already exist.

1.10 EXECUTIVE SUMMARY – CHAPTER 5: CUMULATIVE IMPACTS

State CEQA Guidelines §15130 requires that an EIR include a reasonable analysis of the significant cumulative impacts of a proposed project. Cumulative impacts are defined by CEQA as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts” (State CEQA Guidelines §15355). There are a number of projects proposed for development in the vicinity of the Refinery, which may contribute cumulative impacts to those generated by the proposed Integration and Compliance Project. The discussion in Chapter 5 lists projects which are reasonably expected to proceed in the foreseeable future, i.e., project information has been submitted to a public agency and is publicly available. Identified impacts from cumulative projects listed in Table 5.1.1 were combined with the proposed project's construction and operational impacts to assess cumulative impacts associated with the proposed project. The cumulative analysis is summarized in the following subsections.

1.10.1 AIR QUALITY

1.10.1.1 Environmental Impacts

1.10.1.1.1 Construction Impacts

The proposed project would contribute to potentially significant cumulative construction air quality impacts if project-specific construction emissions are considered to be cumulatively considerable as defined by CEQA Guidelines §15064(h)(1). Because the proposed project's construction emissions exceed the project-specific VOC and NOx thresholds, it is considered cumulatively considerable and cumulatively significant when considered in combination with related projects. Since CO, SOx, PM10, and PM2.5 construction emissions do not exceed their respective project-specific thresholds, they are not considered to be cumulatively considerable and, therefore, are not considered to contribute to cumulative construction impacts. This conclusion is consistent with CEQA Guidelines §15064(h)(4), which states, "The mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable."

1.10.1.1.2 Operational Impacts

The proposed project includes the shutdown of the Tesoro Wilmington Operations FCCU, which is a major source of emissions. As discussed in Section 4.2.2.2, peak daily emissions associated with the proposed project also would result in emission increases from new and modified units, increased mobile source emissions, and increased utilization of some equipment. The overall change in emissions associated with implementing the proposed project is a reduction in CO emissions and a less than significant increase in VOC, NOx, SOx, PM10 and PM2.5 emissions. As a result, criteria pollutant emissions from the proposed project operation are not considered to be cumulatively considerable and, therefore, are not considered to contribute to cumulative operational emission impacts.

1.10.1.1.3 Toxic Air Contaminants

A health risk assessment was performed to determine if TAC emissions generated by the proposed project would exceed the SCAQMD thresholds of significance for cancer risk and hazard indices. The maximum cancer risk from the proposed project for the resident (MEIR) was determined to be 3.7~~6~~ in one million. The maximum cancer risk to a sensitive receptor was estimated to be 2.1 in one million. The maximum cancer risk at the worker receptor (MEIW) was estimated to be 9.3~~2~~ in one million. The estimated cancer risk at all of the receptors was below the 10 in one million threshold. In addition, the noncancer risks were determined to be 0.106~~127~~, 0.108, and 0.052 for the maximum chronic, maximum 8-hr chronic, and acute hazard indices, respectively, which were also determined to be below the significance threshold of 1.0. Therefore, TAC emissions from the proposed project operation would not make a cumulatively considerable contribution to cumulatively significant impacts for carcinogenic and non-carcinogenic health impacts. Note that the HRA did not include the emission reductions associated with the shutdown of the Wilmington Operations FCCU and only included estimated increases associated with the modification of existing and construction of new units, thus providing a conservative analysis of TAC emissions and related health risk. Therefore, the TAC emission impacts associated with the proposed project are not considered to be cumulatively considerable and are not considered to contribute to cumulative health risk impacts.

1.10.1.2 Mitigation Measures and Cumulative Impacts

The proposed project's construction emissions are cumulatively considerable and cumulatively significant when considered in combination with related projects. Mitigation measures A-1 through A-9 will be imposed on construction activities associated with the proposed project. However, after mitigation, construction emissions are expected to remain above SCAQMD thresholds for VOCs and NOx. Therefore, the construction of the proposed project would make a cumulatively considerable and unavoidable contribution to a cumulative significant impact during construction activities. While increases in operational emissions of VOC, NOx, SOx, PM10, and PM2.5 emissions are expected, which are less than significant, the proposed project is expected to result in reductions in CO emissions providing beneficial air quality impacts. Therefore, operation emissions from the proposed project are not significant, not cumulatively considerable, and are not considered to contribute to cumulative significant impacts for operational emissions, ambient air quality, or exposure to TACs and no mitigation measures are required.

1.10.1.3 Greenhouse Gases

1.10.1.3.1 Greenhouse Gas Emissions from Construction

Construction equipment is assumed to be operational up to ten hours per day, five days per week during most of the construction period. Also, during peak construction periods, two 12-hour work shifts are expected seven days per week. Emission factors for construction equipment were taken from the Construction Equipment Emissions tables in CARB's Offroad Inventory Model. Estimated GHG emissions from construction equipment are included in Table 5.2-1, with more detailed calculations in Appendix B-1.

The project will also include construction equipment working off-site. Emission factors for off-site construction equipment were taken from CARB's EMFAC 2011 Inventory Model. The SCAQMD significance threshold for GHG emissions combines construction emissions amortized over 30 years with operational emissions. The total GHG construction emissions associated with the proposed project are estimated to be 23,173 metric tons over the entire construction period, or 772 metric tons per year amortized over 30 years, which is less than significant.

1.10.1.3.2 Greenhouse Gas Emissions from Operations

The proposed project will result in both GHG emission increases and reductions. GHG emission increases would be associated with the DCU H-100 duty bump, increased utilization of HCU H-300/301, the No. 51 Vacuum Unit Heater, the NHDS Heater, and the proposed new SARP. The reduction in GHG emissions are associated with the shutdown of the FCCU at the Wilmington

Operations. Indirect impacts from equipment potentially impacted by the proposed project were also calculated to determine their effect on the proposed project's overall GHG emissions including the annual increase in Wilmington Operations coke delivery emissions from 1,460 trucks per year to the Port of Long Beach. The proposed project is expected to result in an overall GHG emission reduction of approximately 68,175~~66,139~~ metric tons per year providing a reduction of local GHG emissions. However, per the requirements of AB 32, the number of GHG allowances in California's Cap- and-Trade Program is reduced each year by the California Air Resources Board. An individual project that reduces GHG emissions may reduce local GHG emissions, but will not have an impact on the overall pool of allowances in the GHG Cap-and-Trade Program. Thus, the proposed project is considered to have no effect on state-wide GHG emissions. CEQA Guideline §15130(a) indicates that an EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable. Where a lead agency is examining a project with an incremental effect that is not cumulatively considerable, a lead agency need not consider the effect significant, but must briefly describe the basis for concluding that the incremental effect is not cumulatively considerable. "The mere existence of cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable" (CEQA Guidelines §15064(h)(4)). Therefore the project's contribution to GHG emissions is not cumulatively considerable and thus not significant because the GHG emissions from the Refinery would be less than the existing emissions if the proposed project is implemented (CEQA Guidelines §15130).

1.10.2 HAZARDS AND HAZARDOUS MATERIALS

1.10.2.1 Environmental Impacts

1.10.2.1.1 Construction

A number of cumulative projects have the potential to uncover contaminated soils during construction activities. The construction hazard impacts were considered to be less than significant or mitigated to less than significant for all of the related cumulative projects.

1.10.2.1.2 Operations

All storage tanks are required to provide secondary containment facilities (e.g., berms) that would contain 110 percent of the volume of the storage tanks, which assures that spills remain on-site and not overlap with hazards at other facilities.

New units have the potential to generate off-site impacts that could potentially expose off-site receptors to new hazards, e.g., the SARP (exposure to SO_2), and the new crude storage tanks at the Carson Operations (pool fire), as well as the new Interconnecting Pipelines (flash fire), and modifications to the Naphtha Isomerization Unit (flash fire). Although the project-related hazard impacts would generally be limited to industrial areas, the hazards are potentially significant. Therefore, hazards from the proposed project are considered to be cumulatively considerable and, therefore, are considered to contribute to significant adverse cumulative hazard impacts during operation.

The proposed project would decrease the transportation hazards associated with sulfuric acid as sulfuric acid would be regenerated on-site. However, the proposed project will increase the transportation of LPG via rail and increase the transport of caustic and spent caustic via truck and rail. The proposed project was considered to be less than significant for the transport of hazardous materials by truck and rail. Therefore, the proposed project is not cumulatively considerable as it relates to hazardous material transport and does not contribute to significant adverse hazardous material transport impacts.

1.10.2.2 Mitigation Measures and Cumulative Impacts

The impacts of the proposed project on hazards associated with the Naphtha Isomerization Unit, new crude tanks, and Interconnecting Pipelines are considered significant and are cumulatively considerable. Compliance with existing regulations (e.g., PSM, RMP, and CalARP requirements) and implementation of mitigation measure HHM-1 would further minimize the potential impacts associated with a release, but are not expected to eliminate the potential hazard impacts. No feasible mitigation measures were identified to further reduce significant adverse hazard impacts. Therefore, cumulative hazard impacts would remain significant after implementing the mitigation measures identified for the proposed project.

1.10.3 HYDROLOGY AND WATER QUALITY

1.10.3.1 Environmental Impacts

Water quality impacts associated with the related projects are not expected to result in cumulative impacts. All projects would be required to comply with stormwater pollution prevention requirements during project operation and construction as well as NPDES requirements for commercial and industrial facilities required to obtain such permits. Compliance with existing stormwater and wastewater discharge requirements is expected to ensure cumulative water quality impacts are less than significant.

1.10.3.1.1 Water Demand

The proposed project is expected to increase water demand by about 191,275 gpd which is less than the significance threshold of 262,820 gpd. The incremental increase in water use from the proposed project is expected to be produced by the privately-owned wells (i.e., from the available 2.82 billion gallons per year of adjudicated water rights). The existing water supply can meet the water demand of the proposed project and the daily water use associated with the proposed project is less than 262,820 gpd. Therefore, the proposed project water supply impacts are expected to be less than significant.

Since the Refinery has sufficient adjudicated water rights to support the proposed project's increase in water demand and water demand impacts are less than significant, the proposed project's water demand impacts are not cumulatively considerable. Therefore, the proposed project impacts on water demand are not considered to contribute to cumulative water demand impacts.

1.10.3.1.2 Water Quality

The proposed project is expected to reduce overall wastewater generated at the Refinery. The proposed project will result in an estimated reduction in wastewater of over 79,000 gpd associated with the shutdown of the Wilmington Operations FCCU. Because the proposed project reduces wastewater and demand on wastewater treatment facilities, the proposed project impacts on water quality are not cumulatively considerable and do not contribute to cumulative water quality impacts.

1.10.3.2 Mitigation Measures and Cumulative Impacts

Mitigation is not required because the impacts of the proposed project on water demand and water quality are not cumulatively considerable.

1.10.4 NOISE

1.10.4.1 Environmental Impacts

1.10.4.1.1 Construction

Construction noise is generally site-specific and localized to the vicinity of each related project. Construction of some of the cumulative projects that are near the proposed project could occur concurrently. The proposed increase in noise associated with the proposed project construction activities are expected to increase from 0.1 to 0.9 dBA depending on the location of the sensitive receptor (residential areas) and the time of day. The increase in noise would be less than the significance threshold of 3.0 dBA and less than significant. The Wilmington/Carson area in the vicinity of the proposed project contains a number of heavy industrial facilities, as well as transportation corridors that generate noise. Accordingly, because construction noise impacts are substantially less than the 3.0 dBA significance threshold, noise levels decrease with distance, and the cumulative projects are not expected to contribute to significant adverse cumulative construction noise impacts, and are not expected to overlap with noise in the immediate vicinity of the Refinery, construction noise impacts from the proposed project are not considered to be cumulatively considerable and, therefore, do not contribute to significant adverse cumulative construction noise impacts.

1.10.4.1.2 Operations

Operational noise is generally site-specific, and localized to the vicinity of each related project. Although a project's operations could affect the noise environment in its immediate vicinity, the cumulative projects are not expected to have a significant cumulative impact on ambient noise due to the distance between the projects.

The operational noise impacts associated with the proposed project modifications were determined to be less than significant. Equipment and activities related to the proposed project would increase overall CNEL sound levels by up to 0.1 dBA at the nearest residences, which shows that noise levels from the refinery equipment subsides quickly with distance from the Refinery. Operational noise is generally site-specific, and localized to the vicinity of each related project. Although a project's operations could affect the noise environment in its immediate vicinity, the cumulative projects are not expected to contribute to significant adverse cumulative noise impacts during operation due to the distance between the projects. Because operational noise impacts are substantially less than the 3.0 dBA noise significance threshold, noise impacts from the proposed project are not considered to be cumulatively considerable and do not contribute to significant adverse cumulative noise impacts during operation.

1.10.4.2 Mitigation Measures and Cumulative Impacts

Mitigation is not required because the noise impacts of the proposed project are less than significant. No significant adverse cumulative noise impacts during operation are expected.

1.10.5 SOLID AND HAZARDOUS WASTE

1.10.5.1 Environmental Impacts

1.10.5.1.1 Construction

Solid Waste: The proposed project includes the demolition and removal of two existing storage tanks and affected existing piping at the Wilmington Operations. The tanks and piping are constructed of steel and are expected to be recycled. The concrete foundations that support the existing tanks would generate an estimated 265 cubic yards that would be transported off-site for crushing and recycling or disposal at inert or municipal landfills.

The proposed project has the potential to generate up to 206,953 cubic yards of non-hazardous construction soil waste, which can be disposed of in Class III landfills. The total remaining permitted Class III landfill capacity in southern California is estimated to be approximately 129.2 million tons (about 2,584 million cubic yards). Landfills in southern California have the capacity to accept the solid waste produced during the construction phase of the proposed project on a one-time basis. Therefore, because the proposed project's solid waste impacts during construction activities are less than significant, they are not considered to be cumulatively considerable and are not considered to contribute to significant adverse cumulative solid waste impacts.

Hazardous Waste: An estimated 83,213 cubic yards of soil from the proposed project may be considered hazardous waste. Tesoro would consider the type and extent of contamination and explore the variety of options available for disposal and remediation, which could include in situ, on-site, and off-site treatment (e.g., incineration, soil vapor extraction, bioremediation). In the event that the material still requires disposal (i.e., cannot be treated/remediated), the Kettleman Hills facility has sufficient available capacity (5,000,000 cubic yards) and the Clean Harbors Buttonwillow facility has available capacity (over 8,000,000 cubic yards) to accept the total amount of estimated one-time contaminated soil waste generated by construction activities associated with the proposed project. The proposed project impacts on solid/hazardous waste are not considered to be cumulatively considerable and are not considered to contribute to cumulative solid/hazardous waste impacts.

1.10.5.1.2 Operations

Solid Waste: The discussion of potential solid waste impacts from the proposed project in Section 4.6.3 indicated that the average annual amounts of solid waste are not expected to change because there would be no change in the number of refinery workers and refinery units do not typically generated solid waste. Therefore, solid waste impacts from the proposed project during operations are not considered to be cumulatively considerable and do not contribute to significant adverse solid waste impacts during operation.

Hazardous Waste: The proposed project will result in an increase in spent catalyst associated with the operation of the SARP and spent caustic associated with operation of the Wet Jet Treater and SARP. Both of these waste streams are expected to be recycled and, therefore, would not impact solid or hazardous waste landfill facilities. The operation of the proposed project may generate solid or hazardous waste streams, but those waste streams are expected to be reused or recycled into the DCUs. The operation of the proposed project is not expected to require additional waste disposal capacity and is not expected to interfere or undermine the Tesoro Refinery's ability to comply with existing federal, state, and local regulations for solid and hazardous waste handling and disposal. Therefore, the proposed project impacts on hazardous waste during operations are not considered to be cumulatively considerable and are not considered to contribute to significant adverse cumulative hazardous waste impacts.

1.10.5.2 Mitigation Measures and Cumulative Impacts

Mitigation is not required because the solid/hazardous waste impacts of the proposed project are less than significant. No significant adverse cumulative solid/hazardous waste impacts are expected.

1.10.6 TRANSPORTATION AND TRAFFIC

1.10.6.1 Environmental Impacts

1.10.6.1.1 Construction

The LOS at all intersections during the proposed project construction activities is expected to be LOS A, B or C at all intersections, except Wilmington Avenue/Interstate 405 SB Ramps during the morning peak hour. The construction-related trips are forecast to result in a significant impact during construction conditions at the Wilmington Avenue/Interstate 405 SB Ramps, as this intersection is currently under construction. Once the construction activities at the Wilmington Aveenue/Interstate 405 interchange itself are complete, traffic impacts due to construction of the proposed project would be less than significant. The proposed project assumes the interchange is under construction concurrently with construction of the proposed project, which results in significant impacts and mitigation measure TT-1 has been imposed.

Therefore, the proposed project traffic impacts during construction activities are mitigated to less than significant, are not cumulatively considerable, and are not considered to contribute to significant adverse cumulative traffic impacts during construction.

1.10.6.1.2 Operations

The proposed project operations would not increase the number of on-site workers after the construction phase, however approximately ~~nine~~ten additional truck round-trips per peak work day would result from the proposed project to support its operations. The cumulative impacts of the proposed project and related projects have been estimated in the traffic analysis (see Section 4.7 and Appendix E for further details). In year 2021, assuming a 0.4 percent growth in traffic, no intersections in the traffic study would operate below LOS C. Therefore, the proposed project operational traffic impacts, along with other related projects, are not cumulatively considerable and are not considered to contribute to cumulative significant adverse traffic impacts during operation of the proposed project.

1.10.6.2 Mitigation Measures and Cumulative Impacts

Mitigation measure TT-1 is required in order to reduce the proposed project's construction-related trips on the Wilmington Avenue/Interstate 405 SB Ramps intersection prior to the completion of the Interstate 405/Wilmington Avenue Interchange Project. TT-1 requires the applicant to implement a traffic management plan that requires project workers to avoid the Wilmington Avenue/Interstate 405 SB Ramps intersection during morning peak travel periods (while that onramp is under construction) by traveling either outside of the morning peak travel time or along alternative routes. The impacts of the proposed project on traffic and circulation are expected to be less than significant following implementation of mitigation measure TT-1. Therefore, construction traffic impacts from the proposed project are not cumulatively considerable and would not contribute to significant adverse cumulative construction traffic impacts.

1.11 EXECUTIVE SUMMARY CHAPTER 6: ALTERNATIVES ANALYSIS

1.11.1 ENVIRONMENTAL IMPACTS OF ALTERNATIVES

Alternatives evaluated in the EIR included: Alternative 1 – No Project Alternative; Alternative 2 – Fluid Feed Hydrodesulfurization Fractionator at Carson Operations and a New Diesel Hydrotreater at Wilmington Operations; Alternative 3 – New Carson Hydrotreater at Carson Operations; Alternative 4 – Interconnecting Pipeline and New Gasoline Hydrotreater at Carson Operations; and Alternative 5 – Alternative Construction Schedule.

1.11.1.1 Alternative 1 – No Project Alternative

The No Project Alternative would not result in further integration of the Wilmington and Carson Operations. Under the No Project Alternative, modifications to the Wilmington Operations would not move forward including modifications to the HCU, CRU-3, HTU-1, HTU-2, HTU-4, DCU Heater H-100, and crude tanks. The new PSTU, and SARP also would not be constructed and the Wilmington Operations FCCU would not be shut down. Modifications to the Carson Operations would also not occur including modifications to No. 51 Vacuum Unit, HCU, LHU, NHDS Unit, Naphtha Isomerization Unit, Alkylation Unit, Mid-Barrel Distillate Treater. The new Wet Jet Treater and six new crude tanks at the Carson Operations would not be installed. Interconnecting pipelines, electrical connections and modifications to the LPG Rail Car Unloading facilities would also not occur.

The No Project Alternative would continue the operation of the Wilmington and Carson Operations under their current configurations and it would not achieve any of the proposed project objectives such as: (1) improving the efficiency of the Refinery, allowing the shutdown of the Wilmington FCCU; (2) reducing overall emissions from the Refinery, including GHG emissions; (3) recovering and upgrading distillate range materials from FCCU feeds; (4) complying with federal, state, and local regulations; (5) improving the financial viability of the Refinery; better integration of the Carson and Wilmington Operations; and (6) improving the efficiency of water-borne crude oil receipt and marine vessel unloading. Not only would Alternative 1 not achieve any of the proposed project objectives, but because portions of Alternative 1 do not include the regulatory compliance projects, it may not be considered a feasible alternative as Tesoro would be in violation of regulatory mandates if not implemented.

Although Alternative 1 would eliminate all the significant and less than significant impacts that would occur under the proposed project, the locally beneficial impacts of the proposed project would also be eliminated. The Wilmington FCCU would not be shut down because none of the refinery modifications needed for that to occur would be implemented. Finally, the beneficial aspects of the proposed project associated with reduced annual ship emissions due to the increased crude offloading rate (see Table 4.2-9 and 4.2-11) would also be eliminated. Similarly, the overall reduction in wastewater generated during operation of the proposed project (over 79,000 gpd reduced) (see Table 4.4-2) would not occur. Consequently, Alternative 1 would continue current operational emissions, which would be substantially higher for most pollutants than operational emissions under the proposed project as the local emission reduction benefits associated with the proposed project would not be achieved (see Table 6.4-2).

1.11.1.2 Alternative 2 – Fluid Feed Hydrodesulfurization Fractionator at Carson Operations and a New Diesel Hydrotreater at Wilmington Operations

Alternative 2 includes installing one new Fractionator at the tail end of the Carson Operations Fluid Feed Hydrodesulfurization (FFHDS) Unit and one new Diesel Hydrotreater at Wilmington Operations to achieve the project objective of recovering and upgrading distillate range material from FCCU feed. The new FFHDS Fractionator and Diesel Hydrotreater would be constructed instead of making modifications to the Wilmington Operations HCU and HTU-4, and No. 51 Vacuum Unit and HCU at the Carson Operations. Under Alternative 2, the remainder of the proposed project components would remain unchanged, including the shutdown of the FCCU at the Wilmington Operations.

Alternative 2 would result in significant adverse impacts to air quality during construction and hazards during operation and would require the construction of two new refinery units (FFHDS Fractionator and Diesel Hydrotreater). Construction of the new Refinery units would potentially result in higher air quality, water quality, and hazard impacts than the proposed project. Alternative 2 would not reduce any of the potentially significant proposed project impacts to less than significant.

Alternative 2 would achieve most of the objectives of the proposed project, including: (1) improving the efficiency of the Refinery, allowing the shutdown of the Wilmington FCCU; (2) reducing overall emissions from the Refinery, including GHG emissions; (3) recovering and upgrading distillate range materials from FCCU feeds; (4) complying with federal, state, and local regulations; (5) improving the financial viability of the Refinery; (6) better integration of the Carson and Wilmington Operations; and (7) improving the efficiency of water-borne crude oil receipt and marine vessel unloading. However, Alternative 2 would not achieve the objectives of reducing overall emissions from the Refinery as a whole, as would the proposed project.

1.11.1.3 Alternative 3 – New Hydrotreater at Carson Operations

Alternative 3 would include the installation of one new Gasoline Hydrotreater at Carson Operations as an option to achieve the project objective of meeting U.S. EPA Tier 3 gasoline specifications of 10 ppm average sulfur content. Under Alternative 3, the new Gasoline Hydrotreater/SHU would be built instead of making modifications to HTU-1 and HTU-2 at the Wilmington Operations and LHU, NHDS Unit, and the Mid-Barrel Treater at the Carson Operations. The remainder of the project components would remain unchanged, including the shutdown of the FCCU at the Wilmington Operations.

Alternative 3 would result in significant impacts to air quality during construction and would result in greater operational GHG and criteria pollutant emissions associated with the two new heaters as compared to the proposed project. In addition, Alternative 3 also would result in significant adverse hazard impacts during operation. Alternative 3 would have greater impacts than the proposed project on operational air quality and wastewater impacts and it would not reduce any of the potentially significant adverse impacts of the proposed project to less than significant.

Alternative 3 would achieve most of the objectives of the proposed project, including: (1) improving the efficiency of the Refinery, allowing the shutdown of the Wilmington FCCU; (2) reducing overall emissions from the Refinery, including GHG emissions; (3) recovering and upgrading distillate range materials from FCCU feeds; (4) complying with federal, state, and local regulations; (5) better integration of the Carson and Wilmington Operations; and (6) improving the efficiency of water-borne crude oil receipt and marine vessel unloading. Alternative 3 would require the installation of two new heaters, which means that this alternative would not achieve as effectively as the proposed project the objective of reducing overall emissions from the Refinery as a whole, including GHG emissions.

1.11.1.4 Alternative 4 – Interconnecting Pipeline and New Gasoline Hydrotreater at Carson Operations

Alternative 4 would include the installation of the Interconnecting Pipeline and one new Gasoline Hydrotreater/SHU at Carson Operations as an option to achieve the project objective of meeting U.S. EPA Tier 3 gasoline specifications of 10 ppm average sulfur content. Alternative 4 would eliminate all of the other proposed project components and the Wilmington Operations FCCU would remain operational.

Alternative 4 would result in significant impacts to air quality during construction and hazards during operation; however, the impacts are expected to be less than the proposed project. Alternative 4 would eliminate the significant VOC construction air quality impacts and most of the hazard impacts. NOx emissions associated with the construction phase would remain significant under Alternative 4. The hazard impacts associated with the Interconnecting Pipelines would remain significant under Alternative 4; however, Alternative 4 would eliminate the potentially significant hazards associated with Naphtha Isomerization Unit, new crude tanks, and SARP. Alternative 4 would have greater impacts than the proposed project on operational air quality and wastewater impacts as the FCCU would not be shut down under Alternative 4 and it would not reduce any of the potentially significant adverse impacts of the proposed project to less than significant.

Alternative 4 would not accomplish the major objectives of the proposed project. Alternative 4 would meet the objective of better integration of the Carson and Wilmington Operations by constructing the Interconnecting Pipeline and complying with federal, state, and local regulations. However, Alternative 4 would not meet any of the other objectives of the proposed project including: (1) improving the efficiency of the Refinery, allowing the shutdown of the Wilmington FCCU; (2) reducing overall emissions from the Refinery, including GHG emissions; (3) recovering and upgrading distillate range materials from FCCU feeds; and (4) improving the efficiency of water-borne crude oil receipt and marine vessel unloading. The beneficial aspects of the proposed project associated with reduced ship emissions due to the increased crude offloading rate (see Table 4.2-9 and 4.2-11) would also be eliminated. Consequently, Alternative 4 would result in increased operational emissions over the proposed project as the local emissions benefits associated with the proposed project would not be achieved.

1.11.1.5 Alternative 5 – Alternative Construction Schedule

Alternative 5 includes a modified construction schedule (compare Figure 6.3-1 with Figure 2-18) so that construction of the proposed project components does not overlap as much as they do under the proposed project. Construction of a number of units would be delayed to later in the proposed project schedule. These units include the LPG Rail Unloading facilities, Naphtha HDS Unit, Mid-Barrel Treater, and HTU-1 and HTU-2 modifications. The shutdown of the Wilmington Operations FCCU would also be delayed another four years.

Alternative 5 would ultimately result in the same impacts as the proposed project in the areas of hazards, hydrology and water quality, noise, traffic and transportation, and solid and hazardous waste. Alternative 5 would reduce the peak construction emission impacts associated with the proposed project, but the construction emission impacts associated with NOx would remain significant. In addition, under Alternative 5 the Wilmington Operations FCCU would be shut down in 2021 instead of 2017, resulting in four additional years of operating the FCCU, which means that emissions from the FCCU would be unchanged from 2017 through 2021 and emissions would be substantially greater than what they would be under the proposed project. Alternative 5 would ultimately result in the same hazard impacts as the proposed project as all project components would be included in Alternative 5. Therefore, hazard impacts would remain significant. After all components of the proposed project are completed in 2021, Alternative 5 would have the same potentially less than significant and significant adverse environmental impacts as the proposed project.

Alternative 5 would achieve most the objectives of the proposed project, although there would be an approximately five-year delay in achieving some of the objectives, which would include: (1) improving the efficiency of the Refinery, allowing the shutdown of the Wilmington FCCU; (2) reducing overall emissions from the Refinery, including GHG emissions; (3) recovering and upgrading distillate range materials from FCCU feeds; (4) better integration of the Carson and Wilmington Operations; and (5) improving the efficiency of water-borne crude oil receipt and marine vessel unloading. Alternative 5 would not achieve the objective of improving the efficiency and enabling the shutdown of the Wilmington Operations FCCU by 2017. It would also delay a significant amount of local emission reductions, resulting in an additional five years of operation at increased emission rates. Under Alternative 5, it is assumed that the project components that would allow for the compliance with the U.S. EPA Tier 3 gasoline sulfur requirements would occur prior to 2017 so this objective would be achieved.

1.11.2 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA requires identification of the environmentally superior alternative in an EIR. There is no set methodology for comparing the alternatives or determining the environmentally superior alternative under CEQA. Therefore, the number of significant adverse impacts for each of the proposed project and alternatives are compared. The alternative with the least number of significant unavoidable impacts is considered the Environmentally Superior Alternative.

The proposed project and Alternatives 2 through 5 would result in significant adverse impacts on two environmental resource areas (air quality during construction and operational hazard impacts). Alternative 1, the No Project Alternative would eliminate all adverse significant impacts making it the environmentally superior alternative. But none of the project objectives will be achieved, including improving local air quality by shutting down the Wilmington Operations FCCU.

Alternatives 2 and 3 would likely result in equivalent or more significant environmental impacts than the proposed project as additional new Refinery units would be constructed. However, under Alternatives 2 and 3 the Wilmington Operations FCCU would be shutdown, which is expected to provide air emission, GHG, and waste water reductions. Both alternatives would also improve the efficiency of water-borne crude oil receipt and marine vessel unloading reducing the time it takes for marine vessels to unloading and reducing overall marine vessel emissions. After the No Project Alternative, Alternatives 2 and 3 would be the environmental superior alternatives.

The proposed project is preferred because it would most effectively attain all project objectives. None of the project alternatives would eliminate the potentially significant adverse construction air quality and hazard impacts, except Alternative 1, No Project Alternative. Alternative 3 would be similar in operational impacts to the proposed project and have less construction impacts, but would not eliminate significant project impacts or achieve all the project objectives.

1.12 EXECUTIVE SUMMARY – CHAPTER 7, 8, AND 9: REFERENCES, ACRONYMS AND GLOSSARY

Information on references cited (including organizations and persons consulted) and the acronyms and glossary are presented in Chapters 7 and 8, respectively. Chapter 9 contains a glossary of technical terms used in the EIR.

TABLE 1.9-1

Summary of Environmental Impacts, Mitigation Measures and Residual Impacts

Impact	Mitigation Measures	Residual Impacts
	Air Quality	
The construction phase of the proposed project will exceed the regional significance thresholds for VOC and NOx.	A-1 Maintain a Construction Management Program, A-2 Prohibit vehicles from idling in excess of five minutes, A-3 All on-road heavy duty diesel trucks or equipment with a GVWR of 19,500 pounds or greater shall comply with EPA 2007 on-road emission standards, A-4 Prohibit construction equipment from idling longer than five minutes, A-5 Utilize electric welders in areas served by electricity. Electric power tools shall be used in areas when feasible and available. A-6 Utilize on-site power where available instead of temporary generators, A-7 For off-road equipment rated at greater than 50 hp, the project proponent shall use equipment that meets Tier 4 emission standards, A-8 Suspend all construction activities that generate air pollutant emissions during first stage smog alerts, and A-9 Tesoro will implement early SCR catalyst change-outs as specified in Table 4.2-14 to improve NOx reductions.	Construction emissions for VOC~~, CO,~~ and NOx are expected to remain significant following mitigation.

TABLE 1.9-1 (Continued)

Impact	Mitigation Measures	Residual Impacts
The construction emissions of CO, SOx, PM10 and PM2.5 will not exceed SCAQMD CEQA regional significant thresholds and are less than significant.	None required.	Construction emissions of CO, SOx, PM10, and PM2.5 are expected to remain less than significant following mitigation.
Construction impacts for NO_2 would exceed applicable localized significance thresholds.	See Mitigation Measures A-1 thru A-9 summarized above.	Concentrations of NO_2 from construction activities are expected to cause a significant impact to applicable localized significance thresholds and no additional mitigation has been identified that would reduce the localized air quality impacts during construction. Construction impacts for CO, PM10, and PM2.5 would be less than significant.
Operational emissions of CO, VOC, NOx, SOx, PM10 and PM2.5 are less than significant.	None required. Project emissions are controlled through BACT and emission offsets.	The proposed project is expected to result in a reduction in mass daily emissions of CO from stationary sources providing beneficial air quality impacts. VOC, NOx, SOx, PM10 and PM2.5 emission increases would be less than significant.
Ambient air quality modeling indicates that the project operational emissions of NO_2, CO, PM10, and PM2.5 will be less than the applicable localized significance threshold and are less than significant.	None required.	Project emissions of NO_2, CO, PM10, and PM2.5 associated with the operation of the proposed project will be less than the applicable localized significance thresholds and are less than significant.
The cancer risk due to the operation of the proposed project is expected to be less than the significance threshold of 10 per million, so that project impacts are less than significant.	None required.	Cancer risk impacts are less than significant.

TABLE 1.9-1 (Continued)

Impact	Mitigation Measures	Residual Impacts
The proposed project's impacts associated with exposure to non-carcinogenic TACs are expected to be less the chronic hazard index and the acute hazard index significance threshold of 1.0.	None required.	Non-carcinogenic health impacts are less than significant.
Hazards and Hazardous Materials		
During construction, hazards and hazardous material impacts generated by excavation activities are expected to be less than significant.	None required.	Construction related hazards and hazardous material impacts are expected to be less than significant.
Hazard impacts of the proposed project during operation associated with the Naphtha Isomerization Unit, new crude tanks, SARP, and Interconnecting Pipelines are expected to be significant.	HHM-1 Prior to the commencement of operations associated with new and modified project components, the applicant shall demonstrate to the Los Angeles City and County Fire Departments compliance with applicable hazardous material rules and regulations, to include, at minimum, an Emergency Action Plan as required by the Fire Department addressing spill, fire, and explosion hazards and relative risk of upset to adjacent land uses.	Hazards and hazardous material impacts generated by the proposed project are expected to remain significant after mitigation.
Hydrology and Water Quality		
Water demand during construction is limited to water applied for dust suppression and water needed to perform hydrostatic testing of new tanks and pipelines, and is expected to be less than significant.	None required.	Construction water demand impacts are less than significant.

TABLE 1.9-1 (Continued)

Impact	Mitigation Measures	Residual Impacts
The existing water supply can meet the water demand of the proposed project of 191,275 gpd and the daily water demand associated with operation of the proposed project is less than the significance threshold of 262,820 gpd.	None required.	Operational water demand impacts are less than significant.
Wastewater from construction of the proposed project is expected to be discharged in compliance with the existing IWDPs for the Refinery. Therefore, no water quality impacts are expected.	None required.	Construction wastewater impacts are less than significant.
Once operational, the proposed project would result in an overall reduction in wastewater of over 79,000 gpd, primarily due to the shutdown of the Wilmington Operations FCCU.	None required.	Operational wastewater impacts are less than significant.
Noise		
Construction activities would result in noise increases from 0.1 to 0.9 dBA which is less than the significance threshold of 3.0 dBA.	None required.	Construction noise impacts are less than significant.
Operational noise increases at all receptor locations are predicted to be a maximum of 0.1 dBA which is less than the 3.0 dBA significance threshold. Therefore, noise impacts associated with the operation of the proposed project would be less than significant.	None required.	Operational noise impacts are less than significant.

TABLE 1.9-1 (Concluded)

Impact	Mitigation Measures	Residual Impacts
Vibration impacts during construction and operational activities were evaluated and predicted to be less than the Federal Transit Administration vibration impact threshold.	None required.	Vibration impacts associated with construction and operational equipment are less than significant.
	Solid and Hazardous Waste	
No significant solid or hazardous waste impacts associated with construction activities are expected as local landfills can handle the one-time receipt of solid or hazardous waste from construction.	None required.	Solid and hazardous waste impacts associated with construction activities are less than significant.
The operation of the proposed project may generate solid or hazardous waste streams, which are expected to be reused or recycled. No significant solid and hazardous waste impacts are expected.	None required.	Solid and hazardous waste impacts associated with operation of the proposed project are less than significant.
	Transportation and Traffic	
Construction-related trips are forecast to result in a significant impact during construction conditions at the Wilmington Ave/Interstate 405 SB Ramps under their pre-construction configuration.	TT-1 Requires the Refinery to implement a traffic management plan to address project traffic impacts at the Wilmington Avenue/Interstate 405 Southbound Ramps intersection.	Construction traffic impacts are less than significant after mitigation.

CHAPTER 2

PROJECT DESCRIPTION

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2.0 PROJECT DESCRIPTION

2.1 INTRODUCTION

Tesoro is proposing the Los Angeles Refinery Integration and Compliance Project. In June 2013, Tesoro purchased the adjacent BP Carson Refinery, which, as part of the proposed project will be more fully integrated with the Tesoro Los Angeles Refinery – Wilmington Operations to form the Tesoro Los Angeles Refinery. The Refinery includes: (1) the Wilmington Operations located at 2101 East Pacific Coast Highway in the Wilmington District of the City of Los Angeles; and (2) the Carson Operations, which is the former BP Carson Refinery located at 2350 East 223rd Street in the City of Carson. The proposed project will be designed to better integrate the Wilmington Operations and Carson Operations.

As a matter of course, federal and state agencies typically review mergers and acquisitions of a certain size prior to closing to ensure compliance with antitrust statutes. On May 17, 2013, the Federal Trade Commission and the California Attorney General's office each announced that they had concluded a nine month investigation and had resolved any potential antitrust concerns with Tesoro Corporation's proposed acquisition of BP's southern California refining and marketing assets, including BP's Carson Refinery near Los Angeles.

The Attorney General explained that the investigation involved close cooperation with the California Energy Commission and that, "over the course of the investigation, the agencies and various third parties combined to produce millions of pages of documents and voluminous amounts of data." The agencies "reviewed these documents and data, subpoenaed the parties and numerous third parties for testimony, and secured a leading economist in the field of oil and gas to conduct various analyses of the markets at issue." After a thorough investigation and review of the evidence, many of the agencies' concerns were addressed, and they concluded that any remaining consumer, environmental and job security issues were appropriately addressed through a letter agreement with Tesoro, stating "… we believe that these commitments will help ensure that California's oil and gas markets remain competitive for years to come, help to reduce greenhouse gases and emissions, and protect jobs for potentially thousands of Californians." (California Attorney General, 2013)

In its statement, the Federal Trade Commission said it concluded from the qualitative and quantitative evidence that "the proposed acquisition is not likely to lessen competition substantially in violation of Section 7 of the Clayton Act or Section 5 of the FTC Act. … Although the specific facts associated with this transaction do not warrant Commission action at this time, the Commission is fully committed to using all the tools at its disposal to protect competition and consumers in this important economic sector." (Federal Trade Commission, 2013)

Currently, there are some pipeline connections between the Wilmington and Carson Operations that allow limited transfer of crude oil, feedstocks, and refined products between the two Operations. The proposed project would greatly enhance the integration of overall Refinery operations through process modifications that enable shutting down the Fluid Catalytic Cracking

Unit (FCCU) at the Wilmington Operations and relying on the remaining Carson Operations FCCU for production of FCCU gasoline at both Operations, installation of new pipeline connections between the Wilmington and Carson Operations, and the installation of transmission lines from the Carson Operations Watson Cogeneration (Cogen) Facility to Wilmington Operations. The new pipeline connections will allow efficient transfer of intermediate feedstocks between the facilities to allow gasoline blending optimization, gas oil balancing and maintaining transportation fuels production capability. The installation of new electricity transmission lines will allow electricity generated at the Carson Operations to be used at the Wilmington Operations. These electricity transmission lines will allow the increased electricity demand from the proposed project to be supplied entirely from existing on-site electricity generation.

In addition to furthering Refinery integration, the proposed project will be designed to comply with the federally mandated Tier 3 gasoline specifications and with State and local regulations mandating emission reductions. Federal Tier 3 gasoline specifications require that refining companies meet an annual average of 10 ppm sulfur in gasoline produced from their refineries in the United States by January 1, 2017. The Los Angeles Refinery Integration and Compliance Project is designed to meet Tier 3 gasoline sulfur standards and is expected to substantially reduce GHG, SOx, NOx, and CO emissions. These emission reductions will be accomplished by recovering diesel and jet boiling range materials from the gas oil that is currently fed to both Wilmington and Carson Operations FCCUs so that the remaining gas oil feed from the Wilmington Operation FCCU can be diverted to the Carson Operations FCCU, while maintaining the same overall level of transportation fuels production. Reconfiguring the combined Refinery complex is expected to improve the gasoline to distillate production ratio from the integrated Refinery and to allow more expeditious response and adjustments to ongoing changes in market demand for various types of petroleum products. Additionally, heat recovery will be optimized by installing new heat exchangers and modifying specified units to further minimize GHG and other emissions. All new and modified sources will be required to comply with Best Available Control Technology (BACT) requirements in SCAQMD Rule 1303. The proposed process modifications will improve efficiency, enabling Tesoro to shut down the Wilmington Operations FCCU and reduce carbon intensity per unit volume of product output.

The proposed project will have a small impact on crude oil and feedstock throughput capacity. The crude oil and feedstock processing capability at the integrated Refinery will increase approximately two percent or 6,000 barrels per day (bbl/day) as a result of the proposed project. In spite of this increase in feedstock throughput capacity, the proposed project is still expected to result in overall Refinery emission reductions. Further, the modifications will be designed so that the combined Refinery operates within the existing capacity of the Sulfur Recovery Plants (SRPs), so no SRP permit modifications are required. The type of crude oil and feedstocks will not change as part of the proposed project. Crude oil and oil feedstocks are currently obtained from a variety of sources based on factors such as product availability and market conditions. Feedstocks include, but are not limited to: intermediate gas oil, transmix (a mixture of pipeline products; such as gasoline, jet and diesel) and internally recycled oil. Modifications will be made to recover diesel and jet fuel boiling point range material, also known as distillate, from gas oil that is currently fed to the FCCUs at both Wilmington and Carson Operations. In addition, facilities will be added to remove impurities such as sulfur, nitrogen compounds, and organic acids from distillates. There will be no modifications at any of the marine terminals associated with the Tesoro Los Angeles Refinery.

On April 23, 2014, the SCAQMD released a Notice of Intent to adopt a Draft Negative Declaration for the Tesoro Storage Tank Replacement and Modification project. The Tank Replacement and Modification Project was considered to be a separate project from the Tesoro Refinery Integration and Compliance Project because it could go forward with or without the currently proposed project; that is, neither project relies on the other project to be implemented and each project has independent utility. However, because of the timing of construction and implementation of the two projects, it was decided to incorporate the Tesoro Storage Tank Replacement and Modification project into the currently proposed project to provide a cohesive analysis of all environmental impacts from the two projects. As a result, the Negative Declaration for the Tesoro Storage Tank Replacement and Modification project has been withdrawn and the impacts are analyzed as part of the currently proposed project (see Subsection 2.7.1.9).

2.2 PROJECT OBJECTIVES

Tesoro is proposing the Los Angeles Refinery Integration and Compliance Project to further integrate its Los Angeles Refinery Carson and Wilmington Operations. Because the Carson and Wilmington Operations are located adjacent to each other, there are opportunities for reducing emissions and improving operational efficiencies at and between the two sites if they can be more fully integrated.

There are multiple objectives for the proposed project that include the following:

- Improving process efficiency through integration while maintaining the overall production capability of transportation fuels. Making process modifications that improve efficiency and enable shutdown of the Wilmington Operations FCCU prior to the next scheduled FCCU turnaround, currently anticipated to occur in 2017, providing substantial emission reductions on-site and reducing carbon intensity.

- Recovering and upgrading distillate range material from FCCU feeds. Tesoro proposes to achieve this objective by modifying 51 Vacuum Unit, and the Hydrocracker Unit (HCU) at Carson Operations, and the Hydrotreater Unit 4 (HTU-4) and HCU modifications at Wilmington Operations. Recovering distillate from FCCU feed enables shut down of the Wilmington Operations FCCU since the Carson Operations FCCU has sufficient capacity to process the FCCU feed that remains after distillate recovery.

- Complying with federal, state, and local rules and regulations. Tesoro proposes to achieve this objective by: (1) meeting the U.S. EPA Tier 3 gasoline specifications; and (2) reducing Refinery NOx, SOx, and GHG emissions through proposed process modifications that improve efficiency, enable shutdown of the Wilmington Operations FCCU, and lower carbon intensity.

- Improving financial viability for the newly integrated Tesoro Los Angeles Refinery and the local community. Tesoro proposes to achieve this objective by: (1) reducing future operating, capital, turnaround, and environmental compliance costs, primarily by shutting down the Wilmington Operations FCCU; (2) improving electrical supply reliability; (3) improving integrated Refinery transportation fuel production flexibility between gasoline and distillate products to respond to changes in market demand, including the capability to produce 100 percent of the refinery gasoline production as CARB compliant gasoline; and (4) providing sustainable local jobs and tax revenue for the community.

- Integrating Carson and Wilmington Operations. Tesoro proposes to achieve this objective by installing the Interconnecting Pipelines to allow efficient transfer of hydrocarbons between the facilities to allow gasoline blending optimization, process unit feedstock optimization, and increased diesel production.

- Increasing overall Refinery processing efficiency. Tesoro proposes to achieve this objective by: (1) adding a Sulfuric Acid Regeneration Plant at the Wilmington Operations to regenerate sulfuric acid on-site; (2) adding a Wet Jet Treater to improve jet fuel quality; (3) upgrading and adding facilities to recover and treat propane for commercial sales; and (4) upgrading existing LPG rail facilities to enable fast unloading of railcars.

- Improving efficiency of water-borne crude oil receipt and marine vessel unloading. Unloading crude oil from marine vessels without delay will reduce vessel emissions at the Port of Long Beach. Tesoro proposes to achieve this objective by constructing six new 500,000 barrel tanks at the Carson Crude Terminal and replacing two existing 80,000 barrel crude oil tanks at the Wilmington Operations with two 300,000 barrel tanks. Piping within the Carson Crude Terminal will be installed to connect the six new 500,000 barrel tanks to existing pipelines to the Carson Operations and Marine Terminal 1. The two new 300,000 barrel tanks will be connected to existing pipelines from the Wilmington Long Beach Terminal. Within the confines of the Wilmington Operations, the existing 12-inch diameter piping will be replaced with 24-inch diameter piping to connect the replacement tanks to the Wilmington Operations.

2.3 PROJECT LOCATION

The proposed project will occur at both the Wilmington and Carson Operations of the Tesoro Los Angeles Refinery. Tesoro will more fully integrate the recently purchased adjacent BP Carson Refinery (referred to as the Carson Operations) with the existing Wilmington Operations, to become a more efficient single entity owned and operated by Tesoro. The Refinery will be comprised of approximately 950 contiguous acres in size and operate within the Cities of Los Angeles (Wilmington District) and Carson, California.

The Wilmington Operations are located within Wilmington, a community under the jurisdiction of the City of Los Angeles, at 2101 East Pacific Coast Highway, Wilmington, Los Angeles County, California 90744. The Carson Operations are located at 2350 East 223rd Street, Carson, California, 90810. Although the SRP is considered to be a portion of the Wilmington

Operations, it is located at 23208 South Alameda Street in the City of Carson. Figure 2-1 depicts the regional location of the Refinery and Figure 2-2 provides a detailed Site Location Map. The proposed project would include installing pipelines within the Refinery as well as under Alameda Street and Sepulveda Boulevard adjacent to the Refinery to connect pipelines between the Wilmington and Carson Operations. Both new and modified equipment, as well as connecting pipelines, will be located within portions of the Refinery under both the City of Carson jurisdiction and the City of Los Angeles jurisdiction.

2.4 LAND USE AND ZONING

Implementation of the proposed project at the Wilmington and Carson Operations of the Tesoro Los Angeles Refinery will occur primarily within existing property boundaries. Land uses in the vicinity of the Refinery include oil production facilities, refineries, hydrogen plants, coke handling facilities, automobile wrecking/dismantling facilities, and other industrial operations.

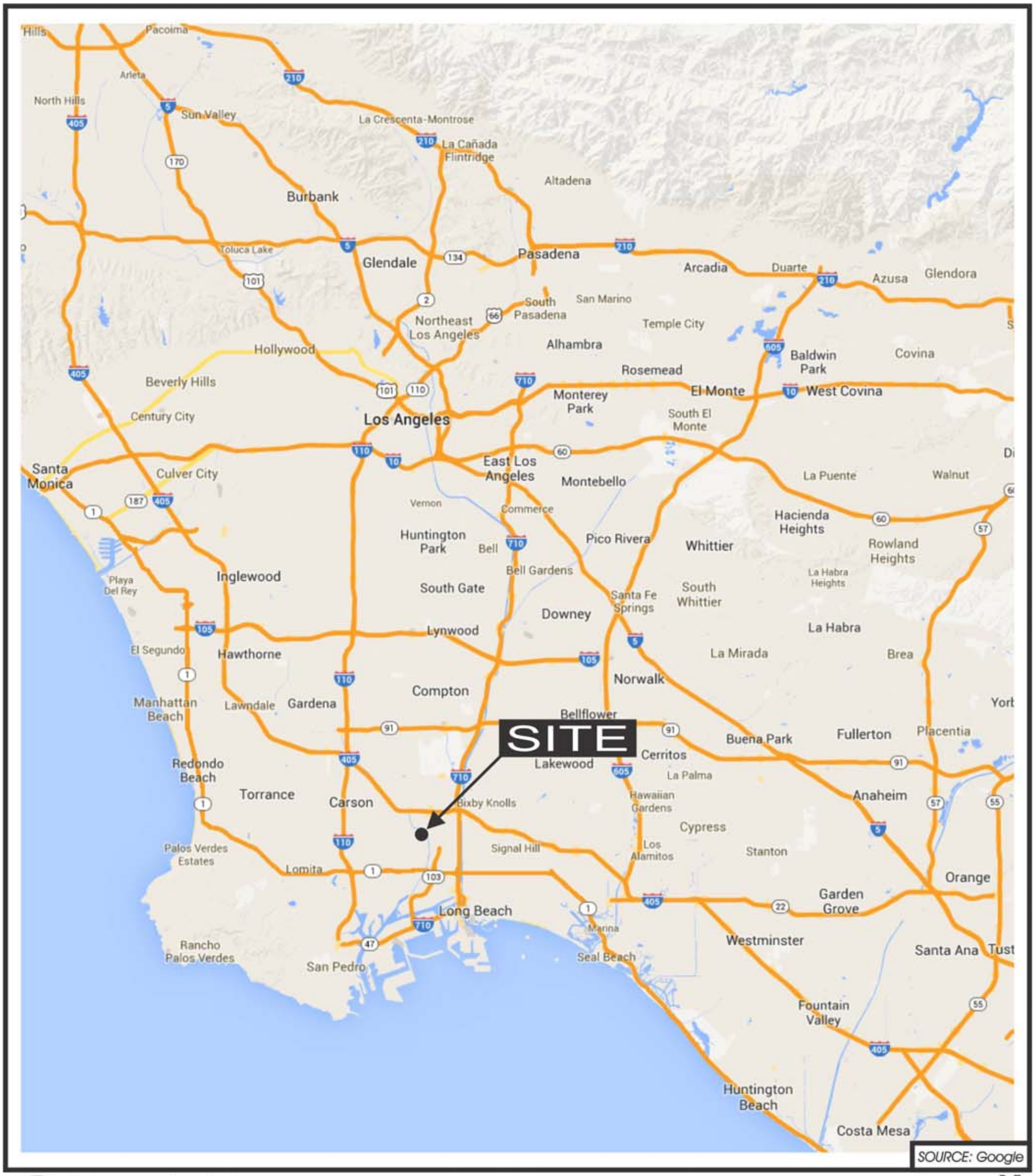
2.4.1 WILMINGTON OPERATIONS

The Wilmington Operations are bounded to the north by Sepulveda Boulevard (as well as other tank farms and refinery activities), to the west by Alameda Street (as well as the Alameda Corridor and other tank farms), to the south by railroad tracks (as well as tank farms and metal recycling/scrap yards), and to the east by the Dominguez Channel (as well as other tank farms and rail yard activities) (see Figure 2-2). The Wilmington Operations are bisected by Pacific Coast Highway, with the larger portion of the Wilmington Operations to the north of Pacific Coast Highway and the smaller portion to the south. The closest residential area to the Wilmington Operations is about 200 feet west of the Truck Loading Rack (see Figure 2-2).

The main operating portions of the Wilmington Operations are located within the Wilmington-Harbor City Planning Area (City of Los Angeles), which permits heavy industrial uses including petroleum refining on the Tesoro property (City of Los Angeles, 1999). The Wilmington-Harbor City Plan places no additional restrictions on refineries, and specifically allows for construction without regard to height limitations. The Refinery and all adjacent areas are zoned for heavy industrial use (M3-1).

2.4.2 CARSON OPERATIONS

The Carson Operations are bounded by Wilmington Avenue to the west, 223rd Avenue to the north, Alameda Street and the Dominguez Channel to the east, and Sepulveda Boulevard to the south. The Dominguez Channel flows through the Carson Operations, dividing the property into two sections: Northeastern and Southern. Several industrial/commercial facilities and the 405 Freeway border the Carson Operations to the north. The Alameda Corridor, a major port access arterial, and other industrial facilities, including the Carson Operations Coke Barn, the Air Products Hydrogen Plant, the Wilmington Operations SRP, wrecking yards, and the ICTF are located to the east of the Refinery. Land to the east of the ICTF is in the City of Long Beach and includes a residential neighborhood and light manufacturing facilities.



Environmental Audit, Inc.

FIGURE 2-1
REGIONAL MAP
TESORO LOS ANGELES REFINERY

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Project No. 2844

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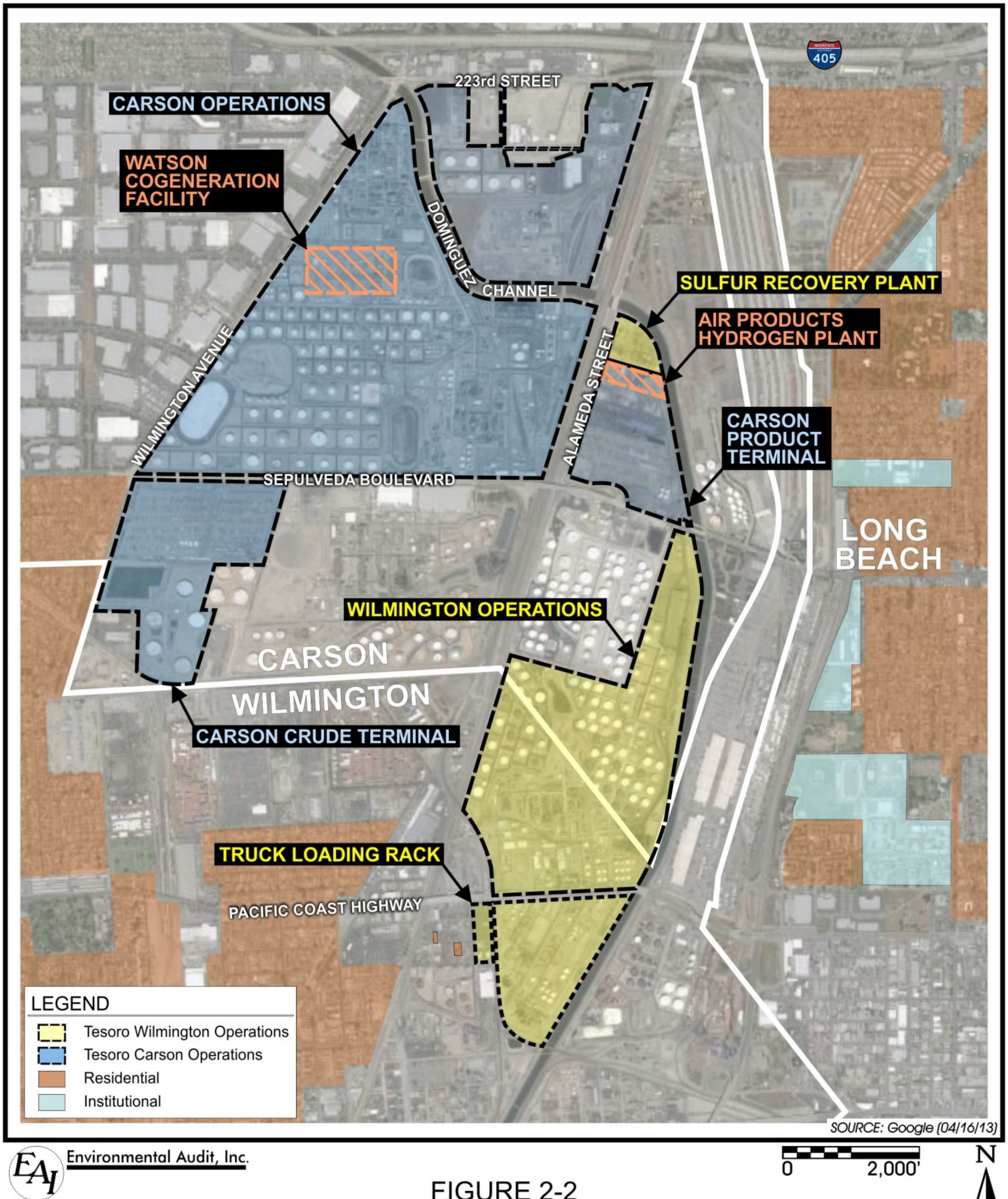

FIGURE 2-2
SITE LOCATION MAP
TESORO LOS ANGELES REFINERY

Project No. 2844

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To the west of the Carson Operations is Wilmington Avenue. The land adjacent to Wilmington Avenue on the west is occupied by the Watson Industrial Park, a development of manufacturing and warehouse-type structures. The land to the west of Wilmington Avenue and south of Sepulveda Boulevard, immediately west of Carson Operation's southwest tank farm, known as the Carson Crude Terminal, is a residential neighborhood and represents the closest residences (about 100 feet from the Carson Crude Terminal property boundary and 1,300 feet from the proposed crude oil tanks location). South of the Carson Operations is Sepulveda Boulevard and the ConocoPhillips Carson Plant and a cold storage warehouse facility. This area is dominated by storage tanks, refinery equipment and a large warehouse.

The Carson Operations and all adjacent facilities and properties are zoned MH according to the City of Carson's Land Use element of its General Plan. The closest residential area to the Carson Operations is approximately 250 feet southwest of the Refinery on the southwest corner of the Sepulveda Boulevard/Wilmington Avenue intersection (approximately 4,500 feet from proposed project modifications).

As noted previously, the SRP is part of the Wilmington Operations, but is located in the City of Carson. The SRP is zoned MH according to the City of Carson's Land Use element of its General Plan. Adjacent land uses to the SRP also are heavy industrial and include other refineries, a hydrogen plant, undeveloped lots, and container storage areas.

2.5 OVERVIEW OF PETROLEUM REFINING

Crude oil is a mixture of hydrocarbon compounds and relatively small amounts of other materials, such as oxygen, nitrogen, sulfur, salt, sediment, and water. Petroleum refining is a coordinated arrangement of manufacturing processes designed to produce physical and chemical changes in the crude oil to remove most of the non-hydrocarbon substances, break the crude oil into its various components, and blend them into various useful products. The overall refining process uses four kinds of techniques: 1) separation, including distilling hydrocarbon liquids into gases, gasoline, diesel fuel, fuel oil, gas oils, and heavier residual materials; 2) cracking or breaking large hydrocarbon molecules into smaller ones by thermal or catalytic processes; 3) reforming using heat and catalysts to rearrange the chemical structure of a particular oil stream to improve its quality; and, 4) chemically combining two or more hydrocarbons to produce high-grade gasoline.

Crude oil is delivered to the Wilmington and Carson Operations via pipeline from ships at the Marine Terminal and other local pipelines. Crude oil is processed in the Crude Unit where it is heated and distilled into various hydrocarbon components, which are further processed in downstream processing units. The Refinery also receives and transports other refined petroleum products (crude oil not included) to and from the Refinery by ship, truck, and railcar. The Wilmington and Carson Operations produce a variety of products including unleaded gasoline, jet fuel, diesel fuel, petroleum gases, petroleum coke, and sulfur. Elemental sulfur and petroleum coke are produced as by-products of the refining process. Major processing units at the Refinery include the Crude Unit, DCU, hydrotreating units, reforming units, FCCU, Alkylation Unit, Hydrogen Plant, SRP, and the Cogeneration Plants.

Refining processes convert crude oil into petroleum products, which have varying market values. Refineries strive to optimize the volumes or "yields" of higher value products, such as transportation fuels (i.e., gasoline, diesel, and jet fuel) while producing the maximum quantity of saleable products from each barrel of crude oil refined. Each type of crude oil produces different yields of products (ICCT, 2011).

2.5.1 TYPES OF CRUDE OIL

Crude oils are comprised of thousands of different chemical compounds. The majority of these compounds are hydrocarbons, consisting solely of hydrogen (H) and carbon (C) atoms. Crude oils also contain other compounds including small amounts of sulfur, nitrogen, oxygen, and metals.

Hydrocarbons are measured by the number of carbon atoms present in each molecule. Crude oil contains hydrocarbons and other compounds with up to 50 carbon atoms or more (ICCT, 2011). The weight of hydrocarbons increases as the number of carbons increase. The lightest hydrocarbons, for example, are petroleum gases such as methane (CH_4), ethane (C_2H_6), propane (C_3H_8), and butane (C_4H_{10}), where each molecule of these gases contains one to four carbon atoms, respectively. Gasoline is a mixture of heavier hydrocarbon, with anywhere from five to 12 carbon atoms in each molecule.

The different crude oils produced throughout the world vary in weight (i.e., the proportion of light to heavy hydrocarbons), the predominant hydrocarbon type (e.g., paraffins, naphthenes, and aromatics (see Chapter 8 for definitions)), and the amount of other compounds (e.g., sulfur) (Lucas, 2000). Of these, weight and sulfur content are commonly used to describe crude oils. The weight of crude oil is compared to water using an American Petroleum Institute (API) method referred to as API Gravity (Leffler, 2008). Most crude oils have API Gravities between 10 and 70 degrees with lighter crude oils having higher values. (Schlumberger, 2015)

The sulfur content of crude oil generally ranges anywhere from 0.0 to 3.5 percent (Energy Information Association (EIA), 2015). While not definitively set, crude oils with a sulfur content of less than 0.5 percent are known as "sweet" crude oils and crude oils with a sulfur content greater than one percent are known as "sour" crude oils (ICCT, 2011). Crude oils are generally categorized as follows in Table 2.5-1.

Refinery configurations, operating characteristics, and economics are unique to each location. Crude oil selection is based first and foremost on limitations of refinery configuration, and on oil characteristics which optimize production of desired products. Refineries blend crude oil in order to enable operations within the process unit limitations. If a crude oil cannot be blended to meet the crude property limitations of a specific refinery, it will not be purchased. Selection of crude oil blends is made considering the capabilities of all the refinery units, the quality and price of crude oil that is available, the market demand and price of specific products and product specifications (Lucas, 2000).

TABLE 2.5-1

Crude Oil Classes

Crude Oil Class	Property Range	
	Gravity (°API)	Sulfur (wt. %)
Light Sweet	35-60	0-0.5
Light Sour	35-60	>0.5
Medium Medium Sour	26-35	0-1.1
Medium Sour	26-35	>1.1
Heavy Sweet	10-26	0-1.1
Heavy Sour	10-26	>1.1

SOURCE: International Council on Clean Transportation (ICCT), 2011

The crude oils available in the marketplace at any given time provide a wide range of API gravities and sulfur content. Table 2.5-2 presents the spectrum of crude oils processed in the U.S. in 2011 (ICCT, 2013). Light, sweet crude oils are considered the highest quality and therefore are the most expensive (e.g., Brent or West Texas Intermediate). Heavy sour crude oils are the least expensive (e.g., Arab Heavy or Western Canadian Select) (EIA, 2015).

2.5.2 THE REFINING PROCESS

The first step in the refining process is to separate crude oil into components by taking advantage of the differing boiling points of the compounds contained in the crude oil using simple distillation in the crude unit. Compounds that boil within a certain boiling point range or cut point are considered fractions (Leffler, 2008). The lower the boiling point, the lighter the fraction, i.e., compounds that boil at less than 60 ^{o}F are the light gases fraction. Typically, heavy compounds boil between 500 and 1050 ^{o}F are the gas oil fraction. Common fractions include, from lightest to heaviest, light gases, naphthas, kerosene, distillate, gas oils, and residual oil. Different crude oils produce different percentages of the various fractions (see Figure 2-3). Figure 2-3 compares the fractions of a typical light crude oil (35° API) and a typical heavy crude oil (25° API) with the average demand profile for products in developed countries. As shown in Figure 2-3, both light and heavy crude oils produce more heavy oils than heavy oil products the market demands (shown in blue). Therefore, to produce the desired marketable products, additional processing besides simple distillation is needed. A simplified typical refinery process diagram is included in Figure 2-4 (ICCT, 2011).

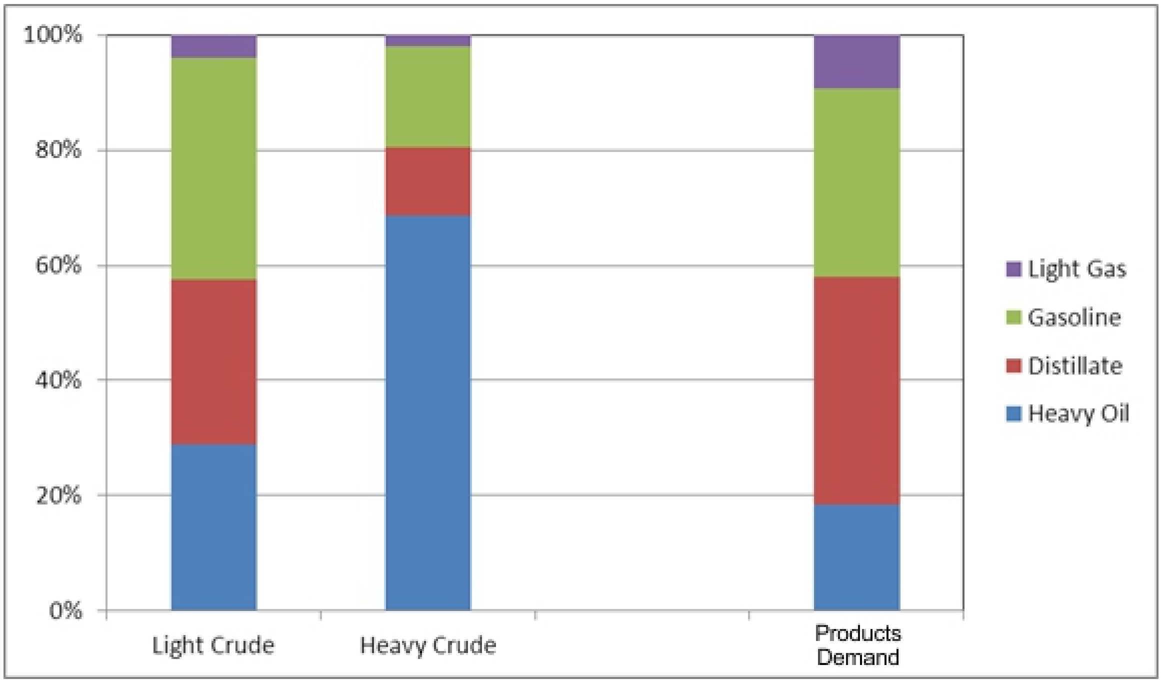
TABLE 2.5-2

U.S. Crude Oil Supply in 2011

Origin and Type of Crude Oil	Volume (1,000 bbl/day)[a]	API Gravity	Sulfur (wt %)
Domestic	5,897	35.0	0.72
Light, Tight Oil	187	47.0	0.11
Alaska	945	32.0	0.90
California	538	17.1	1.47
All Other	4,227	36.9	0.67
Canada	2,202	26.2	2.3
Conventional			
Light & Medium	588	36.1	0.73
Heavy	292	21.3	3.18
Oil Sands			
Light Synthetic	308	33.3	0.21
Heavy	1,014	20.3	3.52
Mexico	1,000	24.8	2.6
Light & Medium	247	37.4	1.05
Heavy	753	21.1	3.38
Atlantic Basin[b]	3,447	26.5	1.2
Light	975	39.9	0.15
Medium	561	30.8	0.32
Heavy	1,911	19.3	1.92
Rest of World	2,261	32.6	1.8
Light	332	39.2	0.65
Medium	1,866	31.9	2.09
Heavy	63	20.1	2.33

SOURCE: ICCT, 2013.
(a) 1,000 bbl/day = thousand barrels per day.
(b) Comprises Latin America, Caribbean, and West Africa, but excludes North Sea.

The crude unit is the "front end" of the refining process. After distillation in the crude unit, the resulting fractions or process streams are further refined and treated in various "process units" for blending into marketable products. To formulate products, some hydrocarbons in the crude oil need to be converted to different chemical compounds. Hydrocracking and fluid catalytic cracking units break or "crack" heavy fractions into lighter compounds. Other compounds require rearranging the molecular structure in units such as catalytic reformers, alkylation units, and isomerization units. Producing lighter fractions from heavier compounds allows a refinery to produce more high value products such as gasoline from heavier gas oils. Coking is a thermal cracking process used on the residual oil to convert the remaining heaviest compounds to lighter compounds (ICCT, 2011).

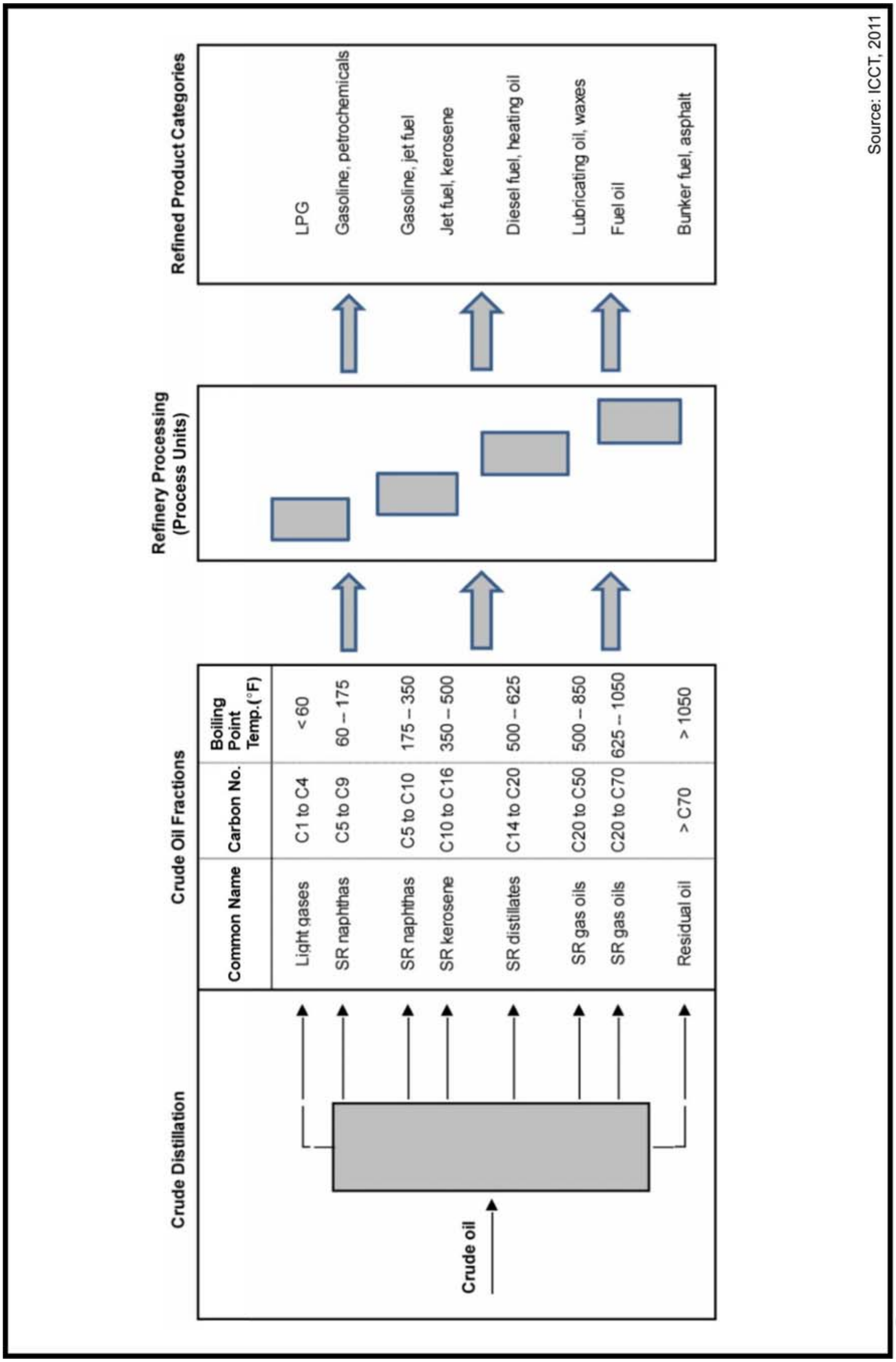


SOURCE: ICCT, 2011

FIGURE 2-3

TYPICAL NATURAL YIELDS OF LIGHT AND HEAVY CRUDE OIL

To meet product specifications, impurities in the crude oil, such as sulfur and nitrogen compounds and metals, must be removed. Hydrotreating units remove sulfur and nitrogen from process streams; sulfur in the form of hydrogen sulfide, and nitrogen in the form of ammonia, which are then converted into elemental sulfur and nitrogen in sulfur recovery units. Nitrogen, an inert gas, is emitted from the sulfur recovery unit. Metals remain in the residual oil that is fed to the Coker and is converted to coke. Elemental sulfur and coke are removed by the refining process as solid or molten liquid materials. Elemental sulfur and coke are products of refining with economic value that are sold and transported as a heated liquid known as molten sulfur and as solid coke.



Environmental Audit, Inc.

FIGURE 2-4
SIMPLIFIED DIAGRAM OF THE REFINING PROCESS

Project No. 2844
N:\2844\The Refining Process (rev.3).cdr

2.5.3 REFINERY OPTIMIZATION

The configuration of any refinery is unique, in terms of its overall capacity, the types of units employed, the technical capabilities, and the individual capacity of each unit (Lucas, 2000). The block flow diagram in Figure 2-5 reflects the complexity of a typical refinery. Several aspects of refining operations suggested by Figure 2-5 merit comment. Refineries produce dozens of refined products (ranging from very light, such as LPG, to very heavy, such as residual fuel oil). Operation of the various process units within their design limitations involves numerous decisions to optimize conversion of the selected crude oil blend into products. The operating parameters of the various process units in turn limit the properties of the crude oil blends that can be processed by a particular refinery configuration. These constraints include a limitation on the amount of crude oil that can be processed in any one day, the qualities of the crude oil blend that can be processed, and the combination of products that can be produced.

The complexity of refinery operations is such that they can be fully understood and optimized, in an economic sense, only through the use of refinery-wide mathematical models (ICCT, 2011). Because refinery operations are complex, virtually all refiners use the "linear programming" technique to plan refinery operations. The Linear Program model involves the use of a (proprietary) mathematical model to determine the most profitable or optimal operating strategy for a particular refinery. The model "inputs" include variables such as the configuration and constraints of the refinery in question, the crude oils available, market demand, product prices, and product specifications. The model "outputs" include the crude oils that should be purchased, the product slate that should be produced, the cut points, and the manner in which each intermediate process stream should be treated and blended.

2.5.4 THE TESORO LOS ANGELES REFINERY

The Tesoro Los Angeles Refinery consists of two adjacent operations: one in Carson (the Carson Operations) and the other in Wilmington (the Wilmington Operations) that are integrated to a degree. The Refinery receives its crude oil by pipeline and marine vessels and converts crude oil into finished products; including gasoline, jet fuel, diesel, LPG, petroleum coke, and sulfur. The Refinery produces CARB compliant gasoline and diesel used in California.

2.5.4.1 Crude Oil Processing

The Refinery consists of a variety of equipment, including: distillation columns, reactors, heaters, boilers, vessels, pumps, compressors, storage tanks and other ancillary equipment. Tesoro also operates Cogeneration Plants located within the Refinery property (Watson Cogen Facility at the Carson Operations and the Cogen Unit at the Wilmington Operations), and under separate permits, a Coke Calcining Plant in the Port of Long Beach, Marine Terminals within the Port of Long Beach and pipelines and other product distribution terminals within southern

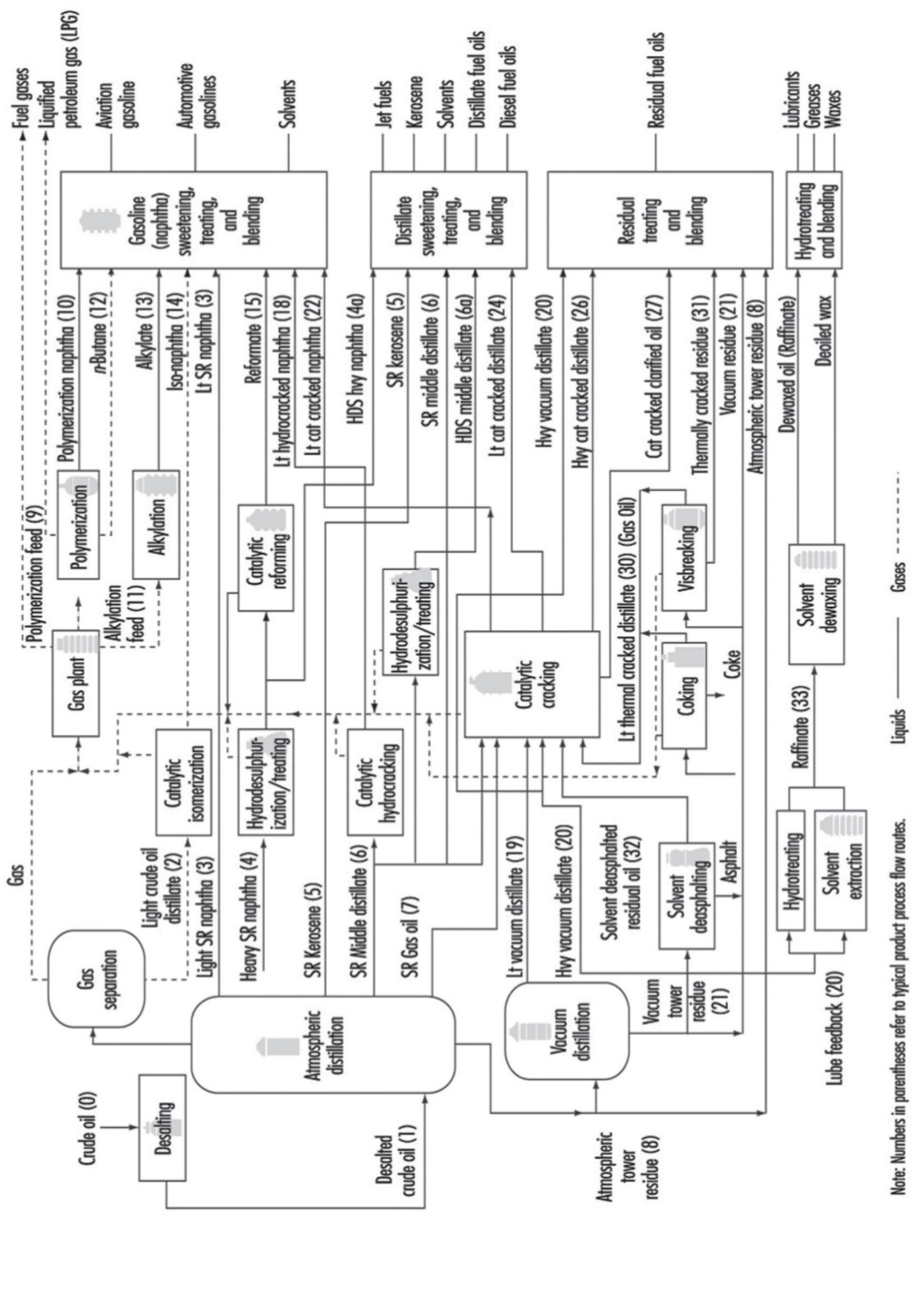


FIGURE 2-5
EXAMPLE OF TYPICAL REFINERY FLOW DIAGRAM

EAI Environmental Audit, Inc.

Project No. 2844
N:\2844\Typical Operations (rev.1).cdr

California. The Refinery receives crude oil, intermediate feedstocks, and blending components via pipelines; many deliveries are brought into southern California via marine vessels. Pipelines are used to export the majority of the Refinery products: gasoline, jet fuel, and diesel. The Refinery uses rail transport to export and import LPG using an SCAQMD-permitted LPG loading/unloading rack. The Refinery uses truck transport to export gasoline, diesel, petroleum coke, sulfur, and LPG using SCAQMD-permitted truck racks.

Crude oils delivered to the Refinery are transferred into storage tanks within the Refinery that are either floating roof tanks or fixed roof/blanketed tanks venting to vapor recovery systems as required by U.S. EPA and SCAQMD rules. Crude oils are pumped or gravity fed to the Refinery processing units. Intermediate feedstocks are pumped to other Refinery processing units for further treating including “cracking" and "reforming.”

The Los Angeles Refinery currently purchases crude oil from all over the world. Crude oil is selected through Linear Program modeling and based on its suitability for processing in the Refinery. There are limitations on the types of crude oil that can be processed in the Refinery due to the design limitations and capacities of the processing units. The crude oil characteristics considered include sulfur and nitrogen content, gravity (or density), organic acid content, total acid number (TAN), the content of metals and other impurities, and cost. In 2014, the Los Angeles Refinery processed over 30 different types of crude oil from various regions worldwide including North and South America, the Middle East, and Africa. Crude oil that is purchased is blended to meet criteria specific to Carson or Wilmington Operations. Crude oil blends are selected to complement specific refinery configurations. For example, the Carson Operations have been designed to run primarily Alaska North Slope (ANS) crude oil, which is no longer readily available. Therefore, the Carson Operations blend crude oils to have properties similar to ANS crude oil.

The basic crude oil operating envelope, or acceptable ranges of several properties, for the Carson Operations is an API gravity range of 28 degrees to 35 degrees and sulfur content of 0.6 to 3.5 weight percent sulfur. The basic crude oil operating envelope for the Wilmington Operations Crude Unit is an API gravity range of 19 degrees to 37 degrees and sulfur content of 0.0 to 2.5 weight percent sulfur. The feed operating envelope for the Delayed Coker Unit is an API gravity of 9 degrees to 23 degrees and sulfur content of 0.8 to 3.5 weight percent sulfur (the feed to the Delayed Coker is a blend of crude oils and resid from processing units).

The first major unit in which crude oil is processed is the Crude Unit that separates the crude oil into different fractions. The Carson and Wilmington Operations each have a Crude Unit, FCCU and a Hydrocracker Unit that process heavier streams and convert them to lighter hydrocarbon streams. Hydrotreaters and Sulfur Recovery Units remove sulfur from process streams and convert the removed sulfur into elemental sulfur. Delayed Coker Units at both sites convert residual oil into petroleum coke and lighter process streams. The Alkylation, Reforming, and Isomerization Units change the shape of the hydrocarbon molecules in the gasoline range streams that are blended into gasoline.

The total crude oil rate capacity for the Los Angeles Refinery is 363,000 bbl/day[2]. The crude oil rate for Wilmington Operations is primarily constrained by Crude Unit and Coker feed heater duty conditions described in the existing SCAQMD permit. Therefore, the Wilmington Operations is heat limited in its ability to process additional crude oil, which will be modified by the revision to the Heater H-100 permit. The Carson Operations crude rate is constrained by physical limitations of the equipment, including heater duty and pump/piping capacity limitations. In order to increase crude oil processing rate at Carson Operations, physical modifications to the heaters, pumps and piping would have to be made and the appropriate SCAQMD permits would need to be obtained. No such modifications are included as part of the proposed project.

The sulfur contained in crude oil that comes into the Refinery must also leave the Refinery, it cannot accumulate. There are limited possibilities for removing this sulfur from the Refinery. Most of the sulfur is removed in the form of elemental or liquid sulfur solution that has been recovered. Small amounts of sulfur remain in the refined products and coke that is produced and it can be emitted in the form of sulfur dioxide that is a by-product of burning small quantities of sulfur compounds in refinery fuel gas or sulfur plant tail gas. All of these removal outlets have limits defined by the following:

- The physical capacity of the sulfur plant and tail gas units;
- Regulatory sulfur limits on the refined products; and,
- Regulatory sulfur limits on the refinery fuel gas and sulfur plant tail gas. (Note: Refinery fuel gas is a blend of refinery gas used for fuel in refinery heaters and boilers and generated from the process units, LPG and natural gas. Sulfur plant tail gas is the residual gaseous effluent from the Claus sulfur recovery process that is further treated for sulfur removal in a tail gas treating unit and/or incinerator in order to meet stringent sulfur limits.)

Virtually all the sulfur that is contained in crude oil is removed from the Refinery via one of the above described outlets. Because there are strict regulatory limits or physical capacity limitations on downstream units, the range of sulfur in crude oil that can be processed by the Refinery is limited. The Refinery operates at or near these limits today, and there is limited capability for processing higher sulfur crude oil.

The gravity or heaviness of the crude oils that can be processed is set by equipment limits in the Crude Unit itself. There are limitations to how light or how heavy the crude oil slate can be for a given crude unit design.

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[2] The 380,000 bbl/day capacity of the Refinery as reported in the most recent Tesoro SEC 10K filing is based on the 2015 Solomon survey. The 380,000 bbl/day capacity does not reflect a physical modification of the Refinery, but was derived from an updated study after the NOP was issued (see Master Response 5 in Appendix G0 for further detail).

If either the Carson Operations or Wilmington Operations attempted to run a lighter crude oil slate, it would be restricted by hydraulic limits or “lift” in the Crude Unit. The design of the Crude Unit distillation columns or towers has a limit on its capacity to “lift” the lighter portion of the crude oil. If the limit is exceeded, there is a phenomenon known as “flooding” that occurs due to high vapor velocities inside the tower. When flooding occurs, the ability of the tower to separate components, which is the primary function of the tower, is dramatically compromised. The operating limits on the Refinery’s Crude towers are provided in Table 2.5-3.

TABLE 2.5-3

Tesoro Los Angeles Refinery Crude Unit Limitations

Unit	Tower Lift Limit (barrels per hour)	Comments
Carson No.1 Crude Unit	90,000	Carson has reached this limit when running light crude oils.
Carson No. 2 Crude Unit	37,000	No. 2 Crude Unit operates at its feed heater limit of 33,000 barrels per hour because the tower runs a heavier crude oil slate.
Carson No. 4 Crude Unit	20,000	Carson has reached this limit when running light crude oils.
Wilmington Crude Unit	16,000	Wilmington has reached this limit when running light crude oils.

Relieving these constraints would require modifications to the Crude tower internals, or replacement of the Crude towers themselves. If new Crude towers were to be installed, the entire overhead system of pipes, heat exchangers, accumulator vessels and naphtha pumps would also have to be replaced. Equipment modifications of this nature would require Tesoro to submit applications to modify the Refinery Title V operating permit with the SCAQMD. No such modifications to the Crude Unit are included as part of the proposed project.

If the Carson or Wilmington Operations were to run heavier crude oils, the amount of crude oil that could be processed at both Operations would be limited by the downstream Coker Units. The heavy material from the Crude/Vacuum process, called residuum or resid, leaves the Vacuum tower bottom and is fed to the Coker Unit. The Coker Unit is a semi batch process where the resid is heated and fed to coke drums. Some of the heated resid cracks and evolves lighter material while in the drum; the material that does not crack remains in the drum as coke. The drum eventually gets filled up with petroleum coke and the feed is diverted to a second drum. The first drum is cooled, depressured, emptied, and is then ready for the next cycle. The limit in the Coker Unit is a combination of the coke drum size and the cycle time. The “heaviness” of the crude oil the Refinery can process is set by the capacity of the Coker Unit. To run a heavier crude oil blend than is currently run at the Refinery either the Coker Unit cycle time would have to be reduced or new equipment (i.e. coke drums) would have to be built. As cycle time is reduced, resid feed rates must also be reduced, this results in a heaviness limit for the crude oil slate. The Carson Coker Unit (Cokers Nos. 1 and 2 combined) has achieved a peak capacity of approximately 67,230 bbl/day and currently operates near this rate on a peak day. The Wilmington Coker Unit has achieved a peak capacity of approximately 44,000 bbl/day and currently operates near this rate on a peak day. The 2012-2013 annual average rates through the Coker Units were 44,700 bbl/day for Carson Operations and 36,950 bbl/day for Wilmington Operations. There is a limit to the amount of coke that can be processed within the current cycle time. Both Carson and Wilmington Operations modifications to relieve these limits would require new larger coke drums. Equipment modifications of this nature would require Tesoro to submit applications to modify the Refinery Title V operating permit with the SCAQMD. No such modifications to the coke drums at the Coker Units are included as part of the proposed project.

The Coker Unit at Carson includes one train that produces fuel grade coke and another that produces anode grade coke. The limits on the fuel grade side include coke drum capacity and limits on the Coker Unit blowdown system. Relieving these constraints would involve building new coke drums and replacing air coolers, condensers and pressure relief devices. Equipment modifications of this nature would require Tesoro to submit applications to modify the Refinery Title V operating permit with the SCAQMD. No such modifications to the Coker Units are included as part of the proposed project.

As described above, Tesoro has a number of limitations on the sulfur content and API gravity on the crude oil blend that the Refinery can process. For example, a heavy Canadian crude oil, like Cold Lake, exceeds the sulfur content and API gravity of a crude oil that can be run at the Tesoro Los Angeles Refinery. Cold Lake crude oil contains approximately 3.7 percent (by weight) sulfur. In order to run Cold Lake crude oil, it must be blended with other crude oils. Further, Cold Lake crude oil has a high TAN. The Refinery would exceed metallurgy limits (i.e. exceed industry practice for acceptable corrosion rates) if it were to run too high a percentage of Cold Lake crude oil due to its high TAN. Thus, the Refinery is limited in how much heavy and sour crude oils, such as Cold Lake, can be used in the blend. The Refinery would continue to be subject to these same constraints if the proposed project is approved and implemented.

2.5.4.2 Crude Oil Feedstocks

Tesoro can choose from a variety of available crude oils within acceptable sulfur content and API gravity parameters at any given time for the Carson Operations and the Wilmington Operations. In the last several years, Tesoro has purchased a variety of crude oils ranging from light sweet to heavy sour. Tesoro's crude oil selection is guided by analysis performed utilizing a proprietary Refinery Linear Program model. The Linear Program model analysis takes into account many factors including the configuration of the Refinery, quality of the available crude oils that can be blended to complement the Refinery's configuration, prices for each crude oil, estimated demand and prices for specific products, and specifications of the products to be produced. Some of these factors are constantly changing, therefore Tesoro's crude oil and feedstock charge changes as well.

Figure 2-6 shows the optimal crude oil slates selected monthly by the Linear Program Model for 2012 – 2014 for the Wilmington Operations. Figure 2-7 shows the optimal crude oil slates selected monthly by the Linear Program Model for 2012 – 2014 for the Carson Operation. In selecting the monthly optimal crude oil slates, the Linear Program Model considers market forces, such as crude oil prices and availabilities, and processing constraints, such as unit turnarounds. There is also an economic balance that must be achieved. While certain heavier crude oils may be less expensive to purchase, they would produce more residuals, or low value coke, and less light, higher value products. As explained above, the Refinery is already operating the coker units at capacity.

Tesoro does not process all the crude oils individually as they are delivered to the Refinery. Based on the Refinery's unique configuration, Tesoro must blend different crude oils into a specific range of API gravity and sulfur content before they can be processed. Tesoro uses the proprietary Linear Program model to determine whether the crude oil can be processed by itself or blended with other available crude oil run. Ultimately, the Linear Program model will determine whether a crude oil can be processed individually or when blended with other available crudes. If a specific crude oil cannot be run by itself or within a blend, it will not be purchased.

2.5.4.3 Refinery Expert Independent Evaluation of the Proposed Project

The District retained refinery expert, Dr. Stephen McGovern, PE, to independently review the proposed project, including the crude oil processing capabilities of the refinery. Dr. McGovern provided an independent review of the information related to crude oil processing and verified the operating limitations described in Sections 2.5.4.1 and 2.5.4.2. The conclusions presented in Dr. McGovern's report are summarized as follows:

1. The LARIC project [proposed project] will not change the modes by which Tesoro receives crude oil into the refinery complex. As such, the LARIC project [proposed project] will not allow Tesoro to access crudes that are not currently available to the refinery. . . .

2. Certain aspects of the Tesoro Los Angeles Refinery's processing configuration limit the instantaneous quality of the crude mix that can be processed. These aspects of the refinery processing configuration will not be changed significantly by this project. . . .

3. Although some of the units in the Tesoro Los Angeles Refinery are being modified and new units are being added, the slate of crude oils available to the refinery will not change and the minor changes in average crude oil quality that might result would not cause an increase in operating emissions of criteria air pollutants, toxic air contaminants or GHG emissions after the mitigation methods that are part of the LARIC [proposed project] are applied.

4. The changes being made as a result of this project will not allow the refinery to process a different slate of crude oil. As such, there will be no crude oil changes that make the refinery more prone to upset or potential leaks of hazardous or toxic substances. . . .

The completed Dr. McGovern report is provided in Appendix F.

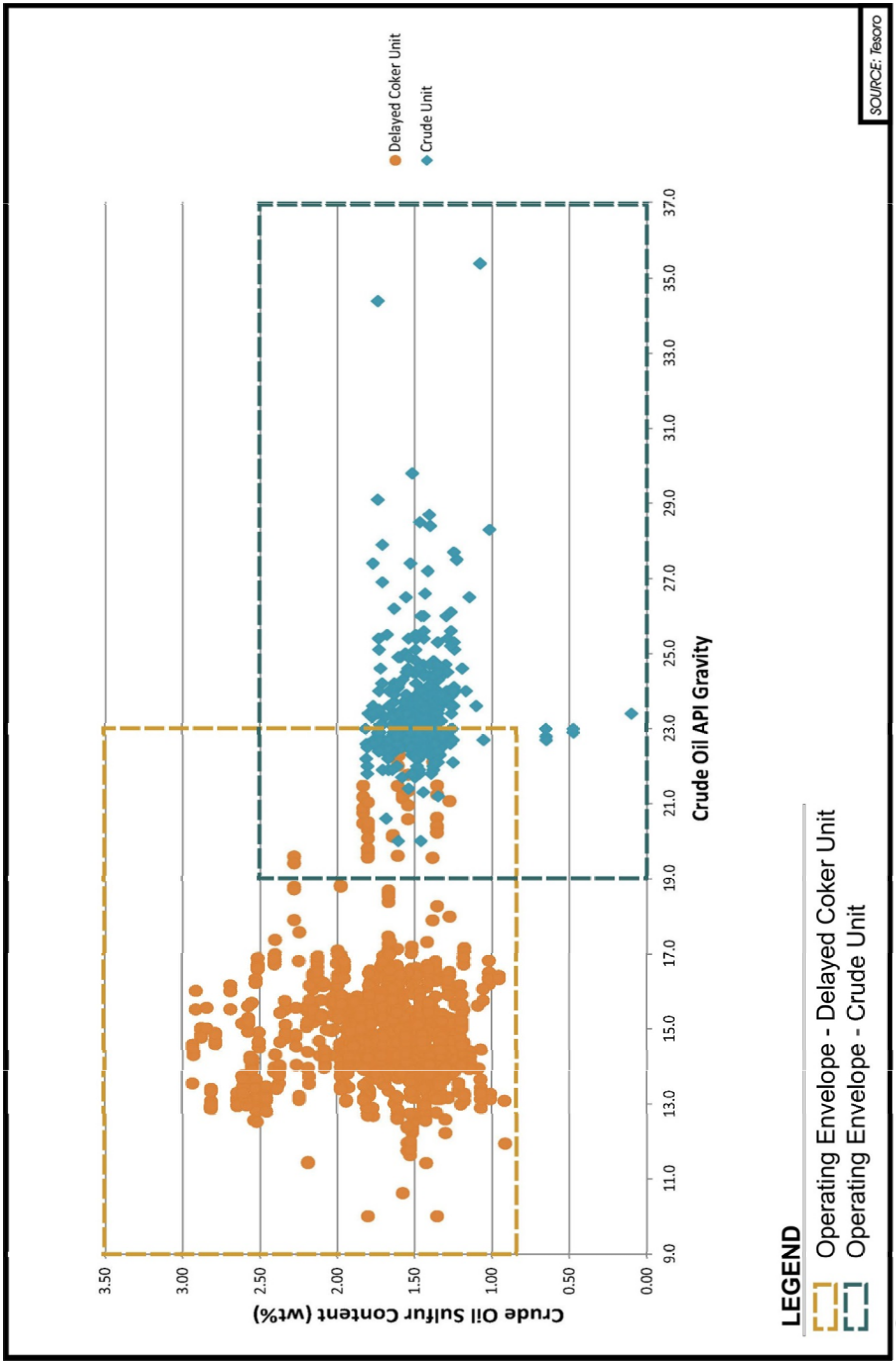
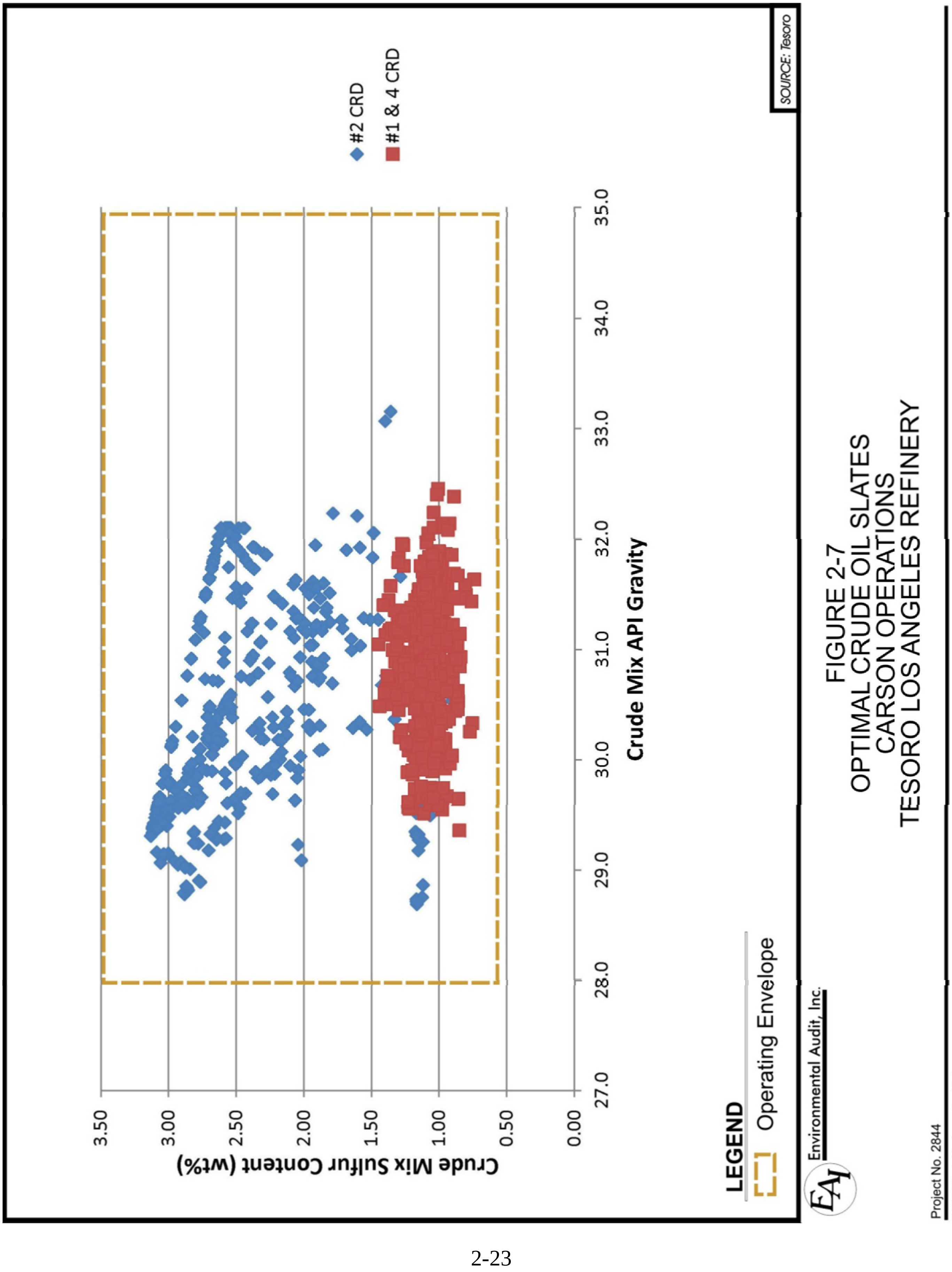


FIGURE 2-6
OPTIMAL CRUDE OIL SLATES
WILMINGTON OPERATIONS
TESORO LOS ANGELES REFINERY

Project No. 2844
N:\2844\Crude Mix Wilmington (rev.3).cdr


Crude Mix Sulfur Content (wt%)
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
27.0
28.0
29.0
30.0
31.0
32.0
33.0
34.0
35.0
Crude Mix API Gravity
#2 CRD
#1 & 4 CRD
LEGEND
Operating Envelope
SOURCE: Tesoro
Environmental Audit, Inc.
FIGURE 2-7
OPTIMAL CRUDE OIL SLATES
CARSON OPERATIONS
TESORO LOS ANGELES REFINERY
Project No. 2844
N:\2844\Crude Mix Carson (rev.2).cdr

2.6 TESORO REFINERY EXISTING OPERATIONS

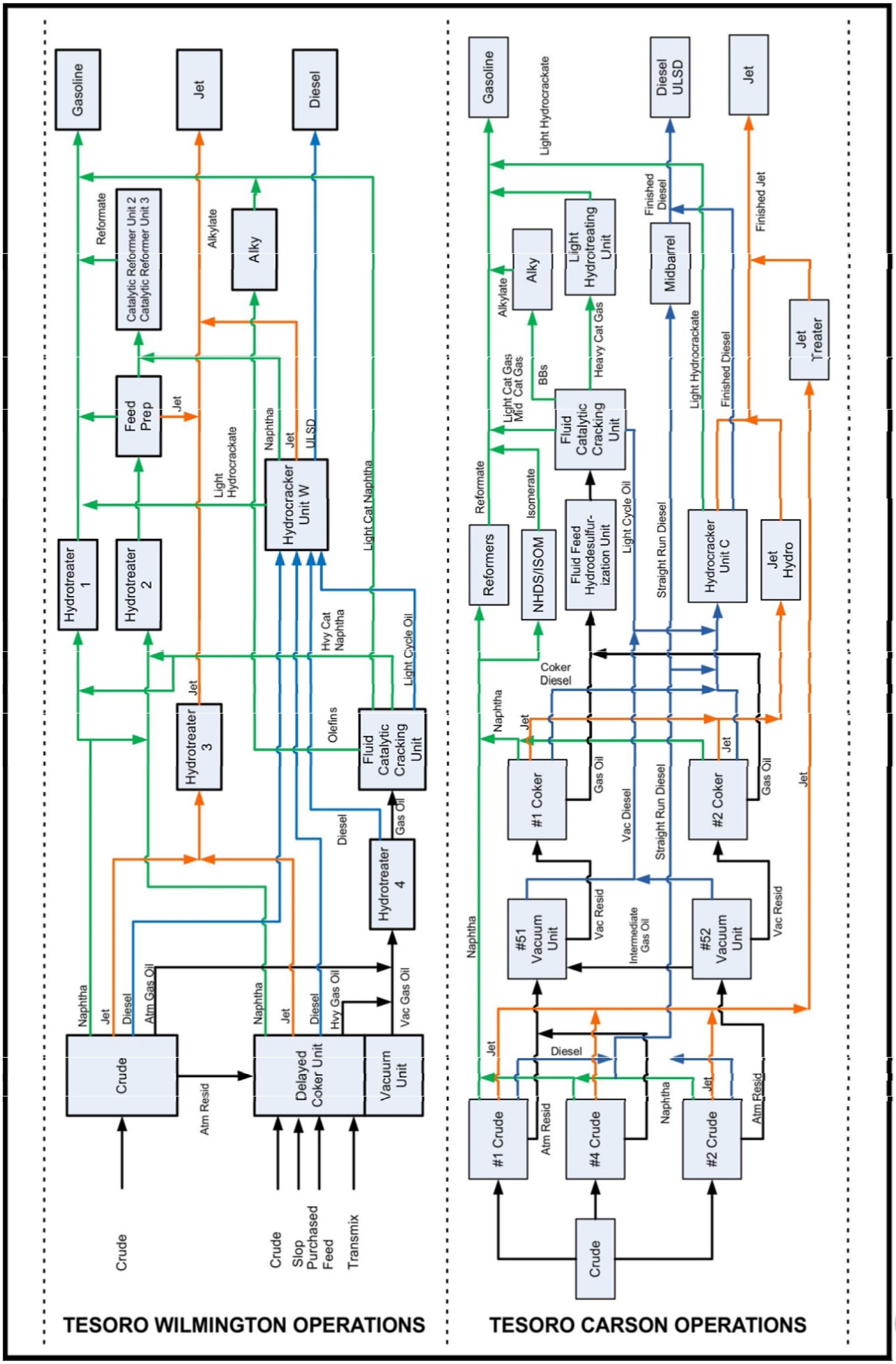
Currently, the Wilmington and Carson Operations function as two separate and distinct facilities with some limited integration. Figure 2-8 provides a simplified block flow diagram showing the major processing units for the existing Carson and Wilmington Operations.

2.6.1 WILMINGTON OPERATIONS

Petroleum operations began at the Wilmington Operations in 1923. Tesoro acquired the Wilmington Operations in 2007. Crude oil for the Wilmington Operations is delivered via ship using the pipeline from the Tesoro Marine Terminal at the Port of Long Beach Berths 84A and 86. Crude oil, including California crude oils, can also be delivered via pipeline from other onshore locations. No crude oil is transported to the Wilmington Operations via rail and there are no facilities to receive crude oil deliveries by railcar. The Wilmington Operations currently utilize 20 storage tanks to store crude oil and other heavy petroleum liquids (18 have a capacity of 80,000 bbl and two have a capacity of 125,000 bbl). Crude oil is processed in the Crude Unit where it is heated and distilled into various hydrocarbon components, which are further processed in downstream Wilmington Operations units. The Wilmington Operations also receive, process, and transport other refined petroleum products (crude oil not included) to and from the Wilmington Operations by ship, truck, and railcar. These petroleum products include residuum, gas oil, diesel, gasoline, naphtha, transmix, and LPG.

2.6.2 CARSON OPERATIONS

Petroleum operations began at the Carson Operations in 1923. Tesoro acquired the Refinery in 2013. Crude oil for Carson Operations is unloaded from tankers at Berth 121 or T-2 Terminals located in the Port of Long Beach and then transferred via pipeline and stored at Port of Long Beach Terminals or the Carson Crude Terminal. No crude oil is transported to the Carson Operations via rail and there are no facilities to receive crude oil deliveries by railcar. Crude oil is sent via pipeline from the marine terminals to Carson Operations for further storage in any of nine Refinery crude oil storage tanks and then processed in the Crude Units. Crude oil, including California crude oil, can also be delivered via pipeline from other onshore locations. The Carson Operations storage tanks that store crude oil range from 80,000 to 460,000 bbl capacity. The crude oil from the Carson Operations storage tanks is then transferred to the Crude Units. Crude oil is processed in Crude Units #1, #2 and #4 where it is heated and distilled into various hydrocarbon components which are further processed in downstream Carson Operations units. The Carson Operations also receive, process, and transport other refined petroleum products (crude oil not included) to and from the Carson Operations by ship, truck, and railcar. These petroleum products include residuum, gas oil, diesel, gasoline, naphtha, and LPG. Additionally, the Carson Operations have the Watson Cogen Facility that currently produces excess power, beyond the Carson Operations' needs, and sells the excess power to Southern California Edison. The Coke Calcining Plant is not involved in the proposed project.



Environmental Audit, Inc.

FIGURE 2-8
EXISTING BLOCK FLOW DIAGRAM
TESORO LOS ANGELES REFINERY

Project No. 2844
N:\2844\Block Flow Diagrams\Existing Block Flow (rev.6).cdr

2.6.3 TESORO LOS ANGELES REFINERY

The Tesoro Los Angeles Refinery consists of two adjacent facilities, Carson Operations and Wilmington Operations, that are managed as one Refinery. The Carson and Wilmington Operations have in the past and continue to produce a variety of products including unleaded gasoline, jet fuel, diesel fuel, fuel oil, petroleum gases, petroleum coke and sulfur. The Carson Operations also produces high purity propylene, used as feedstock to the adjacent Ineos Polypropylene Plant, and calcined coke. Elemental sulfur and petroleum coke are produced as by-products of the refining process at both the Carson and Wilmington Operations. Major processing units at both the Carson and Wilmington Operations include the Crude Units, the Vacuum Units, the Delayed Coker Units, hydrotreating units, reforming units, the FCCUs, the Alkylation Unit, hydrogen plants, the Sulfur Recovery Plants, and the Cogeneration Plants. The major differences between the Carson and Wilmington Operations are that the Carson Operations is a larger operation with three crude, two vacuum, and two coker units whereas the Wilmington Operations only has one crude, one vacuum, and one coker unit.

2.6.4 CURRENT LOS ANGELES REFINERY INTEGRATION

Currently Carson and Wilmington Operations are connected via Tesoro and third party pipelines that enable the transfer of a limited amount of intermediate and finished products between the two facilities. The Refinery optimizes crude oil and other refinery feedstock processing to produce the mixture of refined products that are marketed from the Tesoro Los Angeles Refinery. Unit turnarounds are aligned between the Carson and Wilmington Operations to minimize economic and local area impacts from process unit shutdowns and reduced production during turnarounds. For example, if Carson Operations is planning a major crude, vacuum, coker unit turnaround, the plan would ensure that Wilmington Operations does not plan a turnaround of those same units simultaneously. Hydrogen use is balanced and managed across the Los Angeles Refinery for hydrotreating purposes and output of clean fuel products. Crude oil, intermediate feedstocks and products are transferred between Carson and Wilmington Operations via pipeline, as necessary, to optimize Refinery production to meet market demand. The staffs of the Carson and Wilmington Operations have been merged and contractors' staff has been integrated to serve the combined operations.

2.6.5 MARINE TERMINALS ASSOCIATED WITH LOS ANGELES REFINERY

The Refinery receives crude oil from ships which unload at three marine terminals operated by Tesoro Logistics Operations, LLC (Tesoro Logistics) in the Port of Long Beach (POLB). The crude oil unloaded at the marine terminals is then piped to the Refinery for processing. The three marine oil terminals are: Marine Terminal 2 (T2) located at 1300 Pier B Street and includes Berths 76-78; the Long Beach Terminal, located at 820 Carrack Avenue and includes Berths 84-87; and Berth 121 (also known as Marine Terminal 1) located at 620 Pier T Avenue (see Figure 2-9).

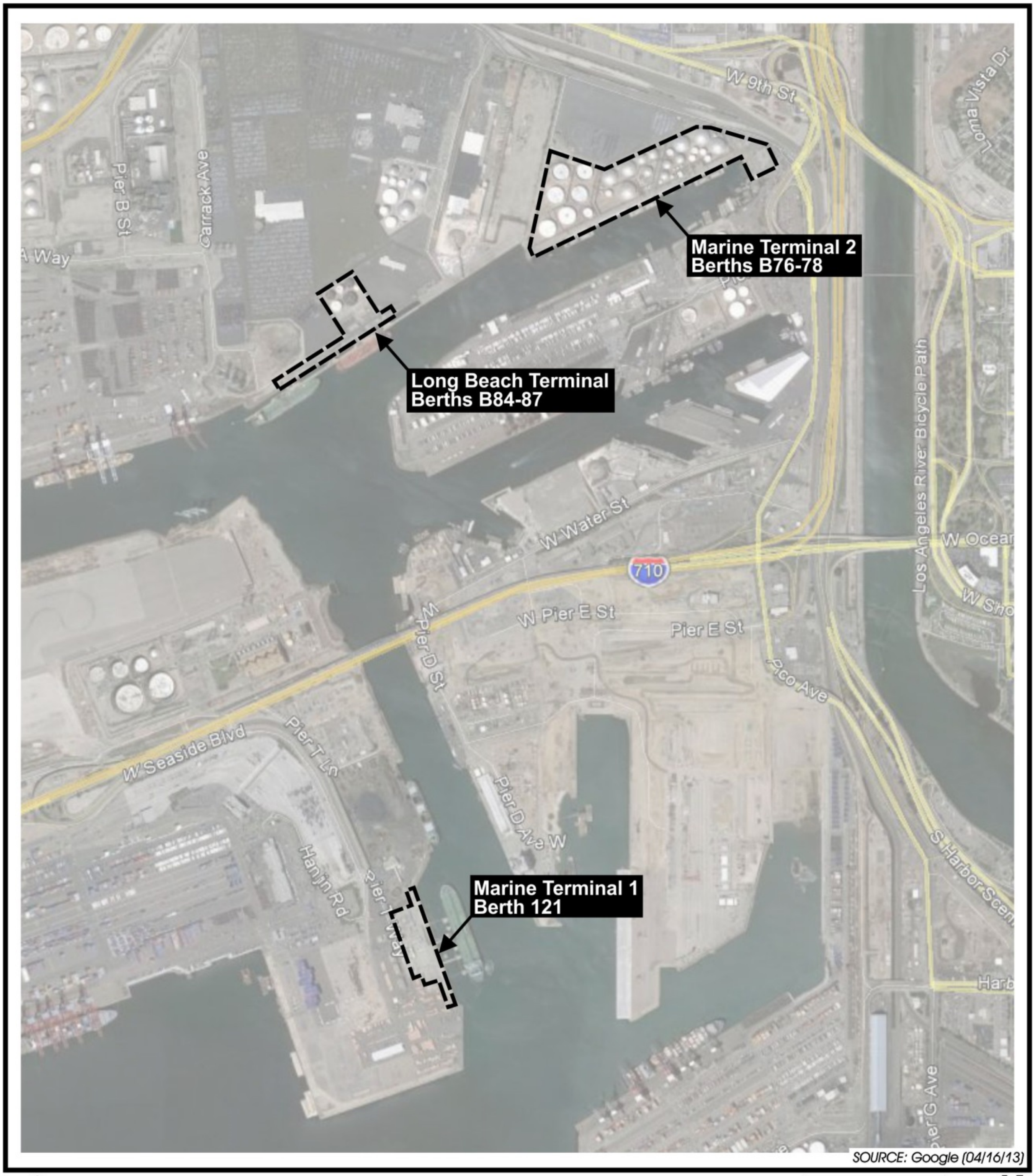


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FIGURE 2-9
MARINE TERMINALS ASSOCIATED WITH
TESORO LOS ANGELES REFINERY

Project No. 2844

N:\2844\Harbor Berth Map\Harbor Berth Map (rev.1).cdr

Marine Terminal 2 encompasses 18 acres, with a berth length of 2,200 feet. The wharf height at this berth is 14.4 feet, with a design water depth of 46 feet. The marine terminal includes a tank farm containing 34 above ground storage tanks with a total storage capacity of 1,800,000 barrels and has several pipeline connections, with loading arms capable of loading rates between 10,000 to 15,000 barrels per hour of various petroleum products and crude oils. Three vessels can be loaded or discharged simultaneously.

The Long Beach Terminal encompasses 11 acres, with a berth length of 1,980 feet. The wharf height at this berth is 16.8 feet, with a design water depth of 52 feet. The marine terminal includes a tank farm containing six above ground storage tanks with a total storage capacity of 245,000 barrels. Products unloaded at this terminal include crude oil, petroleum products and bunker fuel. The terminal has a 24-inch pipeline that connects into storage tanks at the Wilmington Refinery with a discharge capacity of 32,000 barrels per hour. Two vessels can be loaded or discharged simultaneously.

Marine Terminal 1 encompasses six acres, with a berth length of 1,140 feet. The wharf height at this berth is 22.4 feet, with a design water depth of 76 feet. The terminal has 42-inch and 24-inch pipelines, but does not contain any on-site storage capability. Only crude oil is unloaded at this terminal and, because there is no on-site storage, the crude oil is piped directly to the Carson Crude Terminal located near the Carson Operations. The terminal also connects to other storage facilities in the vicinity including Terminal 2. The terminal can accommodate very large crude carriers (VLCCs) that can carry up to two million barrels of crude oil. Only one vessel can be unloaded at a time and discharge rates can be up to 80,000 barrels per hour.

The proposed project does not include any physical or operational changes to the existing marine terminals. Additionally, no changes to the pipelines connecting the marine terminals to the Refinery are planned as a result of the proposed project.

2.7 PROPOSED PROJECT

The crude oil and feedstock processing capability at the integrated Refinery will increase approximately two percent or 6,000 bbl/day as a result of the proposed project due to a revision of the described duty of the Wilmington Operations Coker fresh feed heater (Heater H-100) in the existing permit to conform with SCAQMD and industry standards. Please see Section 2.7.1.3 for more information. Crude oil throughput of the Refinery can only increase by a relatively small amount unless other modifications are made to the units that initially process the crude oil, such as the Crude Units or the Delayed Coker Unit as described above in Section 2.5.4.1. Except for the above-described permit revision, no other modifications to the Crude Units or Delayed Coker Units to increase throughput capacity are included as part of the proposed project; therefore, no other increase in crude capacity will occur.

The Carson and Wilmington Operations currently obtain crude oil and feedstock from a variety of world-wide sources; in general, these sources are not expected to change as a result of the proposed project. Feedstocks include, but are not limited to, intermediate gas oil, transmix (a mixture of pipeline products; such as gasoline, jet, and diesel) and internally recycled oil.

Modifications to various units at the Carson and Wilmington Operations will be made to recover diesel and jet fuel boiling point range material, also known as distillate, from gas oil that is currently fed to the FCCUs at both Wilmington and Carson Operations. This will enable the remaining heavier gas oil feed from the Wilmington Operations FCCU to be diverted to the Carson Operations FCCU, while maintaining the same overall level of transportation fuels production. In addition, facilities will be added to remove impurities such as sulfur, nitrogen compounds, and organic acids from distillates in order to make on-specification products. The various Refinery modifications will be designed so that the combined Refinery operates within the existing capacity of the SRPs. Following project completion, when the diesel and jet range material are recovered and the remaining gas oil feed is diverted to the Carson Operations FCCU, the FCCU at Wilmington Operations will be shut down and the Refinery will be integrated as one operating Refinery. Figure 2-10 shows a block flow diagram of the integrated Refinery operations following the proposed project. Simplified block flow diagrams highlighting the production of diesel fuel, jet fuel, and gasoline are shown in Figures 2-11, 2-12, and 2-13, respectively. Figures 2-11 through 2-13 show additional detail on how diesel, jet and gasoline streams will be affected by the proposed-project. In order to maintain the same overall levels of transportation fuels production from the Refinery, the following general categories of Refinery modifications are planned: (1) Distillate recovery and upgrade; (2) Tier 3 gasoline compliance; and, (3) Gasoline production flexibility (e.g., maintain gasoline production capability following shutdown of the Wilmington Operations FCCU). Sections 2.7.1 and 2.7.2 below describe in more detail the various project elements that will be implemented to achieve these and the other project objectives. The following subsections describe in more detail proposed project modifications and new equipment at both the Wilmington and Carson Operations.

2.7.1 WILMINGTON OPERATIONS

The proposed project includes several process modifications to improve efficiency and achieve integration that are essential to enable shutting down the Wilmington Operations FCCU, which is expected to substantially reduce emissions at the integrated Refinery. Reconfiguring the combined Refinery complex is expected to improve the gasoline to distillate production ratio and is anticipated to result in minor increases in air pollutant emissions from some units. However, the net effect on overall emissions from the proposed project is expected to be overall Refinery emissions reductions, primarily associated with process modifications to improved efficiency and integration, enabling the shutdown of the Wilmington Operations FCCU, as well as shutdown or reduced operations of other equipment at the Refinery. Additionally, equipment production efficiency and heat recovery will be optimized for new and modified units, as specified in the following discussions, to further reduce overall Refinery emissions and optimize energy utilization. Proposed new equipment and modifications to existing equipment for the Wilmington Operations are shown in Figure 2-14 and are described further in the following subsections.

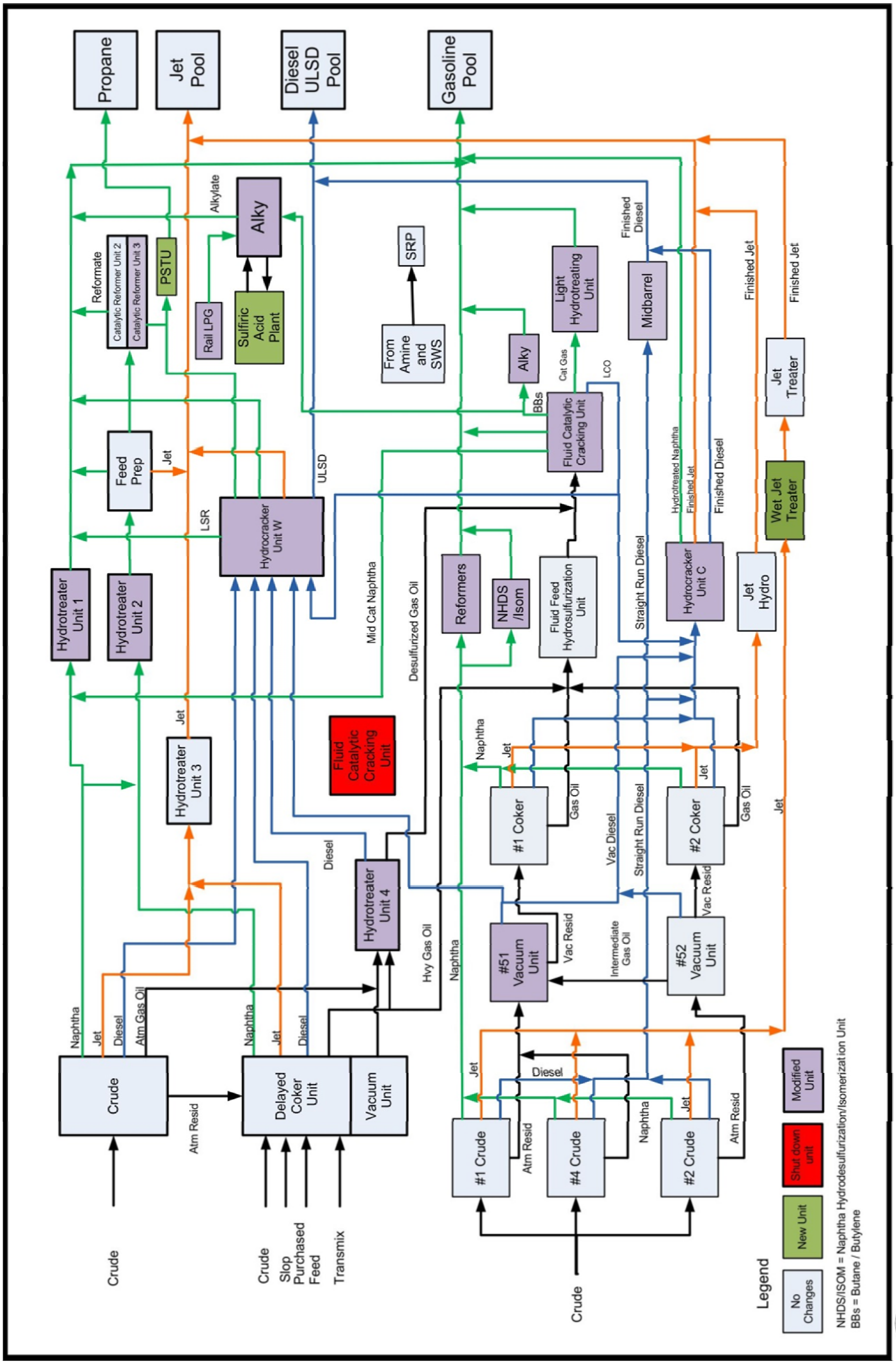

FIGURE 2-10
PROPOSED BLOCK FLOW DIAGRAM
TESORO LOS ANGELES REFINERY

Project No. 2844
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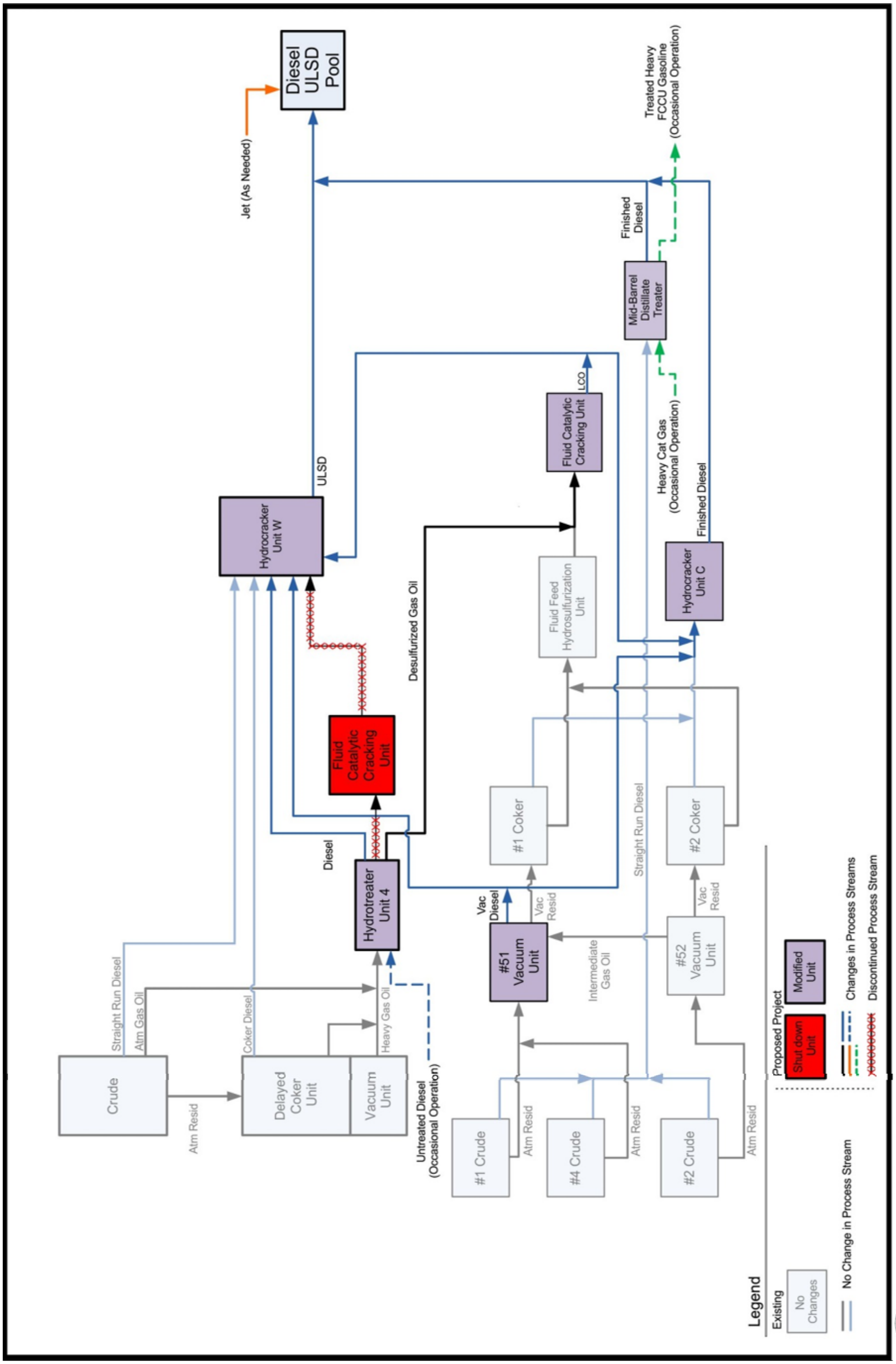

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FIGURE 2-11
SIMPLIFIED DIESEL FUEL PRODUCTION BLOCK FLOW DIAGRAM
WITH PROPOSED PROJECT EFFECTS DEPICTED
TESORO LOS ANGELES REFINERY

Project No. 2844
N:\2844\Block Flow Diagrams\Proposed Simplified Diesel Block Flow (rev.1).cdr

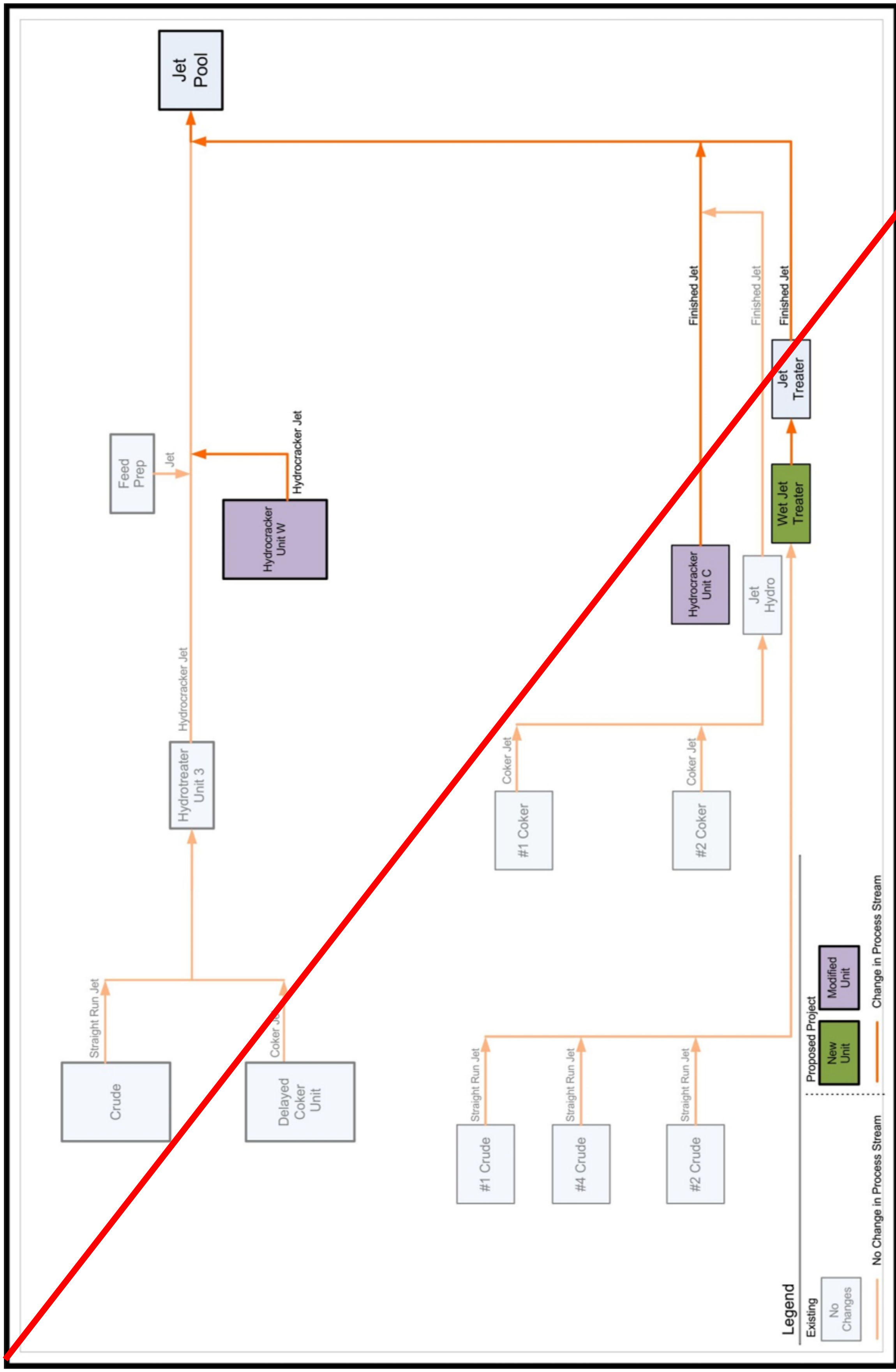

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FIGURE 2-12
SIMPLIFIED JET FUEL PRODUCTION BLOCK FLOW DIAGRAM
WITH PROPOSED PROJECT EFFECTS DEPICTED
TESORO LOS ANGELES REFINERY

Project No. 2844
N:\2844\Block Flow Diagrams\Proposed Simplified Jet Block Flow (rev.1).cdr

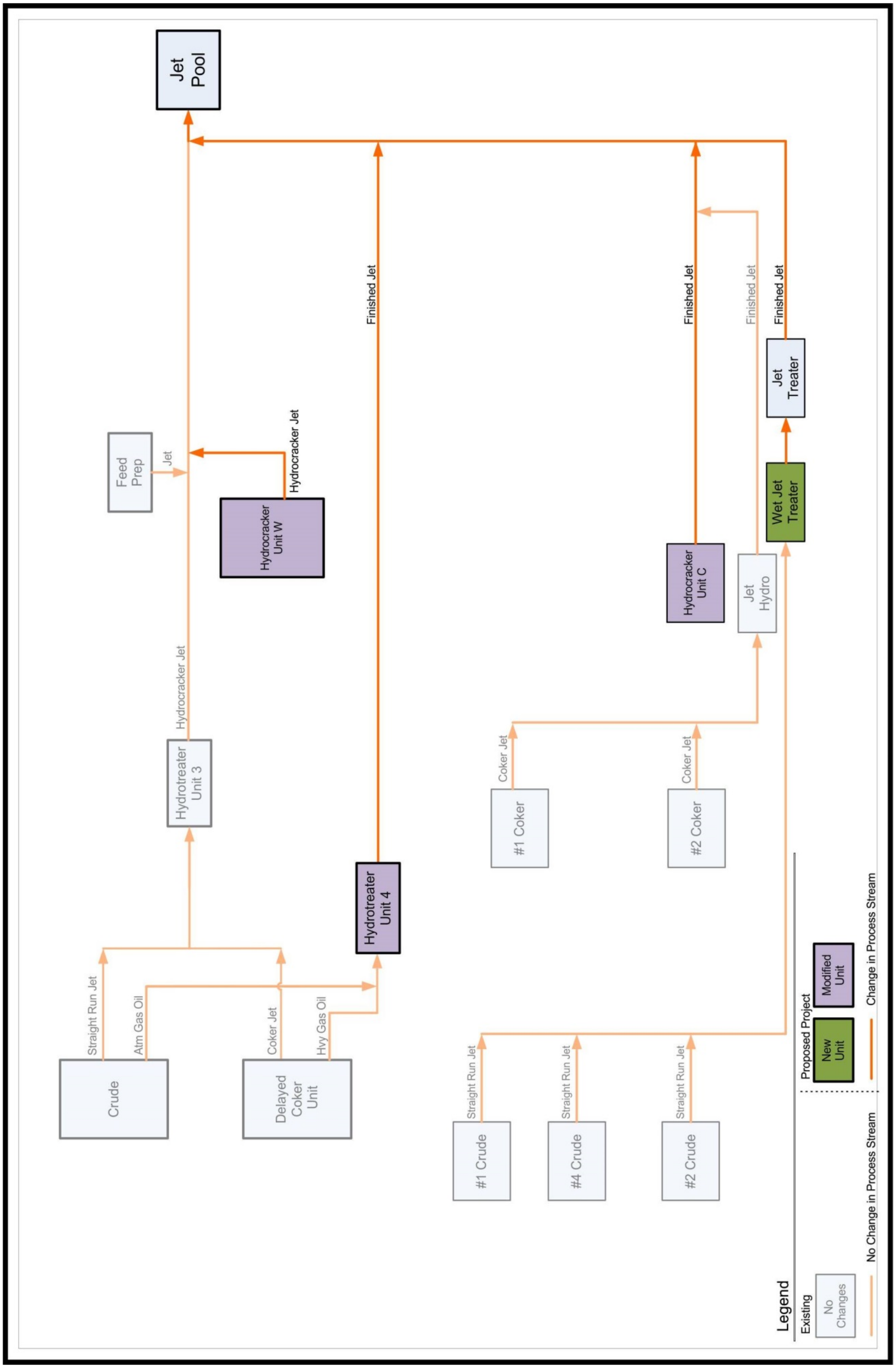

FIGURE 2-12
SIMPLIFIED JET FUEL PRODUCTION BLOCK FLOW DIAGRAM
WITH PROPOSED PROJECT EFFECTS DEPICTED
TESORO LOS ANGELES REFINERY

Project No. 2844
N:\2844\Block Flow Diagrams\Proposed Simplified Jet Block Flow (rev.2).cdr

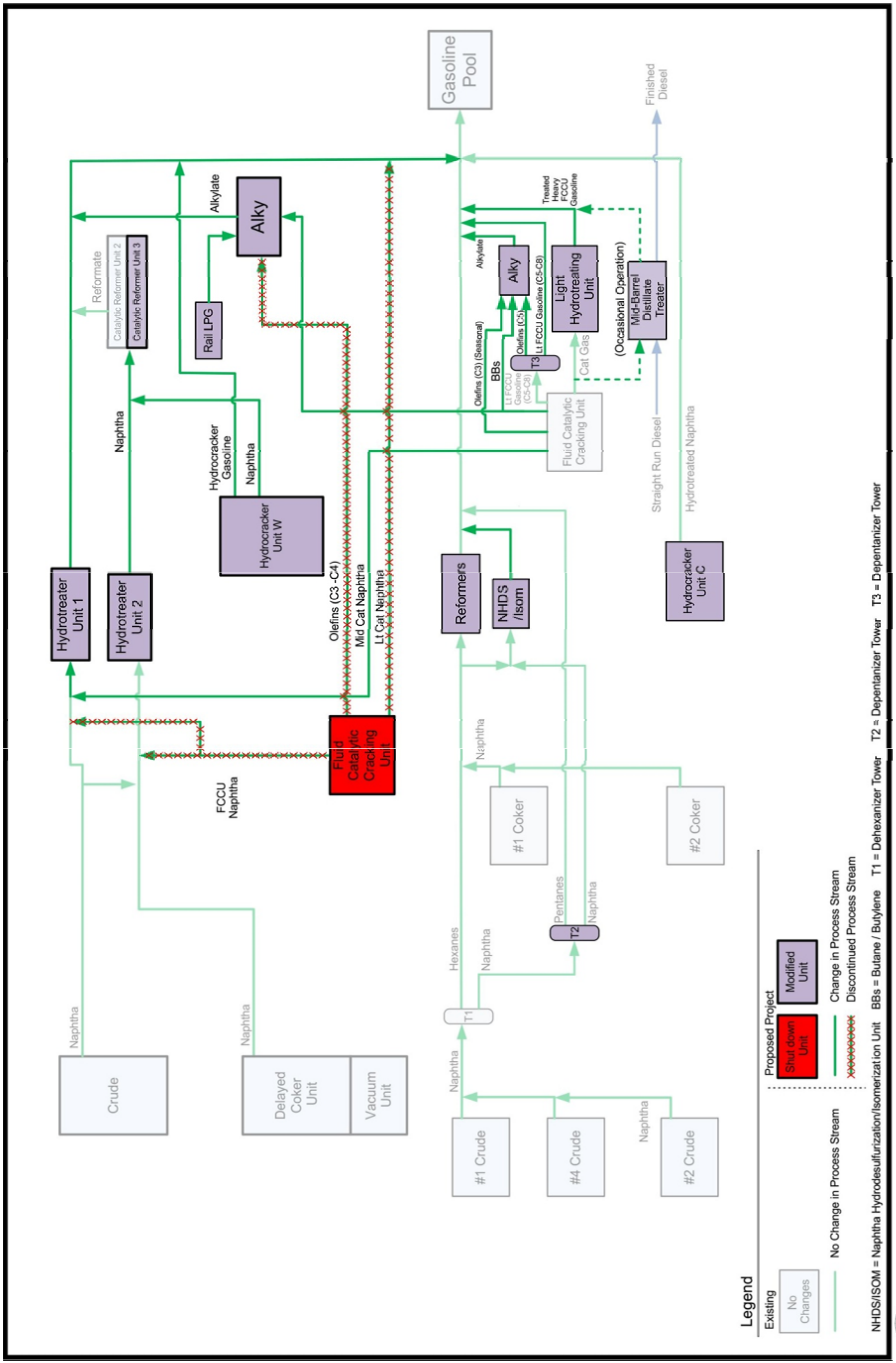

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FIGURE 2-13
SIMPLIFIED GASOLINE PRODUCTION BLOCK FLOW DIAGRAM
WITH PROPOSED PROJECT EFFECTS DEPICTED
TESORO LOS ANGELES REFINERY

Project No. 2844
N:\2844\Block Flow Diagrams\Proposed Simplified Gasoline Block Flow (rev.2).cdr

I:\2844\Tesoro Wilmington Site Plan (rev.14) **(Created)** 01/22/14 **(Drawn By)** A.S.K. **(Check By)** D.B.S. **(Last Rev.)** 08/17/2015

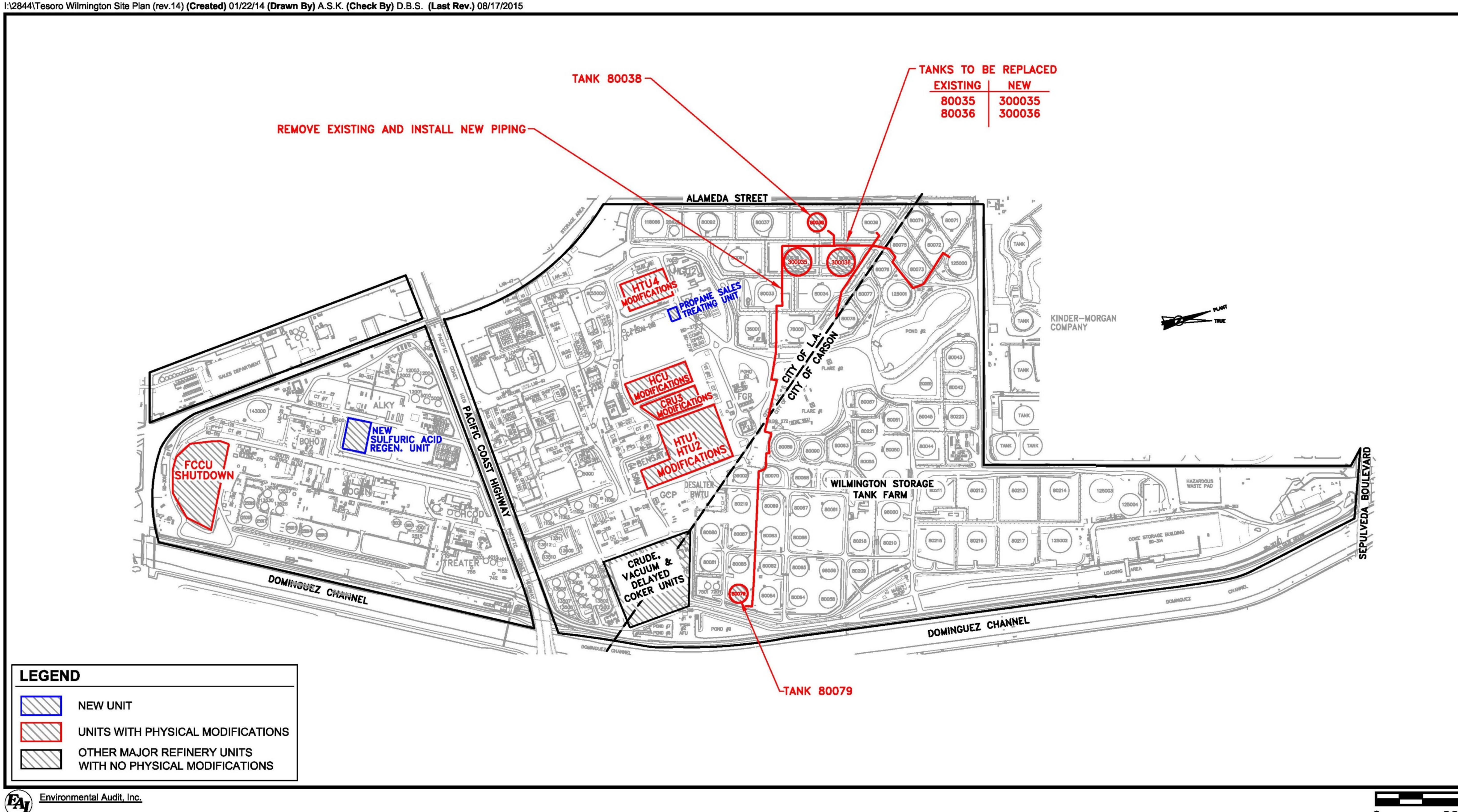

FIGURE 2-14
TESORO LOS ANGELES REFINERY
WILMINGTON OPERATIONS MODIFICATIONS

Project No. 2844

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In the Notice of Preparation/Initial Study (NOP/IS) for the proposed project (see Appendix A) the project description for the Wilmington Operations included the construction of a New Ammonium Thiosulfate (ATS) Plant. The ATS Plant scope has been eliminated from the proposed project and will not be built; therefore, no impacts associated with the ATS Plant will be analyzed in this EIR.

2.7.1.1 Wilmington Operations FCCU Shutdown

An FCCU cracks or converts heavy hydrocarbons into lighter, gasoline and distillate range hydrocarbons in the presence of fine particles of catalyst that are circulated throughout the process. The Refinery will modify other units to ensure there will be no loss in overall production due to the FCCU shutdown, prior to taking the FCCU offline. Following completion of elements of the project that enable distillate recovery and other modifications necessary to enable shutdown of the Wilmington Operations FCCU, the Wilmington Operations FCCU will be shut down, the equipment will be permanently removed from service, abandoned in place and Tesoro will relinquish all relevant Wilmington Operations FCCU operating permits to the SCAQMD. Substantial on-site emissions reductions will be realized from shutting down the following emissions sources that constitute the entire Wilmington Operations FCCU, including coke burn from the FCCU and ancillary heaters totaling 687.3 million British Thermal Units per hour (mmBtu/hr):

- FCCU regenerator (FCCU coke burn),
- CO Boiler (300 mmBtu/hr),
- H-2 Steam Superheater (37.4 mmBtu/hr),
- H-3 Fresh Feed Heater (94.7 mmBtu/hr),
- H-4 Hot Oil Loop Reboiler (127.2 mmBtu/hr),
- H-5 Fresh Feed Heater (44 mmBtu/hr),
- B-1 Startup Heater (84 mmBtu/hr), and
- All FCCU fugitive emission components.

2.7.1.2 Hydrocracker (HCU) Modifications

The Wilmington Operations HCU cracks or converts mid-distillate and heavy hydrocarbons to lighter gasoline, jet, and diesel range material in the presence of catalyst, heat, and hydrogen. The process incorporates a hydrotreater which reduces the sulfur content of the diesel. While the Wilmington Operations HCU capacity would be increased approximately 15 percent, this modification will have no impact on the overall integrated Refinery crude throughput capacity. The Wilmington Operations HCU capacity is being increased to accommodate conversion of the distillate material previously routed to the Wilmington Operations FCCU. It will be recovered as HCU feed in order to reduce the amount of gas oil feed produced and to enable the shutdown of the Wilmington Operations FCCU. The reactor and fractionation sections will be modified to increase the production of ultra-low sulfur diesel and gasoline. The Wilmington Operations HCU modification will include adding new nozzles to two existing vessels, modifying the hydrogen recycle compressor internals to accommodate higher unit capacity, installing a small hydrogen booster compressor, installing or modifying as many as three heat exchangers to provide improved heat integration, installing two new electrically driven pumps, and associated piping and instrumentation. Part of the piping associated with unit modifications may include installation of new pressure relief valves that will tie into the various Refinery flares. The pressure relief valves allow gases to vent to the flares, which are safety equipment, during emergency or over-pressure situations. The proposed project currently includes increasing the permitted firing duty of two existing heaters, with a common stack and selective catalytic reduction unit (SCR), by a total of 25 mmBtu/hr.

To recover propane for the proposed new Propane Sales Treating Unit (PSTU) described below, the HCU (W) fractionation section will also be modified by installing two new water cooled exchangers, one knockout drum, and associated piping and instrumentation. An existing reflux pump and two heat exchangers in the fractionation section will be removed.

2.7.1.3 Delayed Coker Unit (DCU) Fresh Feed Heater H-100

The Wilmington DCU fresh feed heater H-100 heats DCU charge, a mixture of crude oil, residual from the Crude Unit, slop oil (internally recycled oil and off-specification products) and FCCU main fractionator bottoms. H-100 provides heat to separate the DCU charge~~that are fed into the unit so they can be fractionated~~ into feedstock streams for other refinery process units. The heater has 36 burners. Each burner can operate up to a maximum heat release of 8.4 mmBtu/hr. Thus, the maximum heat release of the heater as a whole is 302.4 mmBtu/hr (36 x 8.4 = 302.4). The heater manufacturer, however, only guarantees that each burner will operate up to 7 mmBtu/hr. Thus, the guaranteed heat release of the heater as a whole is 252 mmBtu/hr (36 x 7 = 252).~~The existing equipment description of the Fresh Feed Heater in the Title V permit will be revised to conform to SCAQMD/Industry standards. The description will be changed from the 'design heat release' basis (252 mmBtu/hr) to the industry standard 'maximum heat release' basis (302.4 mmBtu/hr). Revising the equipment description to maximum heat release will ensure that operating the heater at maximum heat released conforms with the SCAQMD's expectation that equipment is operated within the maximum heat release described in the permit.~~

The Refinery has at times operated Heater H-100 above the guaranteed heat release level of 252 mmBtu/hr when it needed~~Additional heat is needed at times~~ to either lift more gas oil out of the Coker feed in downstream distillation columns or simply to process more feed through the DCU, to the physical limits of the downstream units. For example, during a Coker shutdown, residuum and crude oil inventory that are normally processed in the unit accumulate. After a shutdown, it is necessary to process feedstocks at a higher rate in order to process the ~~inventory gains of~~ excess feedstock that accumulated during a shutdown.

The current Title V permit describes the H-100 heater based on the heater's guaranteed heat release of 252 mmBtu/hr. As part of the proposed project, this description will be revised to reflect the heater's actual maximum level of operation (302.4 mmBtu/hr) rather than the lower guaranteed level of operation (252 mmBtu/hr). Heater H-100 will not be physically modified in any way as part of the project. And, as described above, the heater has operated above 252 mmBtu/hr in the past. Nonetheless, the DEIR made the conservative assumption that the change in permit description would allow Tesoro to increase the maximum operation of heater H-100 from 252 mmBtu/hr to 302.4 mmBtu/hr. In order to ensure that this assumed increase in operations would not result in any increase in emissions, the SCAQMD imposed a new permit condition that limits daily emissions of criteria pollutants from the H-100 heater to levels that would be generated if the heater were never operated above 252 mmBtu/hr. This would be achieved through efficient maintenance and operation of air pollution control equipment. These limits apply to mass emissions of CO, NOx, SOx, particulate matter less than ten microns in diameter (PM10), and volatile organic compounds (VOC).

~~Alternatively, higher crude rates may be processed in the DCU heater as analyzed herein. No physical modifications are planned to be made to the heater. However, modifications may be required during the permit review process. The maximum heater firing capability will remain unchanged. The number of burners (36) and the maximum heat release (8.4 mmBtu/hr) of each burner in the heater will remain the same. Although the described duty of the heater will increase to 302.4 mmBtu/hr, there will be no increase in emissions as permit conditions will be imposed to limit criteria pollutant emissions. Mass emissions of NOx, SOx, PM10, CO, and VOC will be restricted in the revised permit.~~

The application to revise the permit description of H-100 heater was submitted in early 2014, independent of the proposed project. As a result, this component of the proposed project was not described in the NOP/IS. But upon further review, it was concluded that this description change had the potential to~~could~~ create adverse environmental impacts ~~that would likely occur simultaneously with the proposed project.~~because, for example, it could enable a slight ~~this revision to the heater equipment description has the potential to~~ increase ~~the~~in crude oil throughput to the Refinery ~~by~~of up to two percent (or up to 6,000 bbl/day). While the Refinery could opt to process either a small increase in crude oil throughput or slightly heavier crude oil blend, the processing of additional crude oil would result in greater environmental impacts ~~more impacts in numerous units~~ downstream of the DCU, , as described in Section 4.1.2.1, versus an increased coke production for the DCU associated with a heavier crude oil blend. Therefore, for purposes of analyzing the worst-case impacts, this document assesses an increase in crude oil throughput capacity. The increased heat release from the H-100 heater and/or increased crude oil throughput is anticipated to occur once the modified permit is issued. Including the permit revision as part of the proposed project ensures that all possible impacts from the modification of the Refinery are fully analyzed.

2.7.1.4 Catalytic Reforming Unit No. 3 (CRU-3) Modifications

The Wilmington Operations CRU-3 converts low octane hydrocarbons into higher octane gasoline blending components using catalyst and heat. To enable the Refinery process efficiency improvement to recover and treat propane for sale, the CRU-3 fractionation section will be modified to enable recovery of Hydrocracker propane from the Refinery fuel gas system. The modifications to CRU-3 will include installing one new depropanizer tower that is larger than the existing tower, as many as three heat exchangers, as many as four electrically driven pumps, and associated piping and instrumentation. Part of the piping associated with unit modifications may include installation of new pressure relief valves that will tie into the various Refinery flares. The pressure relief valves allow gases to vent to the flares, which are safety equipment, during emergency or over-pressure situations.

2.7.1.5 Propane Sales Treating Unit (PSTU)

A new PSTU will be constructed at the Wilmington Operations to enable the process efficiency improvement to treat propane for sale. A PSTU conditions liquid propane for sale using absorbers and dryers to meet sales specifications. The PSTU will treat up to approximately 2,000 bbl/day of propane and will include eight vessels and four pumps that will be installed to purify recovered propane from the Wilmington Operations HCU and CRU-3. Part of the piping associated with unit may include installation of new pressure relief valves that will tie into the various Refinery flares. The pressure relief valves allow gases to vent to the flares, which are safety equipment, during emergency or over-pressure situations. The PSTU will be located east of HTU-4.

2.7.1.6 Hydrotreating Units No. 1 and 2 (HTU-1 and 2) Modifications

The Wilmington Operations HTU-1 and HTU-2 Naphtha Hydrotreaters are process units that reduce impurities such as sulfur from various naphtha product streams and currently hydrotreat FCCU gasoline. The HTU-1 will be modified to hydrotreat an additional 7,000 bbl/day of FCCU gasoline to comply with the federally mandated Tier 3 gasoline specifications. The modifications to HTU-1 will include modifying or installing as many as five heat exchangers, adding a pump and associated piping and instrumentation. Because the HTU-2 will continue to produce the same types and volumes of feedstock that it currently produces, its feedstock will be separated from HTU-1's feedstock. The HTU-2 feedstock separation modifications will include repurposing an existing diesel salt dryer to be used as a feed surge drum, installing as many as two electrically driven pumps, and associated piping and instrumentation. Part of the piping associated with unit modifications may include installation of new pressure relief valves that will tie into the various Refinery flares. The pressure relief valves allow gases to vent to the flares, which are safety equipment, during emergency or over-pressure situations.

The proposed modifications to HTU-1 will also allow it to start hydrotreating jet fuel instead of FCCU gasoline, treating approximately 12,000 bbl/day to remove sulfur impurities. The modifications will include installing one new stripping steam nozzle on the stabilizer, one coalescer, one salt dryer, and condensate pot, and associated piping and instrumentation.

2.7.1.7 Hydrotreating Unit No. 4 (HTU-4) Modifications

The Wilmington Operations Hydrotreater Unit No. 4 (HTU-4) is a process unit that uses catalyst and hydrogen to reduce aromatic compounds and impurities such as sulfur in the FCC feed.

HTU-4 will be modified as part of the proposed project to increase distillate yield and must be completed in order to allow for the shutdown of the Wilmington Operations FCCU, and to fully utilize the existing hydrotreating capacity to produce ultra-low sulfur diesel. There will also be modifications to recover jet fuel, and added heat integration equipment to reduce energy consumption by producing steam in heat exchangers, providing process heat to two strippers and preheating boiler feed water. HTU-4 will process either gas oil or high sulfur diesel. The proposed modification to the HTU-4 will allow the Refinery to minimize motor fuels production disruptions during both planned and unplanned outages. Other modifications to HTU-4 include adding new nozzles on the fractionator, modifying the product coolers, installing a new surge drum, a salt dryer, a coalescer, a condensate pot, as many as four new electrically driven pumps and eleven heat exchangers, and associated piping and instrumentation. Part of the piping associated with unit modifications may include installation of new pressure relief valves that will tie into the various Refinery flares. The pressure relief valves allow gases to vent to the flares, which are safety equipment, during emergency or over-pressure situations.

2.7.1.8 New Sulfuric Acid Regeneration Plant (SARP)

The proposed new Sulfuric Acid Regeneration Plant (SARP) will be constructed at the Wilmington Operations east of the existing Alkylation Unit and will remove impurities from and recycle the Wilmington and Carson Operations spent sulfuric acid to produce fresh sulfuric acid on-site rather than sending it off-site for treatment. Sulfuric acid is used as a catalyst in the Alkylation Unit to produce alkylate and loses its effectiveness over time. The SARP is sized for an approximate throughput of 400 tons/day of sulfuric acid production and regeneration and will include three tanks, as many as eight electrically driven pumps, a natural gas fired 42 mmBtu/hr Decomposition furnace, a five mmBtu/hr Converter heater, a natural gas fired 20 mmBtu/hr Process Air Heater, a waste heat steam generator, as many as four blowers, as many as eight heat exchangers, four towers, one reactor, one stripper, three scrubbers, one electrically driven compressor, three drums, and associated piping and instrumentation. Part of the piping associated with the SARP unit may include installation of new pressure relief valves that will tie into the various Refinery flares. The pressure relief valves allow gases to vent to the flares, which are safety equipment, during emergency or over-pressure situations. The fresh sulfuric acid will be sent back to the Alkylation Units for reuse. Spent sulfuric acid is currently transported off-site for recycling at the ECO Services Dominguez Carson Sulfuric Acid Plant located at 20720 S. Wilmington Avenue in Carson, California. Installing the Sulfuric Acid Regeneration Plant will eliminate approximately 6,000 acid transport truck miles per month from public roadways compared to current operations. Instead of routing trucks to and from the Wilmington Operations to ECO Services Dominguez Carson, the trucks will be routed to and from the Carson Operations to the Wilmington Operations, a much shorter trip.

2.7.1.9 Wilmington Replacement Crude Oil Tanks and Other Tank Modifications

To improve the efficiency of water-borne crude oil receipt and marine vessel unloading, two new 300,000 bbl internal floating roof storage tanks (Tanks 300035 and 300036) will replace two existing 80,000 bbl fixed-roof storage tanks (Tanks 80035 and 80036) in the north tank area of the Wilmington Operations. The two existing tanks currently store light and heavy crude oils as well as light and heavy gas oils. The two new tanks would store light and heavy crude oils as well as light and heavy gas oils, in support of continued operations. The new larger tanks will allow marine vessels to unload without undue delay, thereby reducing the time vessels are required to wait at anchorage until sufficient tankage is available for vessel discharge. The current 80,000 barrel crude storage tanks have insufficient capacity to completely unload the mid-size marine vessels (with capacities from 300,000 to 700,000 barrels) that deliver crude oil to the Long Beach Marine Terminal that serves Wilmington Operations. Given the large marine vessel capacity and the relatively small available refinery storage tank capacity, marine vessels must either wait at the dock for several days or make several port calls or dock visits in order to unload an entire cargo of crude oil. While the marine vessels are at the dock, in motion, and at anchor they are producing emissions from fuel combustion necessary for vessel operation. Increasing storage tank capacity will increase the amount of crude oil that can be unloaded and stored during a single marine vessel visit, thus, reducing the amount of time that vessels spend within the port. Decreasing the amount of time the vessels spend within the Port and at anchor will reduce annual vessel emissions. This proposed project does not require any modifications to the Wilmington Operations Marine Terminal in the Port of Long Beach. The new tanks will be permitted to store the same types of products as the existing tanks and are not expected to enable the Refinery to bring in a particular type of crude oil that cannot be blended to meet the API gravity and sulfur content parameters of the existing Wilmington and Carson Operations. Refinery crude throughput would increase up to two percent (6,000 bbl/day), but would otherwise be constrained as discussed in Subsection 2.5.4.1 The tanks only affect the ability to offload a marine vessel in less time.

The scope of this part of the proposed project will include demolishing two existing storage tanks, installing two new larger tanks in the same location as the tanks being removed, replacing 5,000 feet of 12-inch diameter piping with 24-inch diameter piping within the confines of the Wilmington Operations to allow the tank loading rate to increase from 5,000 bbl/hr to 15,000 bbl/hr. The scope includes modifying one existing tank (Tank 80038) by connecting it to a vapor recovery system. Existing Tanks 80038, 80060, 80067, and 80079 will require change of service permit modifications and annual throughput increases for each tank.

2.7.2 CARSON OPERATIONS

In addition to the modifications at the Wilmington Operations, the proposed Tesoro Los Angeles Refinery Integration and Compliance Project also includes modifications at the Carson Operations, resulting in a combined Refinery complex and improving the gasoline to distillate production ratio. Additionally, equipment energy efficiency and heat recovery will be optimized for new or modified units, resulting in lower overall emissions. Proposed new equipment and modifications to existing equipment at the Carson Operations are shown in Figure 2-15 and described in the following subsections.

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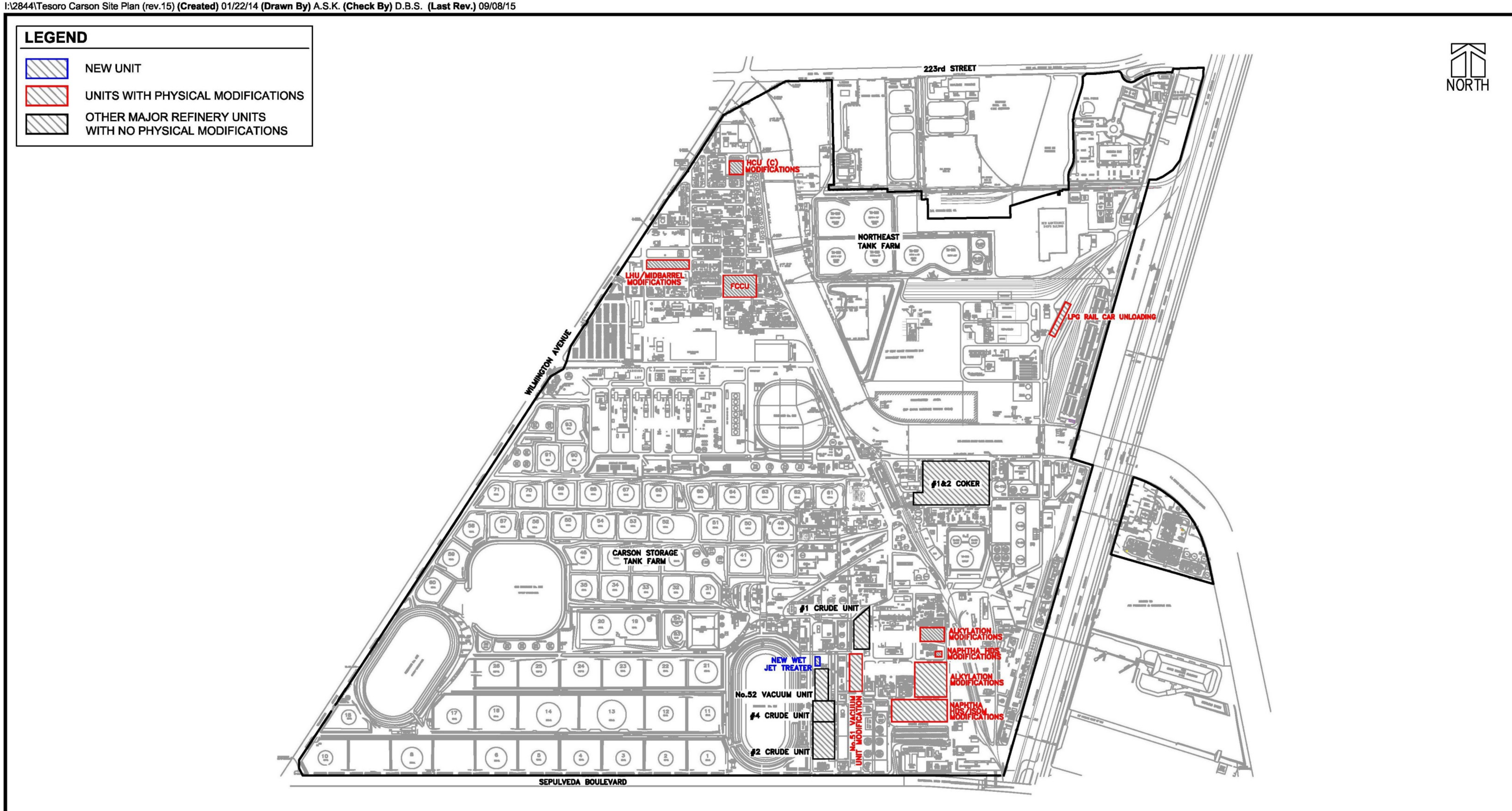

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FIGURE 2-15
TESORO LOS ANGELES REFINERY
CARSON OPERATIONS MODIFICATIONS

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In the NOP/IS the project description for the Carson Operations included modifications to the No. 1 and No. 2 Cokers to comply with SCAQMD Rule 1114 – Petroleum Refinery Coking Operations, which requires recovery of additional vent gases during coke drum deheading operations. Rule 1114 requires that the ejector system be installed at the next scheduled turnaround for each Coker unit. Compliance is required beginning in January 2016 for No. 2 Coker. The impacts of the SCAQMD Rule 1114 compliance projects were analyzed separately in the Environmental Assessment for the Rule 1114 adoption (SCAQMD, 2013). Prior to adoption of Rule 1114, the SCAQMD prepared an Environmental Assessment (EA) (Final Environmental Assessment for Proposed Rule 1114 – Petroleum Refinery Coking Operations; SCAQMD No. 02262013BAR; SCH No. 2013021066; Certified May 3, 2013) pursuant to its Certified Regulatory Program to evaluate potential impacts from implementing Rule 1114. The EA for Rule 1114 provided a comprehensive worst-case analysis of potential adverse impacts from Rule 1114 compliance projects at all of the individual affected refineries. The EA for Rule 1114 concluded that implementing Rule 1114 at all affected refineries would not generate significant adverse impacts to any environmental topic areas identified on the environmental checklist (CEQA Guidelines, Appendix G). Consequently, CEQA requirements for the Rule 1114 component of the proposed project have already been satisfied. As a result, the Rule 1114 compliance component has been removed from the proposed project. However, to the extent that the Rule 1114 compliance project contributes to cumulative impacts of the proposed project, these are evaluated in Chapter 5 of this EIR.

The NOP/IS also included the Nos. 1 and 2 Coker Bottom Head Modifications component. However, because this project component is associated with the Rule 1114 compliance project by improving safety during the coke de-heading process at the end of the coking cycle, it was also removed. Although not analyzed as part of the Rule 1114 EA, it was evaluated as part of the Rule 1114 permit application process and it was concluded that this project component was exempt from permitting, and thus, not subject to CEQA review. Like the Rule 1114 compliance project, to the extent that this project component contributes to cumulative impacts of the proposed project, they are evaluated in Chapter 5 of this EIR.

2.7.2.1 No. 51 Vacuum Unit Modifications

The Vacuum Unit is a separation process that uses distillation conducted under vacuum (less than atmospheric pressure) to lower the boiling temperature of a liquid and allow removal of light hydrocarbons without thermal cracking. The No. 51 Vacuum Unit will be modified to allow increased distillate yield, or diesel production, which will require reducing vacuum gas oil production by up to 8,000 bbl/day. The No. 51 Vacuum Unit modifications will include modifying the feed heater’s Title V permit described duty from 300 to 360 mmBtu/hr, installing one new sixteen-inch nozzle on the vacuum tower, as many as five new exchangers, two strainers, as many as three new electrically driven pumps, and associated piping and instrumentation. Part of the piping associated with unit modifications may include installation of new pressure relief valves that will tie into the various Refinery flares. The pressure relief valves allow gases to vent to the flares, which are safety equipment, during emergency or over-pressure situations. No substantial heater modifications are required to achieve a firing rate of 360 mmBtu/hr; however, burner/tips or other modifications may be replaced with a different design.

The heater duty increase will enable increased recovery of distillate out of gas oil in the vacuum column. However this will not enable the Refinery to run a lighter crude oil slate since the change will be made in No. 51 Vacuum Unit, which is downstream of the Crude Units. Please see Section 2.5.4.1 for further explanation of the modifications that would need to be completed in order to increase Refinery capacity to refine lighter crude oils.

2.7.2.2 Carson Operations FCCU Modifications

The FCCU cracks or converts heavy hydrocarbons into lighter, gasoline range hydrocarbons in the presence of fine particles of catalyst that are circulated throughout the process. The NOP/IS presented two types of modifications to the Carson Operations FCCU, physical and operational. The physical modifications (i.e., installing a feed surge drum, as many as two pumps and two heat exchangers, and associated piping and instrumentation) have been canceled and removed from the proposed project. However, the proposed process modifications to improve efficiency and achieve integration will still be included. This will enable shutdown of the Wilmington Operations FCCU, and allow the Carson Operations FCCU to accept a portion of the Wilmington Operations gas oil feed. The throughput capability of the Carson Operations FCCU will remain unchanged. New pipelines will be routed between the Wilmington Operations and the Carson Operations FCCU feed tanks. Although physical modifications to the Carson Operations FCCU are no longer proposed, the impacts from the potential increase in utilization of the Carson Operations FCCU have been addressed in Chapter 4.

2.7.2.3 New Wet Jet Treater

One new 50,000 bbl/day Wet Jet Treater will be installed at Carson Operations to treat jet fuel by removing mercaptans and reducing the TAN, or organic acid content, in the jet fuel produced in upstream units. The Wet Jet Treater will increase Refinery operating efficiency. The Wet Jet Treater sweetens jet fuel by converting mercaptans to disulfides, and reacting organic acid with caustic making naphthenic salts which are removed to reduce TAN. The Wet Jet Treater includes one mercaptan removal reactor, one TAN removal reactor, two product separators, one spent caustic loading facility, as many as six associated electrically driven pumps, two salt dryers, two clay filters, and associated piping and instrumentation. Part of the piping associated with unit modifications may include installation of new pressure relief valves that will tie into the various Refinery flares. The pressure relief valves allow gases to vent to the flares, which are safety equipment, during emergency or over-pressure situations. Feed and fresh caustic will be routed to the new Wet Jet Treater and spent caustic and treated jet fuel will be routed to existing storage tanks. The spent caustic flow rate is conservatively estimated at approximately 11 gpm. Approximately four additional railcar loads per week of spent caustic will be generated and shipped to the Gulf Coast for recycling.

2.7.2.4 Hydrocracker Unit (HCU) Modifications

The Carson Operations HCU capacity will be increased by approximately 10 percent. The existing Carson Operations HCU cracks or converts mid-distillate and heavy hydrocarbons to lighter gasoline, jet, and diesel range material in the presence of catalyst, heat, and hydrogen.

The process incorporates a hydrotreater which reduces the sulfur content. The Carson Operations HCU will be modified as part of the proposed project to increase distillate yield to allow for the shutdown of the Wilmington Operations FCCU by enabling it to process the distillate recovered from the No. 51 Vacuum Unit described above in Subsections 2.7.2.1.

Processing the recovered distillate feed will require increased hydrogen gas usage to allow the modified HCU to comply with existing low sulfur diesel product specifications. The increased hydrogen gas capacity will be provided by increasing the recycle gas compressor speed. This portion of the proposed project will not result in an overall increase in hydrogen demand because hydrogen that is currently used to hydrotreat the Wilmington Operations FCCU products would no longer be required due to the shutdown of the Wilmington Operations FCCU. Therefore, this portion of the proposed project will not require changes to hydrogen generation equipment at the Refinery or by an off-site supplier.

The Carson HCU energy utilization efficiency will be improved by installing a steam generator. The Carson HCU modification will include installing one new steam generator heat exchanger, an air cooler, and associated piping and instrumentation. Part of the piping associated with unit modifications may include installation of new pressure relief valves that will tie into the various Refinery flares. The pressure relief valves allow gases to vent to the flares, which are safety equipment, during emergency or over-pressure situations.

2.7.2.5 Light Hydrotreating Unit (LHU) Modifications

The existing Carson Operations Light Hydrotreating Unit (LHU) is a process unit that removes impurities such as sulfur in various naphtha product streams. The LHU will be modified to more effectively remove sulfur from FCCU gasoline to comply with the new federally-mandated Tier 3 gasoline sulfur specifications. The LHU will process a higher sulfur feed material derived from existing fractionation equipment. The proposed modifications will include installing one new stripping steam nozzle on the stabilizer, as many as five new heat exchangers, one coalescer, a condensate pot, and associated piping and instrumentation. Part of the piping associated with unit modifications may include installation of new pressure relief valves that will tie into the various Refinery flares. The pressure relief valves allow gases to vent to the flares, which are safety equipment, during emergency or over-pressure situations.

2.7.2.6 Naphtha Hydrodesulfurization Unit (NHDS) Modifications

The existing Carson Operations Naphtha Hydrodesulfurization (NHDS) Unit is a process unit that reduces impurities such as sulfur in various naphtha product streams. The NHDS will be modified with the installation of new equipment to allow removal of contaminants from unit feed and sulfur from pentanes. This enables flexibility for additional gasoline production to partially compensate for lost production from the Wilmington Operations FCCU. The existing Reactor Feed Heater will be retrofitted with new ultra-low NOx burners to reduce emissions. The new burners will not increase the existing heater duty described in the permit. The modifications will include repurposing and modifying the existing Isooctene debutanizer tower to separate isopentane from the Carson Operations NHDS feed. The modifications include the addition of eight new nozzles on the debutanizer tower, installation of a caustic scrubber, two knockout drums, a product coalescer, an air cooler, an accumulator, a condensate pot, as many as 14 new heat exchangers, six electrically driven pumps, and associated piping and instrumentation. Part of the piping associated with unit modifications may include installation of new pressure relief valves that will tie into the various Refinery flares. The pressure relief valves allow gases to vent to the flares, which are safety equipment, during emergency or over-pressure situations.

2.7.2.7 Naphtha Isomerization Unit Modifications

The existing Carson Operations Naphtha Isomerization Unit upgrades a pentane/hexane rich stream to make a higher value blending component for gasoline. In order to improve the saleable product yield, the Naphtha Isomerization Unit will be modified to recover propane and heavier material from the Unit off-gas, enabling additional product sales. The Naphtha Isomerization Unit modifications include addition of an off-gas caustic scrubber, two reactor effluent flash drums, up to two heat exchangers, four pumps, and associated piping and instrumentation. Part of the piping associated with unit modifications may include installation of new pressure relief valves that will tie into the various Refinery flares. The pressure relief valves allow gases to vent to the flares, which are safety equipment, during emergency or over-pressure situations.

2.7.2.8 Alkylation Modifications

The existing Carson Operations Alkylation Unit is a process unit that converts propylene (C3 olefins), and butylenes (C4 olefins) into gasoline boiling range blendstock. As a project component to increase gasoline production flexibility to partially compensate for lost production from the Wilmington Operations FCCU, amylenes (C5 olefins) will be recovered from FCCU gasoline in an existing fractionation tower and converted to low vapor pressure gasoline in the modified Alkylation Unit. Alkylation Unit capacity will remain unchanged. The modifications to process amylenes will include repurposing the Depentanizer column, replacing one existing four-inch nozzle with an eight-inch nozzle on the olefin feed surge drum, installing as many as six heat exchangers, one filter/coalescer, one truck loading rack, two electrically driven pumps, and associated piping and instrumentation. The modifications to process propylene and butylene will include the installation of a propylene chiller and associated piping and instrumentation. Part of the piping associated with unit modifications may include installation of new pressure relief valves that will tie into the various Refinery flares. The pressure relief valves allow gases to vent to the flares, which are safety equipment, during emergency or over-pressure situations.

2.7.2.9 Mid-Barrel Distillate Treater

The existing Mid-Barrel Distillate Treater incorporates a hydrotreater to remove sulfur from straight run diesel and converts it to ultra-low sulfur diesel. To ensure compliance with new federally-mandated Tier 3 gasoline specifications, the Mid-Barrel Distillate Treater will be modified to enable it to desulfurize heavy FCCU naphtha. Interconnecting pipelines to/from the LHU and Mid Barrel Distillate Treater will be installed. New bypass piping to recycle a portion of the product stream back to the feed system will also be installed.

2.7.2.10 Steam System Balance Modifications

The Carson Operations steam system demand will increase due to compliance with new federally-mandated Tier 3 gasoline specifications and amylene alkylation. The increased steam demand will be met by a combination of: installing waste heat steam generators (heat exchangers at the Wilmington Operations HTU-4 and the Carson Operations Hydrocracker), generating more steam from the existing Watson Cogen Facility, and reducing steam demand from existing steam turbines.

2.7.2.11 New Crude Tankage

To improve the efficiency of water-borne crude oil receipt and marine vessel unloading, up to six new 500,000 barrel floating roof crude oil storage tanks will be constructed adjacent to the Carson Crude Terminal (see Figure 2-16). The new tanks will allow marine vessels to unload crude oil without undue delay, thereby reducing the time vessels are required to wait at anchorage until sufficient tankage is available for vessel discharge.

In the shipping industry, marine vessels have become larger over time. Currently, crude oil marine vessels have the capacity to hold up to 2,000,000 barrels. Given the large marine vessel capacity and the relatively small available refinery storage tank capacity, marine vessels must make several port calls or dock visits in order to unload an entire cargo of crude oil. In between port calls, the marine vessels must leave the dock and anchor until there is available crude storage capacity in refinery tanks and the vessel can return to the dock for additional unloading. While the vessels are at the dock, in motion and at anchor they are producing emissions from fuel combustion necessary for vessel operation. This portion of the project will reduce the amount of time that vessels spend within the port and increase the amount of crude oil that can be unloaded and stored. Decreasing the amount of time the vessels spend within the port and at anchor will substantially reduce annual vessel emissions. The new tanks do not enable the Refinery to bring in a particular type of crude oil. Further, no Refinery equipment modifications will be made that will allow for changes in the existing API gravity or sulfur content specifications of the crude oil blend that can be run at the Refinery, and thus, would result in changes of imported crude oils. Refinery crude throughput would increase up to two percent (6,000 bbl/day), but would otherwise be constrained as discussed in Subsection 2.5.4.1. The tanks only affect the ability to offload a marine vessel in fewer port calls rather than the type of crude unloaded.

This element of the project will reduce the amount of time marine vessels spend within the port, but will not increase Refinery crude oil throughput. This portion of the proposed project does not require any modifications to Marine Terminals in the Port of Long Beach. The scope of the work will include installing up to six new tanks, as many as five electrically-driven transfer pumps, and associated piping and instrumentation at the Carson Operations. Piping within the Carson Crude Terminal to connect the six new 500,000 barrel tanks will be installed to connect the tanks to existing pipelines to the Carson Operations and Marine Terminal 1.

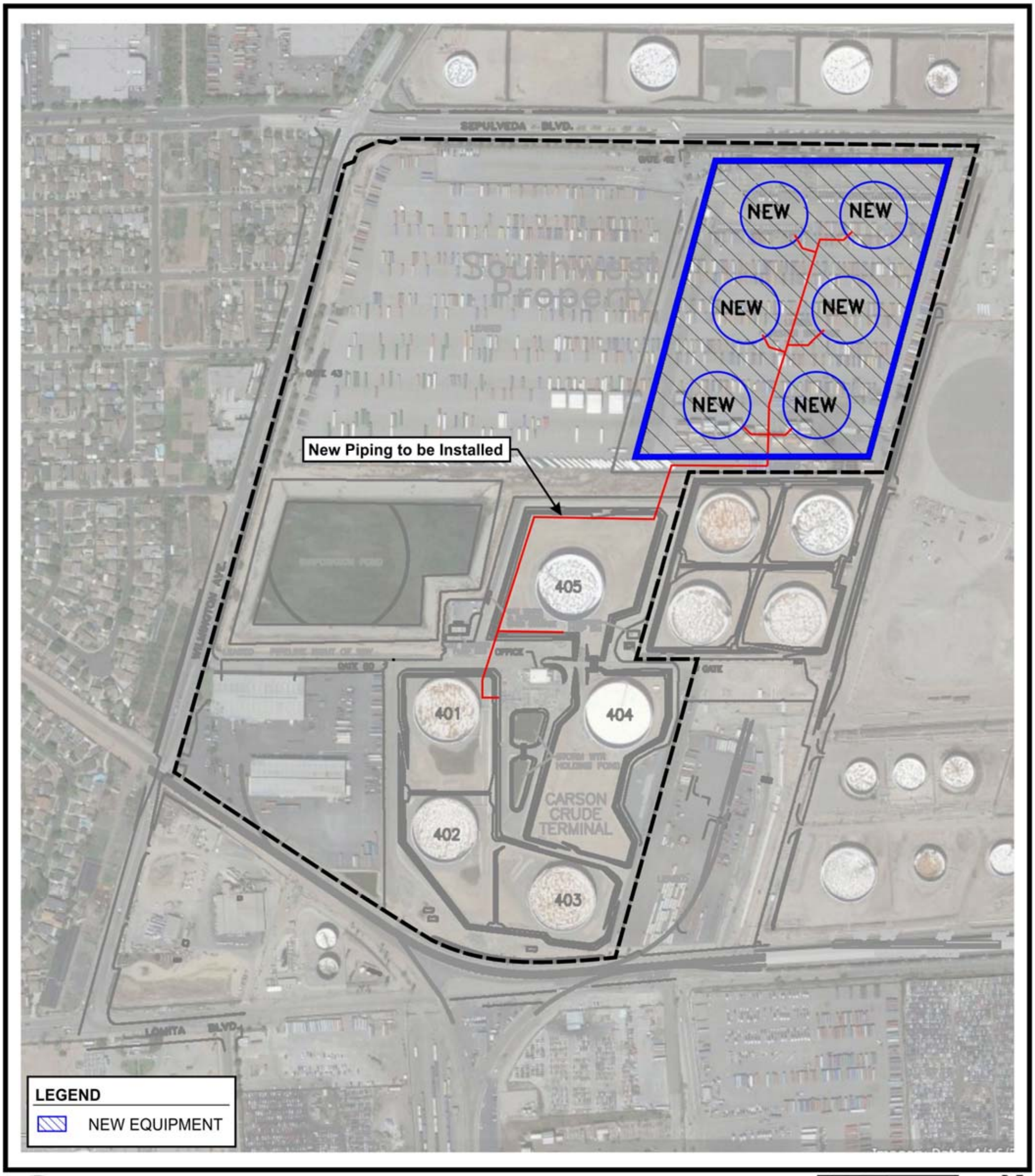

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FIGURE 2-16
TESORO LOS ANGELES REFINERY
CARSON CRUDE TERMINAL

Project No. 2844

N:\2844\Carson Crude Terminal (rev.2).cdr

2.7.3 MODIFICATIONS TO SUPPORTING EQUIPMENT

2.7.3.1 Interconnecting Pipelines

To more fully integrate the Refinery, this element of the proposed project includes pipelines to transport materials to and from various refinery units, e.g., new units, and storage facilities, as well as pipelines to transport materials between the Carson Operations and Wilmington Operations. The general locations of the proposed new pipelines are shown in Figure 2-17. The pipelines are expected to transport gasoline and gasoline blending components, crude oil, gas oil, butylene, propylene, and liquid petroleum gases. In this EIR, the term “pipelines” refers to all of the proposed pipelines shown in Figure 2-17, primarily pipelines on Tesoro property, but also portions of the pipeline that will be routed in a bundle under the Alameda Corridor and Sepulveda Boulevard. The interconnecting pipelines between the Carson and Wilmington Operations, including the pipeline bundle in the bore, includes approximately 15,000 feet of new 12-inch piping, 30,000 feet of new 10-inch piping and 40,000 feet of new 6-inch and 4-inch piping.

The proposed project would include installing a bundle of pipes under the Alameda Corridor and Sepulveda Boulevard as part of the work that will connect pipelines between the Wilmington and Carson Operations. The pipe “bundle” is where the pipelines come together in one place and go underground to cross adjacent streets. The pipe bundle will require a 54-inch bore using horizontal directional drilling (HDD). HDD would be used to bore underneath (approximately 80 feet in depth) South Alameda Street and East Sepulveda Boulevard (see Figure 2-17). The pipe bundle will be comprised of up to 15 new pipelines ranging in size from four inches to 12 inches in diameter. The pipelines are expected to transport gasoline and gasoline blending components, gas oil, crude oil, butylene, propylene, and LPG. All pipelines within the HDD bundle will be heavy-wall pipe with extra corrosion allowance, cathodic protection will be installed on all lines, and all lines will have a fusion bond epoxy coating with abrasion resistant coating. Isolation valves will be installed on both ends of the lines with flow meters to monitor for flow discrepancies and activate isolation valves if necessary. Pigging stations are proposed to be installed to enable periodic smart pigging of the lines using instrumented inspection devices allowing early detection of anomalies in the lines.

The Alameda Street crossing bore will be approximately 1,200 feet in length. The entry point of the bore into the ground is located in a container yard south of the Carson Operation Coke Barn on Tesoro-owned property. The proposed exit point of this bore is located near the Carson Operations truck weigh station. The pipelines would then be routed underneath East Sepulveda Boulevard to connect to the Wilmington Operations. This bore of the Sepulveda Boulevard crossing would also be approximately 1,200 feet in length. The proposed entry point of this bore under Sepulveda is located in the container yard south of the Carson Operation Coke Barn on Tesoro-owned property. The proposed exit point of this bore is located between Gate 22V and the Wilmington Operations Coke Barn. With the exception of pipelines that will be routed underground near the Carson and Wilmington Operations Coke Barns, pipelines located outside of the HDD bore, would then be routed above ground on pipe racks or ground level pipeline supports into the respective product and supply manifolds within the Refinery property. Note

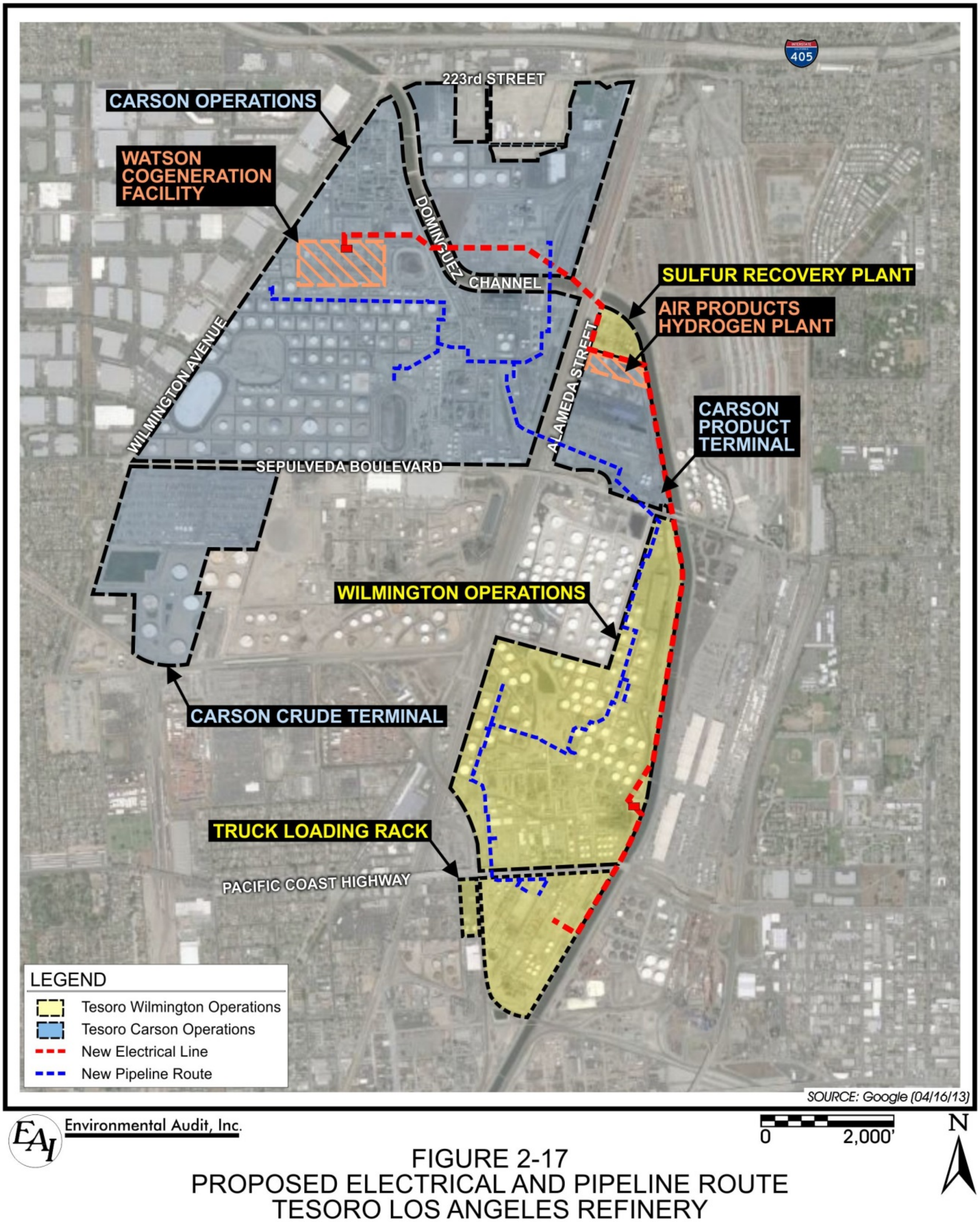


FIGURE 2-17
PROPOSED ELECTRICAL AND PIPELINE ROUTE
TESORO LOS ANGELES REFINERY

Project No. 2844

N:\2844\Interconnections (rev.3).cdr

that the bores for the pipeline bundle will start and end within the boundaries of the Tesoro Los Angeles Refinery.

2.7.3.2 Electrical Connection to Wilmington

To more fully integrate the Refinery, up to six new 69 kV electrical cables and two new 13.8 kV cables will be routed via conduit systems and overhead transmission lines from the Watson Cogen Facility located at the Carson Operations to the SRP (see Figure 2-17) and Wilmington Operations. One new 69 kV substation, and at least two new transformers with associated cabling, are proposed to be installed at the Watson Cogen Facility. One 69 kV substation with two new 13.8 kV main substations with at least four transformers and associated switch gear and wiring will be installed at the Wilmington Operations. Containment dikes will be provided at all transformers within the Refinery. This portion of the proposed project will allow electricity generated at Carson Operations to be used at the Wilmington Operations.

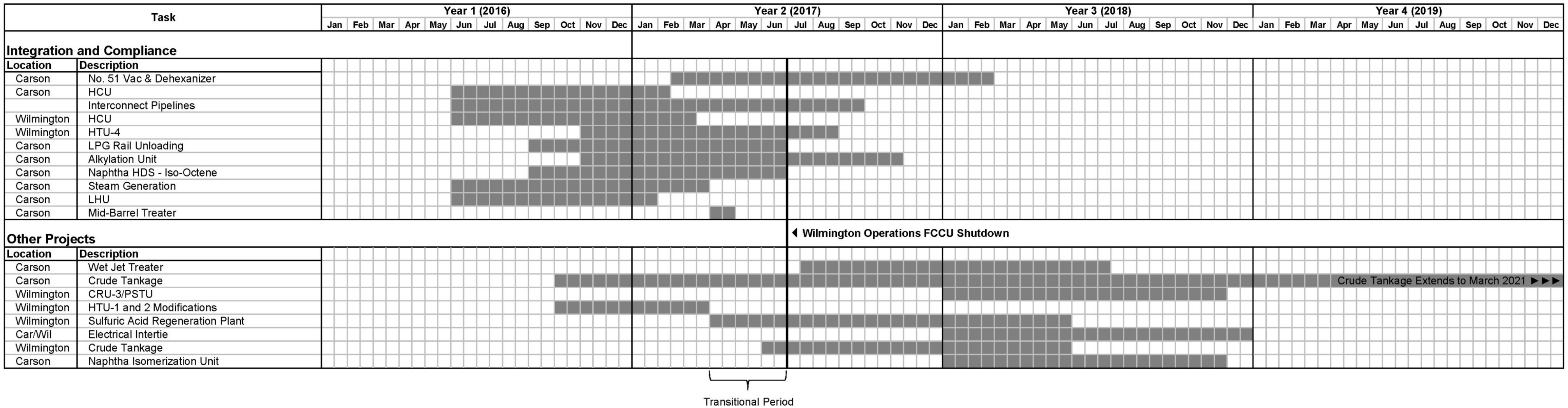
2.7.3.3 LPG Rail Unloading

LPG Rail Car Unloading facilities, which are permitted for LPG only, will be modified at Carson Operations to allow increased deliveries of approximately 4,000 bbl/day of Alkylation Unit feedstocks (LPG including propane, propylene, etc.). LPG Rail Unloading facilities will be used to transfer LPG to the Refinery to replace a portion of the Alkylation Unit feed lost by the closure of the Wilmington Operations FCCU. In addition to producing gasoline and other intermediate feedstocks, the FCCU provides feed to the Alkylation Unit. The Wilmington Operations FCCU produces about ten percent by volume mixed propylene/propane, which are currently fed to the Wilmington Operations Alkylation Unit. Alkylation Unit production is important in the manufacture of CARB compliant gasoline. Therefore, Tesoro will replace a portion of the alkylation feed through delivery of appropriate feedstocks. LPG handling at the Refinery may increase by up to ten railcars per day. Increased production of alkylate is critical for blending clean-burning gasoline due to its properties, such as low benzene and sulfur content and high octane content. The scope of work will include installing a vaporizer a surge drum, a knockout pot as many as four electrically driven transfer pumps, and associated piping and instrumentation. No modification to the onsite LPG storage is proposed because the LPG delivered will be transferred at a rate consistent to keep the Wilmington Operations Alkylation Unit operating within its capacity and existing storage tanks can accommodate the deliveries.

In the NOP/IS the project description included modifications to the LPG Railcar Unloading facilities at either Carson or Wilmington Operations. Tesoro has decided to pursue these modifications at the Carson Operations because it has existing infrastructure, including automated loading and unloading systems, existing LPG pressurized tankage, fire protection and other systems to ensure safe rail operations. Currently, Carson Operations safely unloads up to 11,000 bbl/day of LPG into on-site pressurized tankage for use in the refining process. In the past, during the high Reid Vapor Pressure (RVP) gasoline season, during winter months, October through February, the Refinery has imported up to 11,000 bbl/day of butane. The LPG rail loading modifications will allow the Refinery to import up to about 15,000 bbl/ day of LPG, resulting in the increase of about 4,000 bbl/day or 10 railcars per day at the Refinery. It is expected that these additional railcars would be added onto existing trains that visit the Refinery, i.e., the same train would drop off more railcars with each daily visit. Therefore, no increase in the number of rail trips is expected, but there would be an increase in the number of railcars transferred to/from the Refinery. The impacts of the increased use of rail are evaluated in Chapter 4.

2.8 CONSTRUCTION OF THE PROPOSED PROJECT

Construction activities for the proposed project ~~are~~were expected to begin in the second half of 2016 and ~~are~~were expected to be completed by March 2021, based on preliminary project engineering. The construction schedule is expected to commence following certification of the FEIR and issuance of permits. The dates used here and shown in Figure 2-18 will adjust accordingly. As shown in Figure 2-18, the preliminary construction schedule for each component of the proposed project varies. The construction activities for most of the components are expected to overlap from about the third quarter of 2016 to the second quarter 2017. Most construction activities are expected to be completed by the end of 2018. However, the construction activities associated with the crude oil storage tanks are not expected to be completed until March 2021. Construction work shifts are expected to last about ten hours per day during most portions of the construction schedule. During normal construction periods, one work shift per day is expected beginning at 7:00 a.m. and ending at 5:30 p.m. (allowing 30 minutes for lunch) five days per week. During Refinery turnaround periods (when some of the Refinery Units are shutdown), two work shifts are expected and work may be conducted 24 hours per day. Shifts would operate from 6:00 a.m. to 6:00 p.m. and 6:00 p.m. to 6:00 a.m. seven days per week. The preliminary project schedule will be refined as more detailed engineering is completed. Impacts associated with the construction schedule evaluated in Chapter 4 represent a worst-case scenario, i.e., when the greatest number of construction related activities (peak construction phase) are occurring per day.



Note: Wilmington DCU H100 and Carson FCCU Modifications are operational changes only and have no construction schedule.
Transitional Period is the 90-day period prior to the shutdown of the Wilmington Operations FCCU

FIGURE 2-18

CONSTRUCTION SCHEDULE
TESORO LOS ANGELES REFINERY

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The proposed project will increase traffic in the local area associated with construction workers, construction equipment, and the delivery of construction materials. The proposed project is expected to require up to about 950 construction workers during the peak construction phase, but during the construction period, 1800 total construction jobs are expected to be created by the proposed project.

Parking during construction activities is expected to require the use of several nearby parking lots to handle the increase in workers. The expected location of parking for construction workers is provided in Figure 2-19. Parking and traffic impacts are evaluated in Section 4.7 of this EIR. Once construction is complete, no increase in permanent workers is expected.

2.9 OPERATION OF THE PROPOSED PROJECT

Construction of the project will not affect where the Refinery obtains crude oil. The project is not designed to enable the Refinery to change its feedstock or crude oil blend. The Refinery will continue its practice of seeking cost-effective or advantaged crude oils that can be blended with other crude oils and feedstocks to create the necessary blends suitable for Refinery operations. As discussed in Section 2.5.4.1, even if the Refinery brings in more North American crude oil, which would occur independent of this project, the Refinery crude oil blend properties must remain within the existing operating envelope and therefore will not result in the need for more intensive processing such as additional heat or sulfur removal. Any shifts within the existing operating envelope, for example more or less sulfur, would have negligible impacts on operating emissions because the acceptable crude oil blends already vary, are tailored to complement the existing Refinery configuration, and the Refinery already operates at all ranges within the envelope. Thus peak daily emissions will not change as a result of an unrelated change in crude oil source.

Once construction of the proposed project is completed, the existing work force at the Refinery is not expected to increase or substantially change the volume of traffic. No increase in permanent workers is expected so no increase in worker traffic is expected. Construction of the Sulfuric Acid Regeneration Plant will decrease traffic in the area because spent sulfuric acid is currently transported off-site for recycling. Installing the Sulfuric Acid Regeneration Plant will eliminate approximately 6,000 acid transport truck trip miles per ~~month~~year that are currently used to transport spent and regenerated sulfuric acid to and from Wilmington Operations.

The proposed project is expected to affect rail traffic. Up to ten railcars per day may be used to transport LPG to the Carson Operations. In addition, about four railcars of spent caustic per week are expected to be generated and shipped to the Gulf Coast for recycling.

2.10 PERMITS AND APPROVALS

The proposed project may require approvals from a variety of federal, state, and local agencies. Discretionary permits and approvals are listed in Table 2.10-1. Permits and approvals that are ministerial (i.e., do not require discretion) are summarized in the following subsections and are discussed in the appropriate environmental topic in Chapters 3 and 4.

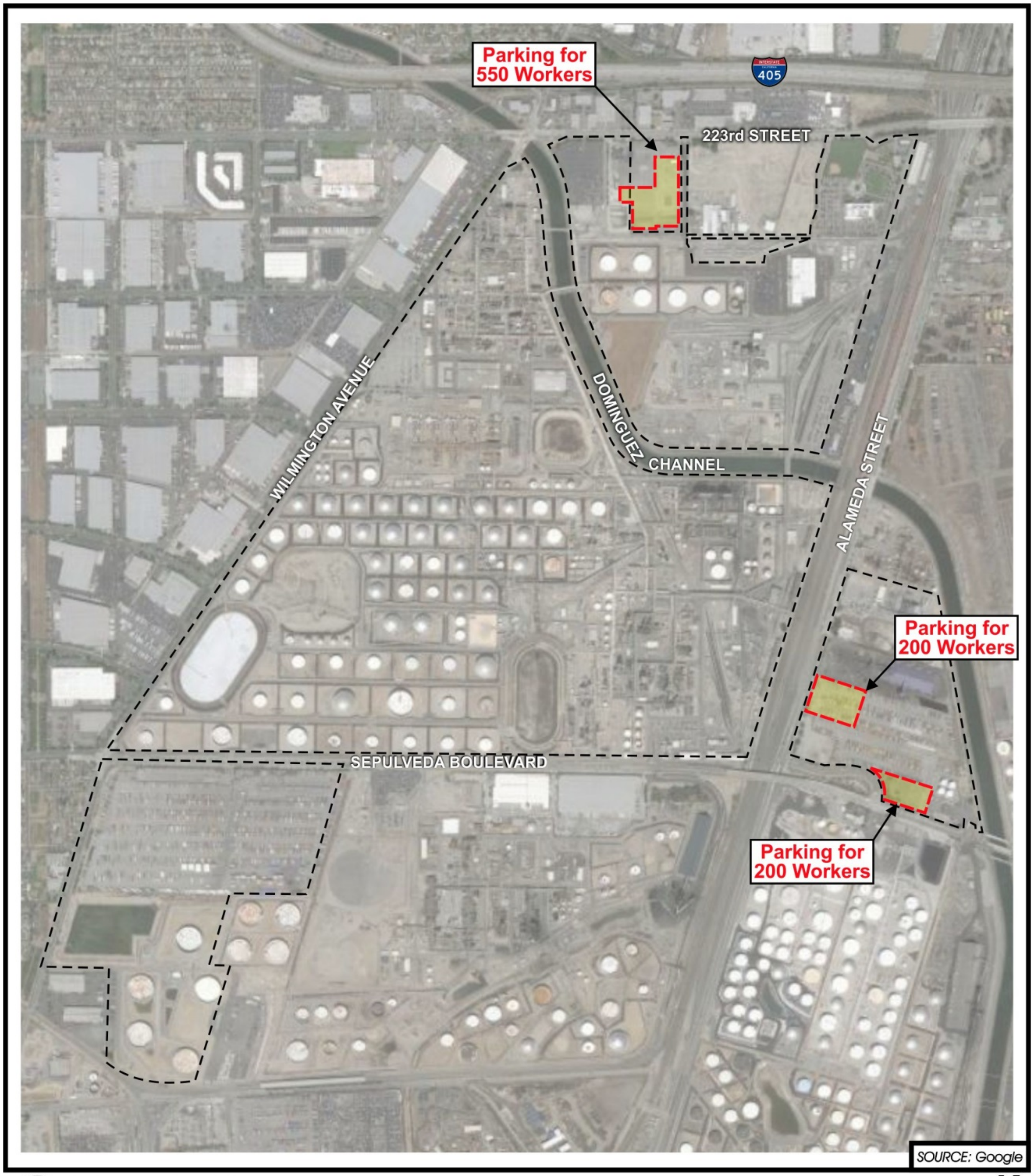

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FIGURE 2-19
PARKING MAP
TESORO LOS ANGELES REFINERY

Project No. 2844
N:\2844\ParkingMap.cdr

TABLE 2.10-1

Federal, State and Local Agency Discretionary Actions Needed for the Proposed Project

Agency Permit or Approval	Requirement	Applicability to Project
Federal		
None Required		
State		
None Required		
Local		
South Coast Air Quality Management District (SCAQMD)	Permits to Construct and Title V of the 1990 Clean Air Act.	SCAQMD Rule 201: Permit to Construct and Regulation XXX: Title V Permits. Applications are required to construct, operate or modify air emission sources.
	Permits to Operate	SCAQMD Rule 203: Permit to Operate. Applications are required to operate air emissions sources.
	California Environmental Quality Act (CEQA) Review	The SCAQMD is the lead agency for preparation of the environmental document (Public Resources Code § 21067).
	Standards for Approving Permits	SCAQMD Rule 212: Standards for Approving Permits. Permits cannot be issued if air contaminants create a public nuisance or exceed capacity limits. Also requires public notification of a significant project.
	Soil Contamination	SCAQMD Rule 1166: VOC Emissions from Decontamination of Soil. Requires the control of VOC emissions from soil remediation activities.
City of Carson	Conditional Use Permit	Required for new crude tanks at the Carson Crude Terminal.
	Right-of-Way	Required for new pipelines.
Alameda Corridor Transportation Authority	Right-of-Way	Required for pipelines under Alameda Corridor.

2.10.1 Federal Approvals

No discretionary federal agency approvals for the proposed project are expected to be required. Many of the U.S. Environmental Protection Agency (U.S. EPA) regulations and requirements are implemented by state or local agencies. For example, New Source Performance Standards are implemented by the SCAQMD and hazardous waste regulations are enforced by the California Department of Toxic Substances Control (DTSC). The Spill Prevention Control and Countermeasure (SPCC) Plan may require modifications to assure that all new and modified Refinery units are included in the Plan. The U.S. EPA also has authority over the Prevention of Significant Deterioration (PSD) Program and an applicability analysis to determine if PSD program permitting is required for the proposed modifications has been performed. The preliminary analysis concludes that PSD permitting will not be required for the proposed project.

The Occupational Safety and Health Administration (OSHA) regulates workplace hazards and enforces regulations that protect workers' health and safety. Under federal OSHA, regulations have been promulgated that require the preparation and implementation of a PSM Program (40 CFR Part 1910, Section 119, and Title 8 of the California Code of Regulations, Section 5189). The Refinery will be required to complete a PSM program to evaluate and minimize hazards associated with the proposed project. Finally, the U.S. Department of Transportation regulates the transportation of hazardous substances.

2.10.2 State Approvals

No discretionary state agency approvals for the proposed project are expected to be required. Construction-related permits may be required from the California Occupational Safety and Health Administration (CalOSHA) for demolition, construction, excavation, and tower and crane erection. Any transport of heavy construction equipment, which requires the use of oversized transport vehicles on state highways, will require a Caltrans transportation permit. The proposed project may require a Notice of Intent and preparation of a Stormwater Pollution Prevention Plan (Construction) under the statewide general stormwater NPDES permit from the State Regional Water Quality Control Board. DTSC regulates the generation, transport, treatment and disposal of hazardous wastes. Hazardous wastes generated by the proposed project activities and related to refining activities will be governed by rules and regulations enforced by DTSC. The existing PSM program and hazard communication program may require updating with CalOSHA due to the proposed project revisions.

2.10.3 Local Approvals

The SCAQMD has responsibility as lead agency for the CEQA process and for certification of the EIR because it has primary approval authority over the proposed project (CEQA Guidelines §15051(b)). Discretionary Permits to Construct/Operate for new equipment and modifications to existing units will be required. Certain components of the proposed project would also be subject to existing SCAQMD rules and regulations. Permits or plan approvals also may be required by SCAQMD Rule 1166 for soil remediation activities and demolition activities.

The LACSD and the County of Los Angeles Department of Public Works (LADPW) has responsibility for issuance of industrial wastewater discharge permits which are required for discharges into public sewers. No modifications are expected to be required to the Refinery's existing industrial wastewater discharge permits due to the proposed project.

The County of Los Angeles, Petro/Chemical Division, Fire Planning and Prevention Division is responsible for issuing ministerial permits for storage tanks and for review and approval of Risk Management Plans which will be required as part of the proposed project. The Fire Department also is responsible for assuring that the City fire codes are implemented. Ministerial building and grading permits for the proposed project will be required from the City of Carson and the

City of Los Angeles to assure that the proposed project complies with the ~~Uniform~~California Building Code.

CHAPTER 3

ENVIRONMENTAL SETTING

Introduction
Air Quality
Hazards and Hazardous Materials
Hydrology and Water Quality
Noise
Solid and Hazardous Waste
Transportation and Traffic

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3.0 ENVIRONMENTAL SETTING

3.1 INTRODUCTION

CEQA Guidelines §15125 requires that an EIR include a description of the environment within the vicinity of the proposed project as it exists at the time the NOP is published, or if no NOP is published, at the time the environmental analyses commences, from both a local and regional perspective. This chapter describes the existing environment in the vicinity of the Refinery that could be adversely affected by the proposed project. Information specifically regarding the environmental setting in the vicinity of the Refinery has been developed in this Draft EIR.

This EIR is focused only on the environmental topics identified in the NOP/IS (see Appendix A) that could be significantly adversely affected by the proposed project. The reader is referred to the NOP/IS for discussion of environmental topics not analyzed in this EIR, and the rationale for inclusion or exclusion of each environmental topic. The environmental topics identified in this chapter include both a regional and local setting.

3.2 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

3.2.1 METEOROLOGICAL CONDITIONS

The proposed project site is located within the Basin which consists of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. The climate in the Basin generally is characterized by sparse winter rainfall and hot summers tempered by cool ocean breezes. A temperature inversion, a warm layer of air that traps the cool marine air layer underneath it and prevents vertical mixing, is the prime factor that allows contaminants to accumulate in the Basin. The mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, and Santa Ana winds. The climate of the area is not unique, but the high concentration of mobile and stationary sources of air contaminants in the western portion of the Basin, in addition to the mountains, which surround the perimeter of the Basin, contribute to poor air quality in the region.

3.2.2 TEMPERATURE AND RAINFALL

Temperature affects the air quality of the region in several ways. Local winds are the result of temperature differences between the relatively stable ocean air and the uneven heating and cooling that takes place in the Basin due to a wide variation in topography. Temperature also has a major effect on vertical mixing height and affects chemical and photochemical reaction times. The annual average temperatures vary little throughout the Basin, averaging 75 degrees F. The coastal areas show little variation in temperature on a year round basis due to the moderating effect of the marine influence. On average, August is the warmest month while January is the coolest month. Most of the annual rainfall in the Basin falls between November and April. Annual average rainfall varies from nine inches in Riverside to 14 inches in downtown Los Angeles. Since 2011 the State of California has been in a period of extended drought. In 2011, downtown Los Angeles received 20.19 inches of rainfall. Since then, annual rainfall totals have dipped to 8.70 (2012), 5.93 2013), 6.04 (2014) inches. The city has received 8.46 (2015) inches to date, with the water year ending September 30 each year (NWS, 2015).

3.2.3 WIND FLOW PATTERNS

Wind flow patterns play an important role in the transport of air pollutants in the Basin. The winds flow from offshore and blow eastward during the daytime hours. In summer, the sea breeze starts in mid-morning, peaks at 10-15 miles per hour, and subsides after sundown. There is a calm period until about midnight. At that time, the land breeze begins from the northwest, typically becoming calm again about sunrise. In winter, the same general wind flow patterns exist except that summer wind speeds average slightly higher than winter wind speeds. This pattern of low wind speeds is a major factor that allows pollutants to accumulate in the Basin.

The normal wind patterns in the Basin are interrupted by the unstable air accompanying the passing storms during the winter and infrequent strong northeasterly Santa Ana wind flows from the mountains and deserts north of the Basin.

3.2.4 EXISTING AIR QUALITY

Local air quality in the Basin is monitored by the SCAQMD, which operates a network of monitoring stations throughout the Basin. CARB operates additional monitoring stations.

3.2.4.1 Criteria Pollutants

The sources of air contaminants in the Basin vary by pollutant but generally include on-road mobile sources (e.g., automobiles, trucks and buses), off-road mobile sources (e.g., airplanes, ships, trains, construction equipment, etc.), residential/commercial sources, and industrial/manufacturing sources. Mobile sources are responsible for a large portion of the total Basin emissions of several pollutants.

Mobile sources represent 59 percent of VOC emissions, 88 percent of NOx emissions, and 75 percent of SOx emissions. For directly emitted PM2.5, mobile sources represent 40 percent of the emissions with an additional 10 percent due to vehicle-related entrained road dust (SCAQMD, 2013a).

Criteria air pollutants are those pollutants for which the federal and state governments have established ambient air quality standards or criteria for outdoor concentrations in order to protect public health with a margin of safety (see Table 3.2-1). NAAQS were first authorized by the federal Clean Air Act of 1970 and have been set by the U.S. EPA. California Ambient Air Quality Standards (CAAQS) were authorized by the state legislature in 1967 and have been set by CARB. Air quality of a region is considered to be in attainment of the standards if the measured concentrations of air pollutants are maintained at equal to or less than the standards. Both the NAAQS and the CAAQS are periodically revisited and revised based on the most recent scientific information.

TABLE 3.2-1

Ambient Air Quality Standards

Air Pollutant	State Standard Concentration/ Averaging Time	Federal Primary Standard Concentration/ Averaging Time	Most Relevant Health Effects
Ozone (O_3)	0.09 ppm, 1-hr. avg. 0.070 ppm, 8-hr	0.070 ppm, 8-hr avg.	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage
Carbon Monoxide (CO)	20 ppm, 1-hr avg. 9.0 ppm, 8-hr avg.	35 ppm, 1-hr avg. 9 ppm, 8-hr avg.	(a) Aggravation of angina pectoris and other coronary heart disease; (b) Decreased exercise tolerance in persons with vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
Nitrogen Dioxide (NO_2)	0.18 ppm, 1-hr avg. 0.03 ppm, ann. avg.	0.100 ppm, 1-hr avg.[a] 0.053 ppm, ann. avg.	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
Sulfur Dioxide(SO_2)	0.25 ppm, 1-hr. avg. 0.04 ppm, 24-hr avg.	75 ppb, 1-hr avg.[b] 0.5 ppm, 3-hr avg. (secondary)	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
Suspended Particulate Matter (PM10)	50 µg/ m^3, 24-hr avg. 20 µg/m^3, ann. arithmetic mean	150 µg/ m^3, 24-hr avg.	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function in children
Suspended Particulate Matter (PM2.5)	12 µg/ m^3, ann. Arithmetic mean	35 µg/ m^3, 24-hr avg. 12.0 µg/ m^3, annual arithmetic mean	Decreased lung function from exposures and exacerbation of symptoms in sensitive patients with respiratory disease; elderly; children.
Sulfates	25 µg/ m^3, 24-hr avg.	Not applicable	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	1.5 µg/ m^3, 30-day avg.	1.5 µg/ m^3, calendar quarter 0.15 µg/ m^3, rolling 3-month avg.	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	In sufficient amount to give an extinction coefficient >0.23 inverse kilometers (visual range to less than 10 miles) with relative humidity less than 70%, 8-hour average (10 a.m. – 6 p.m. PST)	Not applicable	Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent
Hydrogen Sulfide	0.03 ppm, 1-hr avg.	Not applicable	Breathing H2S at levels above the standard will result in exposure to a very disagreeable odor.
Vinyl Chloride	0.01 ppm, 24-hour avg.	Not applicable	Short-term exposure to high levels of vinyl chloride in air causes central nervous system effects, such as dizziness, drowsiness, and headaches. Long-term exposure to vinyl chloride through inhalation and oral exposure causes in liver damage. Cancer is a major concern from exposure to vinyl chloride via inhalation. Vinyl chloride exposure has been shown to increase the risk of angiosarcoma, a rare form of liver cancer in humans.

Footnotes:

a) To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm.

b) Based on the 3-year average of the 99th percentile of the 1-hour daily maximum concentrations.

Health-based air quality standards have been established by the U.S. EPA and CARB for ozone (O_3), CO, nitrogen dioxide (NO_2), PM10, PM2.5, sulfur dioxide (SO_2), and lead. The California standards are equivalent to or more stringent than the federal air quality standards. California also has established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride. Hydrogen sulfide and vinyl chloride currently are not monitored in the Basin because they are not a regional air quality problem, but are generally associated with localized emission sources.

As shown in Table 3.2-2, the Basin is designated as non-attainment for PM2.5 and ozone for both state and federal standards. The Basin, including the proposed project area, is classified as attainment for both the state and federal standards for NO_2 (except the federal 1-hr standard is unclassifiable/attainment), SO_2, CO, sulfates, and lead (except in Los Angeles County) and is classified as attainment for the federal PM10 standards but non-attainment for the state PM10 standards and lead in Los Angeles County.

3.2.4.2 Regional Air Quality

The SCAQMD monitors levels of various criteria pollutants at 38 monitoring stations located throughout the SCAQMD's entire area of jurisdiction, hereafter referred to as the district. Based on the most recent monitoring data published for 2014, the district exceeded the federal and state standards for ozone at most monitoring locations on one or more days. The federal one-hour ozone standard was revoked and replaced by the eight-hour average ozone standard effective June 15, 2005. The state one-hour ozone standard was exceeded in the Basin 74 days in 2014. The Central San Bernardino Mountains and the East San Bernardino Valley exceeded standards most frequently. Other areas that exceeded the state ozone standards included the San Gabriel Valley, San Fernando Valley, Santa Clarita Valley, and Riverside County including the Coachella Valley. The federal and state eight-hour ozone standards were exceeded on 92 and 129 days in the Basin, respectively in 2014 (SCAQMD, 2015).

In 2014, the state and federal maximum concentrations of CO were not exceeded in the Basin. Because of improving CO air quality over the last several years, in 2005 the SCAQMD adopted and submitted to U.S. EPA a CO attainment re-designation request and CO maintenance plan. U.S. EPA declared the Basin as a maintenance area for CO in 2007 (SCAQMD, 2015).

The federal PM10 standards were not exceeded in the Basin in 2014. Because of improving PM10 air quality over the last several years, in 2010 the SCAQMD adopted and submitted to the U.S.EPA a PM10 attainment re-designation request and PM10 maintenance plan. U.S. EPA declared the Basin as a maintenance area for PM10 on June 26, 2013. The state PM10 standards were exceeded at many of the monitoring locations in the Basin including central and coastal Los Angeles County, San Fernando Valley, San Gabriel Valley, Orange County, Riverside County, the Coachella Valley, and San Bernardino County. The state PM10 standard was exceeded 44 times in the Basin in 2014. The federal PM2.5 standard was exceeded 15 times in 2014.

TABLE 3.2-2

National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) Attainment Status for South Coast Air Basin

Criteria Pollutant	Standard	Averaging time	Designation [a]
1979 1-Hour O_3 [b]	Federal	1-Hour (0.12 ppm)	Nonattainment (Extreme)
1-Hour O_3	State	1-Hour (0.09 ppm)	Nonattainment
1997 8-Hour O_3 [c]	Federal	8-Hour (0.08 ppm)	Nonattainment (Extreme)
2008 8-Hour O_3	Federal	8-Hour (0.075 ppm)	Nonattainment (Extreme)
2015 8-Hour O_3	Federal	8-Hour (0.070 ppm)	Designations Pending
8-Hour O_3	State	8-Hour (0.070 ppm)	Nonattainment
CO	Federal	1-Hour (35 ppm) 8-Hour (9 ppm)	Attainment (Maintenance)
	State	1-Hour (20 ppm) 8-Hour (9 ppm)	Attainment
NO_2 [d]	Federal	1-Hour (0.10 ppm)	Unclassifiable/Attainment
	Federal	Annual (0.053 ppm)	Attainment (Maintenance)
	State	1-Hour (0.18 ppm) Annual (0.030 ppm)	Attainment
PM10	Federal	1987 24-hour (150 μg/m^3)	Attainment (Maintenance) [f]
	State	24-hour (50 μg/m^3) Annual (20 μg/m^3)	Nonattainment
PM2.5 [g]	Federal	2006 24-Hour (35 μg/m^3)	Nonattainment (Serious)
	Federal	1997 Annual (15.0 μg/m^3)	Nonattainment
	Federal	2012 Annual (12.0 μg/m^3)	Nonattainment (Serious)
	State	Annual (12.0 μg/m^3)	Nonattainment
SO_2 [e]	Federal	1-Hour (75 ppb)	Designations Pending (expect Uncl./Attainment)
	Federal	24-Hour (0.14 ppm) Annual (0.03 ppm)	Unclassifiable/Attainment
Lead	Federal	3-Months Rolling (0.15 μg/m^3)	Nonattainment (Partial) [h]

[a] U.S. EPA often only declares Nonattainment areas; everywhere else is listed as Unclassifiable/Attainment or Unclassifiable.

[b] 1-hour O_3 standard (0.12 ppm) was revoked, effective June 15, 2005; however, the Basin has not attained this standard based on 2008-2010 data and has some continuing obligations under the former standard.

[c] 1997 8-hour O_3 standard (0.08 ppm) was reduced (0.075 ppm), effective May 27, 2008; the 1997 O_3 standard and most related implementation rules remain in place until the 1997 standard is revoked by U.S. EPA.

[d] New NO_2 1-hour standard, effective August 2, 2010; attainment designations January 20, 2012; annual NO_2 standard retained.

[e] The 1971 annual and 24-hour SO_2 standards were revoked, effective August 23, 2010; however, these 1971 standards will remain in effect until one year after U.S. EPA promulgates area designations for the 2010 SO_2 1-hour standard. Area designations are still pending, with Basin expected to be designated Unclassifiable /Attainment.

[f] Annual PM10 standard was revoked, effective December 18, 2006; 24-hour PM10 NAAQS deadline was 12/31/2006; SCAQMD request for redesignation and PM10 maintenance plan was approved by U.S. EPA on June 26, 2013, effective July 26, 2013.

[g] Attainment deadline for the 2006 24-Hour PM2.5 NAAQS is December 31, 2015 based on Subpart 4. Annual PM2.5 standard was revised on January 15, 2013, effective March 18, 2013, from 15 to 12 μg/m^3. Designation for Basin is moderate nonattainment effective April 15, 2015, so attainment deadline is December 31, 2021 (end of the 6th calendar year after effective date of designation).

[h] Partial Nonattainment designation – Los Angeles County portion of Basin only for near-source monitors. Expect to remain in attainment based on current monitoring data.

In 2014, neither federal nor state standards for NOx, SOx, CO, lead, and sulfates were exceeded. Currently, the district is in attainment with the ambient air quality standards for NOx, SOx, CO, and lead (SCAQMD, 2015).

3.2.4.3 Local Air Quality

The project site is located within the SCAQMD's South Coastal Los Angeles County monitoring area. Prior to 2011, South Coastal Los Angeles County 1 Monitoring Stations No. 072 and No. 77 were the closest stations to the Refinery. In 2011, the South Coast Los Angeles County 3 Monitoring Station No. 33 was established that is closer and more representative of the local air quality in the vicinity of the Refinery (see Figure 3.2-1). Background air quality data for the years 2009 through 2014 for criteria pollutants for the South Coastal Los Angeles County Monitoring Stations No. 072, 77, and 33 are presented in Table 3.2-3. The area has shown a general improvement in air quality with decreasing or consistent concentrations of most pollutants. Air quality in the South Coastal Los Angeles County Monitoring Station No. 072, 77, and 33 monitoring area complies with the state and federal ambient air quality standards for CO, NOx, SOx, PM10, lead, and sulfate. The air quality in the area is also in compliance with the federal eight-hour and state one-hour ozone standards. The air quality in the South Coastal Los Angeles County Monitoring Station No. 072, 77, and 33 area is not in compliance with the state annual PM10 standard. The air quality in the South Coastal Los Angeles County Monitoring Station No 072, 77, and 33 is not in compliance with the state or federal PM2.5 standards.

TABLE 3.2-3

South Coastal Los Angeles County 1 Monitoring Stations No. 072, 33, and 77 (2009-2014) Maximum Observed Concentrations

Constituent		2009	2010	2011[a]	2012[a]	2013[a]	2014[a]
O_3:	1-Hour (ppm)	0.089	0.101	0.074	0.08	0.090	0.087
	Days Exceeding Federal Standard	(0)	(0)	(0)	(0)	(0)	
	Days Exceeding State Standard	(0)	(1)	(0)	(0)	(0)	(0)
	8-Hour (ppm)	0.068	0.084	0.063	0.066	0.069	0.072
	Days Exceeding Federal Standard	(0)	(1)	(0)	(0	(0)	(0)
	Days Exceeding State Standard	(0)	(1)	(0)	(0)	(0)	(1)
CO [b]:							
	1-Hour (ppm)	3	3	(--)	(--)	(--)	4
	8-Hour (ppm)	2.2	2.1	3.3	2.6	2.6	2.6
NO_2 [c]:							
	1-Hour (ppm)	0.11	0.0928*	0.0900	0.0978*	0.0813	0.1359
	Annual (ppm)	0.0212	0.0198*	0.0212	0.0253*	0.0215	.0207
PM10 [d, e]:	24-Hour (μg/m^3)	62	44	50	54	54	59
	Percent of Samples Exceeding Federal Standard	(0)	(0)	(0)	(0)	(0)	(0)
	Percent of Samples Exceeding State Standard	(5.3%)	(0%)	(0%)	(1.7%)	(2%)	(3.4%)
	Annual [f] (μg/m^3) (arithmetic mean)	30.5	22.0	28.7	25.5	27.3	26.6

TABLE 3.2-3 (concluded)

Constituent		2009	2010	2011[(a)]	2012[(a)]	2013[(a)]	2014[(a)]
PM2.5 [(e, g)]:	24-Hour ($\mu g/m^3$)	63.0	35.0	42.0	46.7	42.9	52.2
	Percent of Samples Exceeding Federal Standard	(1.8%)	(0%)	(0.9%)	(1.2%)	(0.3%)	(0.6%)
	Annual Arithmetic Mean ($\mu g/m^3$)	13.0	10.5	43.9	10.57	10.97	10.72
SO_2 [(h)]:							
	1-Hour (ppm)	0.02	0.040	0.0433	0.0227	0.0151	0.0147
	24-Hour (ppm)	0.005	0.006	(--)	(--)	(--)	(--)
	Annual Arithmetic Mean (ppm)	(--)	(--)	(--)	(--)	(--)	(--)
Lead [(i)]:	30-Day ($\mu g/m^3$)	0.01	0.01	0.009	0.007	0.012	0.012
	Quarter ($\mu g/m^3$)	0.01	0.01	0.009	0.005	0.009	0.01
Sulfate [(j)]:	24-Hour ($\mu g/m^3$)	13.6	11.8	5.9	4.9	4.8	4.5
	State Standard	(0%)	(0%)	(--)	(--)	(--)	(--)

Source: SCAQMD Air Quality Data Annual Summaries 2009-2014.

Notes: (%) = Percent of samples exceeding the federal or state standard, (--) = Pollutant not monitored, ppm = parts per million of air by volume, AAA = Annual Arithmetic Mean, $\mu g/m^3$ = micrograms per cubic meter. -- = Pollutant not monitored, * = Less than 12 months of data

(a) Years 2009-2010 all data are from station 072. For Years 2011-2014, monitoring data are for Station 033 for O_3, CO, NO_2, and SO_2 and Station 077 for PM10, PM2.5, Lead, and Sulfate. Station 033 was introduced in 2011 and is geographically closer to the Refinery; however, PM10, PM2.5, Lead, and Sulfate are not reported. Therefore, Station 077 data has been reported.

(b) The federal 8-hour standard (8-hour average CO > 9 ppm) and state 8-hour standard (8-hour average CO > 9.0 ppm) were not exceeded. The federal and state 1-hour standards (35 ppm and 20 ppm) were not exceeded either.

(c) The NO_2 federal 1-hour standard is 100 ppb and the annual standard is annual arithmetic mean NO_2 > 0.0534 ppm (53.4 ppb). The state 1-hour and annual standards are 0.18 ppm (180 ppb) and 0.030 ppm (30 ppb). Values shown in the table are based on the form of the Federal 1-hour standard (i.e., the 98th percentile averaged over three years).

(d) Federal Reference Method (FRM) PM10 samples were collected every 6 days at all sites except for Stations 4144 and 4157, where samples were collected every 3 days. PM10 statistics listed above are for the FRM data only. Federal Equivalent Method (FEM) PM10 continuous monitors were operated at some of the above locations. Max 24-hour average PM10 at sites with FEM monitoring was 142 $\mu g/m^3$, at Palm Springs in Coachella Valley. The FEM Basin's max was 104 $\mu g/m^3$ at Mira Loma.

(e) High PM10 and PM2.5 data samples excluded in accordance with the U.S. EPA Exceptional Event Regulation are as follows: PM10 (FEM) data recorded on August 9 (270 $\mu g/m^3$) and January 21 (207 $\mu g/m^3$) both at Indio; PM2.5 (FRM) at Azusa (39.6 $\mu g/m^3$) and Fontana (39.9 $\mu g/m^3$), both recorded on July 5.

(f) Federal annual PM10 standard (AAM > 50 $\mu g/m^3$) was revoked in 2006. State standard is annual average (AAM) > 20 $\mu g/m^3$

(g) PM2.5 samples were collected every 3 days at all sites except for station numbers 069, 072, 077, 087, 3176, 4144 and 4165, where samples were taken daily, and station number 5818 where samples were taken every 6 days. PM2.5 statistics listed above are for the FRM data only. FEM PM2.5 continuous monitoring instruments were operated at some of the above locations. Max 24-hour average PM2.5 concentration recorded at FEM sites was 79.0 $\mu g/m^3$ at Central LA. U.S. EPA has revised the annual PM2.5 standard from annual average (AAM) 15.0 $\mu g/m^3$ to 12.0 $\mu g/m^3$, effective March 18, 2013. State standard is annual average (AAM) > 12.0 $\mu g/m^3$.

(h) The federal SO_2 1-hour standard is 75 ppb (0.075 ppm). The state standards are 1-hour average SO_2 > 0.25 ppm (250 ppb) and 24-hour average SO_2 > 0.04 ppm (40 ppb).

(i) Federal lead standard is 3-months rolling average > 0.15 $\mu g/m^3$; state standard is monthly average ≥1.5 $\mu g/m^3$. Lead statistics listed above are for population-oriented sites only; standards were not exceeded at any of these sites.

(j) State sulfate standard is 24-hour ≥25 $\mu g/m^3$. There is no federal standard for sulfate.

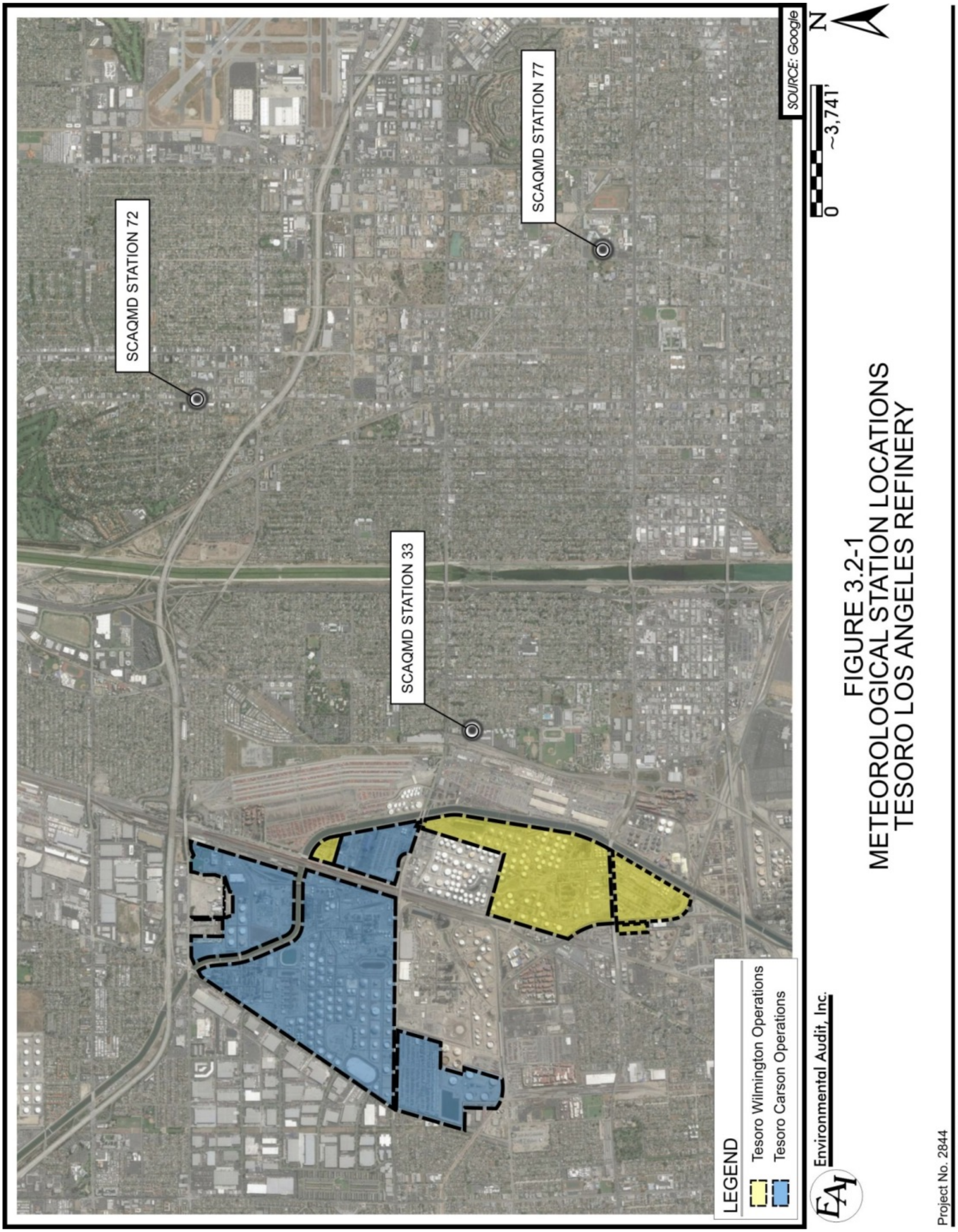

FIGURE 3.2-1
METEOROLOGICAL STATION LOCATIONS
TESORO LOS ANGELES REFINERY

3.2.4.4 Tesoro Los Angeles Refinery Criteria Pollutant Emissions

Operation of the existing Refinery results in the emissions of criteria pollutants. The reported emissions of criteria air pollutants from Refinery equipment subject to SCAQMD permit requirements for the 2012 – 2013 monitoring period are shown in Table 3.2-3. Emissions data in Table 3.2-4 represent annual emissions. It should be noted that because Refinery operations fluctuate based on market demand for products, operating conditions of individual equipment, equipment shutdowns, etc., operational emissions may fluctuate widely on a daily basis.

TABLE 3.2-4

Tesoro Los Angeles Refinery
Reported Criteria Pollutant Emissions (tons/year)

Facility	SCAQMD ID#	CO	VOC	NOx	SOx	PM10
2012						
Carson Refinery	131003	671	500	650	418	367
Wilmington Refinery	800436	574	200	576	186	271
Carson Crude Terminal	132124	0.02	10	0.2	0.0	0.01
Wilmington Truck Terminal	167981	7	22	8	0.2	0.4
Wilmington SRP	151798	149	29	43	9	33
Marine Terminal #1	132137	--	--	--	--	--
Marine Terminal #2	132121	--	--	--	--	--
Marine Terminal #3	174689	--	--	--	--	--
Total		**1,401**	**761**	**1,277**	**613**	**671**
2013						
Carson Refinery	174655	609	560	698	509	361
Wilmington Refinery	800436	586	281	653	175	265
Carson Crude Terminal	174694	0.2	10	0.3	0.0	0.01
Wilmington Truck Terminal	167981	11	12	9	0.4	0.3
Wilmington SRP	151798	145	29	49	7	32
Marine Terminal #1	176389	--	--	--	--	--
Marine Terminal #2	176377	0.7	19	2	0.01	0.1
Marine Terminal #3	176369	0.6	5	0.8	0.004	0.06
Total		**1,353**	**916**	**1,412**	**691**	**658**

Source SCAQMD, 2014a
(a) Baseline emissions are based on the annual emission fee reports prepared for the SCAQMD during the appropriate reporting periods (2012 and 2013).
(--) No Data Available

The Refinery is regulated under the Regional Clean Air Incentives Market (RECLAIM) Program for NOx and SOx. The Refinery has been in the RECLAIM program since its inception in January 1994 and receives an annual allocation of RECLAIM trading credits (RTCs), which has and will continue to decline over time. Annually, the Refinery must relinquish NOx and SOx RTCs equal to the annual emissions from the Refinery. When the allocation is insufficient to cover the required emissions, as is the case as of the date of this FEIR~~today~~, RTCs are purchased from the RTC credit market.

3.2.4.5 Toxic Air Contaminants

The California Health and Safety Code (§39655) defines a TAC as an air pollutant which may cause or contribute to an increase in mortality, an increase in serious illness, or which may pose a present or potential hazard to human health. Under California's toxic air contaminant program (Assembly Bill (AB) 1807, Health and Safety Code §39650 et seq.), CARB, with the participation of the local air pollution control districts, evaluates and develops any needed control measures for air toxics. The general goal of regulatory agencies is to limit exposure to toxic air contaminants to the maximum extent feasible.

Monitoring for TACs is limited compared to monitoring for criteria pollutants because toxic pollutant impacts are typically more localized than criteria pollutant impacts. CARB conducts air monitoring for a number of TACs every 12 days at approximately 20 sites throughout California. The West Long Beach station is the TAC monitoring station closest to the proposed project. A summary of the data from the West Long Beach station for various TACs is considered to be an appropriate estimate of the TAC concentration in the vicinity of the proposed project (see Table 3.2-5).

The SCAQMD measures TAC concentrations as part of its ongoing Multiple Air Toxics Exposure Study (MATES). The purpose of the studies is to provide an estimate of exposure to TACs by individuals within the Basin. The SCAQMD recently concluded a fourth MATES, referred to as MATES IV, that includes monitoring for 37 TACs at ten fixed monitoring sites within the Basin in neighborhoods near known toxic emission sources or in areas where environmental justice concerns have been raised. In addition to the 10 fixed sites, two mobile monitoring platforms were deployed that focused on local scale studies at locations for short time periods. These mobile monitoring platforms were specifically designed for fast response deployment in communities of the Basin. Also included in the study is computer modeling to estimate air toxic levels throughout the Basin.

The 2012-2013 Basin average population-weighted risk summed for all the toxic components yielded a cancer risk of 367 in one million, as compared to the MATES III Basin average risk of 853 per million when using the same risk assessment methodology from OEHHA. This means that 367 people out of one million are susceptible to contracting cancer from exposure to the known TACs over a 70-year period of time. Thus, the modeled risk decreased by 57 percent, primarily attributed to the changes in diesel emissions between 2005 and 2012. OEHHA recently updated its risk assessment methodology, primarily to take into account recent scientific findings regarding children's increased susceptibility to contracting cancer from environmental exposures. This methodology change causes a roughly two to threefold increase in risk given the same level of exposure. For the MATES IV study, the population-weighted risk increases to 897 in one million using this new methodology on data collected in 2012-2013. Diesel particulate continues to be responsible for the largest contribution to cancer risk from air toxics. The next three highest contributors include benzene, hexavalent chromium, and 1,3-butadiene (SCAQMD, 2015a). The best available ambient monitoring TAC data is for 24-hour concentrations, because SCAQMD does not take one-hour TAC measurements. The best approximation of the acute hazard index for the West Long Beach station is 0.242 (see Table 3.2-5), for illustrative purposes.

TABLE 3.2-5

Ambient Air Quality
Toxic Air Contaminants – West Long Beach
Peak 24-Hour Concentration 2012-2013

Pollutant	Peak 24-hour Concentration	Acute REL	Acute HI	Pollutant	Peak 24-hour Concentration	Acute REL	Acute HI
VOCs	ppbv ($\mu g/m^3$)	($\mu g/m^3$)			ppbv ($\mu g/m^3$)	($\mu g/m^3$)	
Acetaldehyde	2.79 (5.03)	470	0.011	Formaldehyde	4.06 (4.99)	550	0.009
Acetone	9.93 (23.59)	--	--	MEK	0.47 (1.39)	13000	0.000
Benzene	1.17 (3.74)	27	0.138	Methylene Chloride	13.59 (47.21)	14000	0.003
1,3-Butadiene	0.32 (0.71)	660	0.001	Perchloroethylene	0.07 (0.47)	20000	0.000
Carbon Tetrachloride	0.11 (0.69)	1900	0.000	Styrene	0.32 (1.36)	21000	0.000
Chloroform	0.06 (0.29)	150	0.002	Toluene	3.58 (13.49)	37000	0.000
1,4-Dichlorobenzene	0.02 (0.12)	--	--	Trichloroethylene	0.07 (0.38)	--	--
1,2-Dichloroethane	0.05 (0.20)	--	--	Meta/para-Xylene	2.53 (10.99)	22000	0.000
Ethyl Benzene	0.73 (3.17)	--	--	ortho-Xylene	0.86 (3.73)	22000	0.000
Inorganic compounds	ng/m^3 ($\mu g/m^3$)				ng/m^3 ($\mu g/m^3$)		
Antimony	11.40 (0.01)	--	--	Manganese	61.70 (0.06)	--	--
Arsenic	1.46 (0.00)	0.2	0.007	Molybdenum	7.35 (0.01)	--	--
Barium	159.00 (0.16)	--	--	Nickel	13.00 (0.01)	0.2	0.065
Beryllium	0.09 (0.00)	--	--	Potassium	1,920 (1.92)	--	--
Cadmium	0.42 (0.00)	--	--	Rubidium	4.48 (0.00)	--	--
Calcium	4,640 (464)	--	--	Selenium	5.19 (0.01)	--	--
Cesium	0.23 (0.00)	--	--	Strontium	56.00 (0.06)	--	--
Chromium	8.83 (0.01)	--	--	Tin	8.63 (0.01)	--	--
Cobalt	3.70 (0.00)	--	--	Titanium	324.00 (0.32)	--	--
Copper	251.00 (0.25)	100	0.003	Uranium	0.29 (0.00)	--	--
Hexavalent Chromium	3.70 (0.00)	--	--	Vanadium	18.00 (0.02)	30	0.001
Iron	5,730 (5.73)	--	--	Zinc	225.00 (0.23)	--	--
Lead	43.30 (0.04)	--	--	**Total Acute HI**			0.242

Source: SCAQMD, 2015a. MATES-IV Final Report, May 2015
Notes: ppbv = parts per billion by volume; ng/m3 = nanograms per cubic meter, MEK = methyl ethyl ketone
-- = no acute reference exposure level (REL) established, Acute HI = Acute Hazard Index

3.2.4.6 Climate Change

Global climate change is a change in the average weather of the earth, which can be measured by wind patterns, storms, precipitation, and temperature. Historical records have shown that temperature changes have occurred in the past, such as during previous ice ages. Some data indicate that the current temperature record differs from previous climate changes in rate and magnitude.

The United Nations Intergovernmental Panel on Climate Change constructed several emission projections which attempted to estimate quantities of global greenhouse gases that, if stayed at or below, would potentially result in stabilization of global temperatures, with the intent of minimizing global climate change impacts from human activities. It concluded that a stabilization of GHGs at 400 to 450 ppm carbon dioxide-equivalent concentration is required to keep global mean warming below two degrees Celsius, which is assumed to be necessary to avoid additional climate change.

Potential health effects from global climate change may arise from temperature increases, climate-sensitive diseases, extreme events, and air quality. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and less extreme cold spells. Those living in warmer climates are likely to experience more stress and heat-related problems (i.e., heat rash and heat stroke). In addition, climate sensitive diseases may increase, such as those spread by mosquitoes and other disease carrying insects. Those diseases include malaria, dengue fever, yellow fever, and encephalitis. Extreme events such as flooding and hurricanes can displace people and agriculture, which would have negative consequences. Drought in some areas may increase, which would decrease water and food availability. Global climate change may also exacerbate air quality problems from increased frequency of exceeding criteria pollutant ambient air quality standards.

The impacts of global climate change will also affect projects in various ways. Adverse effects of climate change, such as rising sea levels and changes in snow pack, are specifically mentioned in Assembly Bill 32 (AB32) the Global Warming Solutions Act of 2006. The extent of climate change impacts at specific locations remains unclear. However, it is expected that California agencies will more precisely quantify impacts in various regions of the State. As an example, it is expected that the California Department of Water Resources will formalize a list of foreseeable water quality issues associated with various degrees of climate change. Once state government agencies make these lists available, they could be used to more precisely determine to what extent a project contributes to global climate change impacts. Due to the global nature of the effects of GHGs, GHG impacts are discussed in Chapter 5 – Cumulative Impacts.

Table 3.2-6 presents the GHG emission inventory by major source categories in calendar year 2008, as identified in the 2012 AQMP, for the Basin. The emissions reported herein are based on in-Basin energy consumption and do not include out-of-Basin energy production (e.g., power plants, crude oil production) or delivery emissions (e.g., natural gas pipeline loss). Three major greenhouse gas pollutants have been included: carbon dioxide (CO_2), nitrous oxide (N_2O), and CH_4. Using CO_2 as a standard, GHG emissions are reported in million metric tons of CO_2 equivalent ($MMTCO_2e$.) Mobile sources generate 59.4 percent of the total GHG emissions in the Basin (47.0 percent from on-road vehicles and 12.4 percent from other mobile sources (aircraft, as trains, ships and boats, and other sources (construction equipment, airport equipment, oil and gas drilling equipment)). The remaining 40.6 percent of the total Basin GHG emissions are from stationary and area sources.

Fuel combustion is the largest contributor to stationary/area source GHG emissions, accounting for 68.6 percent of all the GHG emissions from the stationary/area source category. Fuel combustion from the stationary/area source category accounts for 27.8 percent of the total GHG emissions in the Basin.

3.2.5 REGULATORY BACKGROUND

Ambient air quality standards in California are the responsibility of, and have been established by, both the U.S. EPA and CARB. These standards have been set at concentrations, which provide margins of safety for the protection of public health and welfare. Federal and state air quality standards are presented in Table 3.2-1. The SCAQMD has established levels of episode criteria and has indicated measures that must be initiated to immediately reduce criteria pollutant and air toxics emissions when these levels are reached or exceeded. The federal, state, and local air quality regulations are identified below in further detail.

3.2.5.1 Federal Regulations

The U.S. EPA is responsible for setting and enforcing the National Ambient Air Quality Standards for oxidants (ozone), CO, NOx, SOx, PM10, PM2.5, and lead. The U.S. EPA has jurisdiction over emissions sources that are under the authority of the federal government including aircraft, locomotives, and emissions sources outside state waters (Outer Continental Shelf). The U.S. EPA also establishes emission standards for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission requirements of the CARB.

In 1990, the amendments to the federal CAA conditionally required states to implement programs in federal CO non-attainment areas to require gasoline to contain a minimum oxygen content in the winter beginning in November 1992. In response to the federal CAA requirements to reduce CO emissions, California established a wintertime oxygenate gasoline program requiring between 1.8 and 2.2 weight percent oxygen content in gasoline.

Other federal regulations applicable to the proposed project include Title III of the Clean Air Act, which regulates toxic air contaminants. Title V of the Act establishes a federal permit program for large stationary emission sources. The Refinery has submitted its Title V permit application and the proposed project will require modifications to the Title V application and/or operating permit. The Title V program is implemented by the SCAQMD in the southern California area. The U.S. EPA also has authority over the PSD program; however, the proposed project will not require a PSD permit.

TABLE 3.2-6
2008 GHG Emissions for the Basin

Source Category	Emissions						
	CO_2	N_2O	CH_4	CO_2	N_2O	CH_4	CO_2e
	(TPD)			(TPY)			(MMT)
Fuel Combustion							
Electric Utilities	34,303	0.08	0.71	12,520,562	29.0	258	11.4
Cogeneration	872	0.00	0.02	318,340	0.60	6.00	0.29
Oil and Gas Production (Combustion)	2,908	0.01	0.08	1,061,470	4.71	29.5	0.96
Petroleum Refining (Combustion)	44,654	0.06	0.57	16,298,766	20.7	207	14.8
Manufacturing and Industrial	22,182	0.06	0.48	8,096,396	20.9	174	7.35
Food and Agricultural Processing	927	0.00	0.02	338,516	0.84	7.16	0.31
Service and Commercial	21,889	0.08	0.59	7,989,416	30.8	215	7.26
Other	2,241	0.02	0.16	818,057	8.58	58	0.75
Total Fuel Combustion	**129,977**	**0.32**	**2.62**	**47,441,523**	**116**	**956**	**43.1**
Petroleum Production and Marketing							
Oil and Gas Production	92.1	0.00	0.92	33,605	0.06	336	0.04
Petroleum Refining	770	0.00	1.65	280,932	0.36	603	0.27
Petroleum Marketing	0	0.00	83.8	0	0.00	30,598	0.58
Other	0	0.00	0.00	0	0.00	0	0.00
Total Petroleum Production and Marketing	**862**	**0.00**	**86.4**	**314,536**	**0.42**	**31,537**	**0.89**
Other Source Categories							
Total Waste Disposal[(b)]	3,772	0.04	508	1,376,870	14.9	185,278	4.78
Total Cleaning and Surface Coatings[(c)]	2,648	0.00	0.33	966,628	1.22	122	0.88
Total Industrial Processes[(d)]	279	0.00	1.49	101,832	0.19	543	0.10
Total Solvent Evaporation[(e)]	0.00	0.00	0.07	0.00	0.00	24.20	0.00
Total Miscellaneous Processes[(f)]	38,850	0.12	27.9	14,180,326	45.3	10,179	13.1
Total On-Road Motor Vehicles[(g)]	217,480	6.11	8.26	79,380,188	155	187	72.7
Total Other Mobile Sources[(h)]	57,572	1.83	8.95	21,013,816	668	3,268	19.3
Total Other Source Categories	**320,601**	**8.10**	**555**	**117,019,660**	**885**	**199,601**	**111**
Total 2008 Baseline GHG Emissions for Basin	**451,440**	**8.42**	**644**	**164,775,719**	**1,001**	**232,094**	**155**

Source: (SCAQMD, 2013a)

(a) MMT = million metric tons.
(b) Waste Disposal includes sewage treatment, landfills, incineration, and other waste disposal.
(c) Cleaning and Surface Coatings includes laundering, degreasing, coatings and related processes, printing, adhesives and sealants, and other cleaning and surface coatings.
(d) Industrial Processes include chemical, food and agriculture, mineral processes, metal processes, wood and paper, glass and related products, electronic, and other industrial processes.
(e) Solvent Evaporation includes consumer products, architectural coating and related solvents, pesticides and fertilizers, and asphalt paving and roofing.
(f) Miscellaneous Processes include residential fuel combustion, farming operations, construction and demolition, paved road dust, unpaved road dust, fugitive windblown dust, fires, waste burning and disposal, utility equipment, cooking, and other miscellaneous processes.
(g) On-Road Motor Vehicles include trucks (all sizes), motorcycles, buses (all types), and motorhomes.
(h) Other Mobile Sources include aircraft; trains; ships; commercial boats, construction, airport, and oil and gas drilling equipment.

Congress passed the Consolidated Appropriations Act of 2008 (HR 2764) in December 2007, which requires reporting of GHG data and other relevant information from large emission sources and suppliers in the United States. The act is referred to as 40 CFR 98, Greenhouse Gas Reporting Program. The stated purpose of the act is to collect accurate and timely GHG data to inform future policy decisions. Facilities that emit 25,000 metric tons per year or more per year of GHGs are required to submit annual reports to the U.S. EPA. The U.S. EPA extended the deadline for reporting initial year (2010) GHG data to September 30, 2011.

3.2.5.2 California Regulations

CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act and federal Clean Air Act, and for regulating emissions from consumer products and motor vehicles. CARB has established California Ambient Air Quality Standards for all pollutants for which the federal government has established National Ambient Air Quality Standards and also has standards for sulfates, visibility, hydrogen sulfide and vinyl chloride. Hydrogen sulfide and vinyl chloride are not measured at any monitoring stations in the Basin because they are not considered to be a regional air quality problem. Federal and state air quality standards are presented in Table 3.2-1. California standards are generally more stringent than the National Ambient Air Quality Standards. CARB has established emission standards for vehicles sold in California and for various types of combustion equipment. CARB also sets fuel specifications to reduce vehicular emissions. However, CARB does not have direct regulatory approval authority over the proposed project.

California gasoline specifications are governed by both state and federal agencies. During the past two decades, federal and state agencies have imposed numerous requirements on the production and sale of gasoline in California. CARB adopted the Reformulated Gasoline Phase III regulations in 1999, which required, among other things, that California phase out the use of MTBE in gasoline. The CARB Reformulated Gasoline Phase III regulations have been amended several times (the most recent amendments were adopted in 2013) since the original adoption by CARB.

The California Clean Air Act (AB2595) mandates achievement of the maximum degree of emission reductions possible from vehicular and other mobile sources in order to attain the state ambient air quality standards by the earliest practical date.

California also has established a state air toxics program (AB1807, Tanner) which was revised by the new Tanner Bill (AB2728). This program sets forth provisions to the federal NESHAP program for control of hazardous air pollutants.

The Air Toxic "Hot Spots" Information and Assessment Act (AB2588), as amended by Senate Bill (SB) 1731, requires operators of certain stationary sources to inventory air toxic emissions from their operations and, if directed to do so by the local air district, prepare a health risk assessment to determine the potential health impacts of such emissions. If the health impacts are determined to be "significant" (greater than 10 per million exposures or non-cancer chronic or acute hazard index greater than 1.0), each facility must, upon approval of the health risk assessment, provide public notification to affected individuals.

Assembly Bill 32 – California Global Warming Solutions Act of 2006 AB 32 was signed into law by then-governor Arnold Schwarzenegger on September 27, 2006 and it is the first law to limit GHG emissions at the state level. The Act directs the State to reduce California emissions of GHG to 1990 levels by 2020. It instructs CARB to establish a program of regulatory and market mechanisms to achieve GHG reductions and to implement a mandatory GHG reporting and verification program. AB 32 required CARB to finalize GHG emission limits and reduction measures by January 1, 2011 and to implement them by January 1, 2012.

On October 20, 2011, CARB adopted the final cap-and-trade regulation. The program started on January 1, 2012, with an enforceable compliance obligation beginning with the 2013 GHG emissions. The regulation includes an enforceable GHG cap that will decline over time. Tesoro is regulated under CARB's cap-and-trade program. CARB distributed allowances, which are tradable, equal to the emissions allowed under the cap.

Executive Order S-01-07 (January 18, 2007) requires a 10 percent or greater reduction in the average fuel carbon intensity for transportation fuels in California regulated by CARB. CARB identified the Low Carbon Fuel Standard (LCFS) as a Discrete Early Action under AB 32. In 2009, CARB approved for adoption the LCFS regulation, which became fully effective in April 2010 and is codified at 17 CCR 95480−95490. The LCFS was re-adopted by CARB in 2015 following the resolution of several court cases. The LCFS will reduce greenhouse gas emissions by reducing the carbon intensity of transportation fuels used in California by at least 10 percent by 2020. Carbon intensity is a measure of the GHG emissions associated with the various production, distribution, and use steps in the "lifecycle" of a transportation fuel.

Executive Order B-30-15 (April 29, 2015) establishes a California GHG reduction target of 40 percent below 1990 levels by 2030. This is the most aggressive benchmark enacted by any government in North America to reduce carbon emissions over the next decade and a half. California is on track to meet or exceed the current target of reducing GHG emissions to 1990 levels by 2020, as established by AB32. California's new emission reduction target of 40 percent below 1990 levels by 2030 will make it possible to reach the ultimate goal of reducing emissions 80 percent under 1990 levels by 2050. This is in line with the scientifically established levels needed in the U.S. to limit global warming below 2 degrees Celsius - the warming threshold at which scientists say there will likely be major climate disruptions such as super droughts and rising sea levels.

3.2.5.3 Local Regulations

The Basin is under the jurisdiction of the SCAQMD which has regulatory authority over stationary air pollution emission sources and air pollution control equipment; the SCAQMD has limited authority over mobile sources. The SCAQMD is responsible for air quality planning in the Basin and development of the Air Quality Management Plan (AQMP). The AQMP establishes the strategies that will be used to achieve compliance with national Ambient Air Quality Standards and California Ambient Air Quality Standards in all areas within the

SCAQMD's jurisdiction. The SCAQMD generally regulates stationary sources of air pollutants, fugitive dust emission sources, and various components in fuels and paints that contribute to poor air quality. There are a number of SCAQMD regulations that may apply to the proposed project including Regulation II – Permits, Regulation III – Fees, Regulation IV – Prohibitions, Regulation IX – New Source Performance Standards, Regulation X - National Emissions Standards for Hazardous Air Pollutants (NESHAPS) Regulations, Regulation XI – Source Specific Standards, Regulation XIII – New Source Review, Regulation XIV – New Source Review of Carcinogenic Air Contaminants (including Rule 1401 - New Source Review of Toxic Air Contaminants), Regulation XVII – PSD, Regulation XX – RECLAIM Program, and Regulation XXX – Title V Permits.

3.3 HAZARDS AND HAZARDOUS MATERIALS

Hazards at a facility can occur due to natural events, such as earthquake, and non-natural events, such as mechanical failure or human error. A hazard analysis generally considers compounds or physical forces that can migrate off-site and result in acute health effects to individuals outside of the proposed project site. The risk associated with a facility is defined by the probability of an event and the consequence (or hazards) should the event occur. The hazards can be defined in terms of the distance that a release would travel, or the number of individuals of the public affected by a maximum single event defined as a “worst-case” scenario. This section discusses existing hazards to the community from potential upset conditions at the Refinery so as to provide a basis for evaluating the changes in hazards posed by the proposed project.

The major types of public safety risks at the Refinery consist of risk from accidental releases of regulated substances and from major fires and explosions. The discussion of the hazards associated with the existing Refinery relies on data in the Worst Case Consequence Analysis for the Tesoro Los Angeles Refinery (see Appendix C).

Shipping, handling, storing, and disposing of hazardous materials inherently poses a certain risk of a release to the environment. The regulated substances currently handled by the Refinery include chlorine, sulfuric acid, hydrogen sulfide, and ammonia. The Refinery also handles petroleum products including propane, butane, isobutane, gasoline, fuel oils, diesel, and other products, which pose a risk of fire and explosion at the Refinery. Accident scenarios for the existing Refinery evaluated herein include accidental releases of regulated substances and potential fires/explosions. The transportation risks from transporting hazardous materials are also described below.

3.3.1 TYPES OF ON-SITE HAZARDS

A hazard analysis generally considers the compounds or physical forces that can migrate off-site and result in acute health effects to individuals outside of the Refinery boundaries. It should be noted that hazards exist to workers on-site. However, the workers have the benefit of training in fire and emergency response procedures, protective clothing, access to respiratory protection, and so forth. Therefore, workers could be exposed to hazards and still be protected because of training and personal protective equipment. The general public does not typically have access to these safety measures and, therefore, could be adversely affected if a hazard situation results in impacts to areas off-site.

Hazards can be defined in terms of the distance that a release may travel by maximum single events (defined as "worst-case" scenarios). “Worst-case” scenarios represent the maximum extent of potential hazards that could occur within the process area that was evaluated, based on "worst-case" assumptions including meteorological conditions (generally low wind speed) and assuming a complete release of materials.

The potential hazards associated with industrial activities are a function of the materials being processed, processing systems, and procedures used to operate and maintain the facility. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and their process conditions, and can include the following events:

Exposure to Toxic Gas Clouds: Toxic gas clouds, (gases, e.g., hydrogen sulfide), could form a dense cloud and migrate off-site, thus, exposing individuals to toxic materials. "Worst-case" conditions tend to arise when very low wind speeds coincide with an accidental release, which can allow the chemicals to accumulate as a dense cloud rather than disperse.

Exposure to Flame Radiation: Flame (thermal) radiation is the heat generated by a fire and the potential impacts associated with exposure to it. Exposure to thermal radiation would result in burns, the severity of which would depend on the intensity of the fire, the duration of exposure, and the distance of an individual to the fire.

Thermal radiation can be caused by pool fire (fire of spilled material), torch fire (rupture of line followed by ignition), boiling liquid-expanding vapor explosion (BLEVE) of a pressurized storage vessel and/or flash fires (ignition of slow-moving flammable vapors).

Exposure to Explosion Overpressure: Several process vessels containing flammable explosive vapors and potential ignition sources are present at the Refinery. Explosions may occur if the flammable/explosive vapors come into contact with an ignition source. The greatest threat to off-site receptors could occur from a vapor cloud explosion (release, dispersion, and explosion of a flammable vapor cloud), or a confined explosion (ignition and explosion of flammable vapors within a building or confined area). An explosion could cause impacts to individuals and structures in the area due to overpressure.

Exposure to Contaminated Water: An upset condition and spill has the potential to adversely affect ground water and water quality. A spill of hazardous materials could occur under upset conditions, e.g., earthquake, tank rupture, and tank overflow. In the event of a spill, materials could migrate off-site if secondary containment and appropriate spill control measures are not in place.

Secondary effects, such as ash fallout from a fire, may occur as a result of a potential hazard. These effects are incident specific and would vary depending on the type of hazard, chemicals involved, and ambient conditions at the time of the incident. Therefore, these secondary effects are considered speculative and are not analyzed.

3.3.2 HAZARDS MODELING METHODOLOGY

For any one of the hazards that are inherent to the existing or proposed process systems at the Tesoro Los Angeles Refinery facility to adversely affect an area, a loss of containment must occur. If, for example, the hydrocarbons normally contained within the piping or equipment at the site are released, the resulting flash fire, vapor cloud explosion, torch fire, pool fire, or toxic vapor cloud has specific consequences that can be described by modeling.

To describe the hazards at any facility handling or storing hazardous materials, release scenarios are developed to simulate the potential loss of containment events. This requires calculation of material release rates and the properties of the material following a release. Following these calculations, hazard models are applied to describe the extent of a toxic or flammable vapor cloud (flash fire), torch fire radiation, pool fire radiation, BLEVE or overpressure from a vapor cloud explosion. With the results of these calculations, the extent of the potential hazard impacts can be determined.

In order to complete the hazard consequence analysis, the CANARY models were used, which contain a set of complex models that calculate release conditions, initial dilution of the vapor, and the subsequent dispersion of vapor introduced into the atmosphere. The models contain algorithms that account for thermodynamics, mixture behavior, transient release rates, gas cloud density relative to ambient air, initial velocity of released gas, and heat transfer effects from the surrounding atmosphere and the substrate. CANARY also contains models for pool fire, torch fire, and BLEVE radiation. These models account for impoundment configuration, material composition, target height relative to the flame, target distance from the flame, atmospheric attenuation, wind speed, and atmospheric temperature. The models are used to predict the potential distance to the injury threshold.

The endpoint hazard criterion used in the worst-case consequence analysis corresponds to a hazard level which might cause an injury. Table 3.3-1 presents the endpoint hazard criteria (referred to as the injury threshold) used in this hazard analysis. A summary of the types of existing hazards and the distance to the injury thresholds at the Refinery units that are associated with the proposed project are shown in Table 3.3-1.

3.3.3 TRANSPORTATION RISKS

3.3.3.1 Truck Transport

The transportation of hazardous substances poses a potential for fires, explosions, and hazardous materials releases. In general, the greater the vehicle miles traveled, the greater the potential for an accident. Statistical accident frequency varies, (especially for truck transport), and is related to the relative accident potential for the travel route since some freeways and streets are safer than others. The size of a potential release is related to the maximum volume of a hazardous substance that can be released in a single accident, should an accident occur, and the type of failure of the containment structure, e.g., rupture or leak. The potential consequences of the accident are related to the size of the release, the population density at the location of the accident, the specific release scenario, the physical and chemical properties of the hazardous material, and the local meteorological conditions.

The factors that enter into accident statistics include distance traveled and type of vehicle or transportation system. Factors affecting automobiles and truck transportation accidents include the type of roadway; presence of road hazards; vehicle type; maintenance and physical condition; and driver training. A common reference frequently used in measuring risk of an accident is the number of accidents per million miles traveled. Complicating the assessment of risk is the fact that some accidents can cause significant damage without injury or fatality.

TABLE 3.3-1

Summary of Existing Hazards[(a)]

Unit	Injury Threshold	Distance to Hazard (feet)	Type of Hazard
Carson Refinery			
No.51 Vaccum	LFL[(b)]	155	Flash Fire
Alkylation	LFL	585	Flash Fire
FCCU	LFL	600	Flash Fire
HCU	30 ppm[(c)]	1,250	Toxic (H_2S)
Mid-Barrel Hydrotreater	30 ppm[(c)]	400	Toxic (H_2S)
Naptha HDS	LFL	1,035	Flash Fire
Naptha Isomerization	LFL	530	Flash Fire
LHU	LFL	585	Flash Fire
Wilmington Refinery			
FCCU	Shutdown		
HTU-1 & -2	LFL	1,065	Flash Fire
HTU-4	Modifications do not affect vulnerability zone		
CRU-3	30 ppm[(c)]	2,190	Toxic (H_2S)
HCU	30 ppm[(c)]	1,450	Flash Fire
Replace Crude Tanks	30 ppm[(c)]	190	Pool Fire
Other			
LPG Rail Car Unloading	~~1.0 psig~~ ~~[(d)]~~ 1,600 btu/(hr-ft^2)	1,700	BLEVE Fireball

(a) Summarized from the Worst Case Consequence Analysis for the Tesoro Los Angeles Refinery. See Appendix C for further details and assumptions.
(b) Lower Flammable Limit.
(c) Emergency Response Planning Guideline (ERPG) 2 levels; ppm = parts per million.
~~(d) psig = pounds per square inch gauge.~~

Every time hazardous materials are moved from the site of generation, there are opportunities for accidental (unintentional) releases. The U.S. Department of Transportation (U.S. DOT) conducted a study on the comparative risks of hazardous materials and non-hazardous materials truck shipment accidents and incidents. The Federal Motor Carrier Safety Administration (FMCSA) compared risks of hazardous materials truck shipment accidents and incidents to non-hazardous materials truck shipment accidents and incidents (FMCSA, 2001). The estimated accident rate for trucks (shipping non-hazardous materials) was 0.73 per million miles traveled. The average accident rate for trucks transporting hazardous materials (all hazard classes) was estimated to be 0.32 per million miles traveled (FMCSA, 2001). Though it is difficult to compare hazardous and non-hazardous transport risk, the differences appear to be significant enough to conclude that the magnitude of non-hazardous transport accidents dominates highway transport risk. The specific hazardous material trucking regulations and additional care provided by carriers and shippers of hazardous materials appear to be factors reducing the accident rate for hazardous material shipments (FMCSA, 2001).

The County of Los Angeles has developed criteria to determine the safest transportation routes. Some of the factors which need to be considered when determining the safest direct routes include traffic volume, vehicle type, road capacity, pavement conditions, emergency response capabilities, spill records, adjacent land use, and population density. In managing the risk involved in the transportation of hazardous materials, all these factors must be considered.

The actual occurrence of an accidental release of a hazardous material associated with a traffic accident cannot be predicted. The location of an accident or whether sensitive populations would be present in the immediate vicinity also cannot be identified. In general, the shortest and most direct route that takes the least amount of time would have the least risk of an accident. Hazardous material transporters do not routinely avoid populated areas along their routes, although they generally use approved truck routes that take population densities and residential areas into account.

The hazards associated with the transport of regulated hazardous materials (California Code of Regulations (CCR) Title 19, Division 2, Chapter 4.5 or the CalARP requirements) would include the potential exposure of numerous individuals in the event of an accident that would lead to a spill. Factors such as amount transported, wind speed, ambient temperatures, route traveled, and distance to sensitive receptors are considered when determining the consequence of a hazardous material spill.

3.3.3.2 Rail Transportation

Train accidents are required to be reported to the Federal Railroad Administration (FRA). Train accident reports identify the causes and contributing factors causing the accident. Rail accidents can stem from human errors (e.g., switching, coupling, transloading, speeding); equipment failures (e.g., crossing guard failures, leaking valve, coupling failure, broken rails, brake failure, corrosion, etc.); system or procedural failures (e.g., interim storage on holding track, routing, emergency response, maintenance, circuitous routing); and external events (vandalism, at-grade crossing, flood, earthquake, fire, bridge failure) (CCPS, 1995).

Depending on the type of hazardous material being transported, transportation of hazardous substances poses a potential for fires, explosions, and hazardous materials releases. In general, the greater the miles traveled the greater the potential for an accident. Statistical accident frequency varies, but is positively correlated to the number of miles traveled. The size of a potential release is related to the maximum volume of a hazardous substance that can be released in a single accident, should an accident occur, and the type of failure of the containment structure, e.g., rupture or leak. The potential consequences of the accident are related to the size of the release, the population density at the location of the accident, the specific release scenario, the physical and chemical properties of the hazardous material, and the local meteorological conditions.

The FRA regulations on reporting railroad accidents/incidents are found primarily in 49 CFR Part 225. The purpose of the regulations is to provide FRA with accurate information concerning the hazards and risks that exist on the nation's railroads. The FRA uses this information for regulatory and enforcement purposes, and for determining comparative trends of railroad safety. These regulations preempt states from prescribing accident/incident reporting requirements. The FRA compiles data on railroad-related accidents, injuries and fatalities to depict the nature and cause of rail-related accidents and improve safety. Train accident data reported in the United States, and California between 2005 and 2014 are summarized in Table 3.3-2. Based on the train accident data for the United States, the train accident rate varied from 2.3 accidents per million miles traveled to 4.4 accidents per million miles traveled over the 10-year period from January 2005 to December 2014. The train accident rate for 2012/2013 was 2.4 train accidents per million miles traveled.

TABLE 3.3-2

Summary of National and California Train Accident Data

Category	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Train Accident Data for United States										
Total Accidents/ Incidents[(a)]	14,311	13,803	13,936	12,958	11,247	11,630	11,502	11,050	11,594	11,863
Accident Rate[(b)]	18.1	17.0	17.6	16.7	16.8	16.5	16.0	15.1	15.5	15.5
Train Accidents	3,266	2,998	2,693	2,481	1,912	1,902	2,022	1,760	1,824	1,758
Train Accident Rate[(b)]	4.1	3.7	3.4	3.2	2.9	2.7	2.8	2.4	2.4	2.3
Train Accidents on Main Line	1,021	981	854	767	619	617	621	504	571	520
Accident Rate on Main Line	1.5	1.4	1.2	1.1	1.1	1.0	1.0	0.8	0.9	0.8
Hazmat Releases[(c)]	39	30	46	21	22	21	21	26	18	15
Cars Carrying Hazmat[(d)]	8,034	9,000	8,562	8,430	6,440	7,567	7,582	6,877	7,192	7,532
Hazmat Cars Damaged/Derailed	915	1,047	1,056	750	749	722	666	672	822	785
Hazmat Cars Releasing Contents	52	71	76	37	44	40	66	50	78	26
Total Train Miles[(e)]	789.0	813.6	793.6	774.0	667.9	704.8	717.6	731.6	748.5	765.4
Train Accident Data for California										
Total Accidents/ Incidents[(a)]	965	944	950	843	728	724	708	828	806	786
Train Accidents	199	191	155	120	101	87	87	86	99	77
Hazmat Releases	2	3	4	1	1	1	0	0	0	0

Source: Federal Railroad Administration, Office of Safety Analysis data reports. (accessed June 4, 2015)
http://safetydata.fra.dot.gov/officeofsafety/publicsite/query/tenyr1a.aspx

(a) Total accident/incidents include train accidents, highway-rail accidents, and other incidents.
(b) Events per million train miles.
(c) Number of accidents involving a hazmat release.
(d) Number of rail cars that released hazardous materials.
(e) Number in million train miles.

3.3.4 PIPELINE RISKS

The U.S. DOT Pipeline and Hazardous Material Safety Administration (PHMSA), keeps detailed pipeline incident and mileage reports to chart fatalities, injuries, property damage, and loss of barrels of product resulting from pipeline incidents.

Pipeline accident events, referred to as “significant incidents” by the PHMSA, include all incidents reported by a pipeline operator when any of the following conditions are met: (1) fatality or injury requiring in-patient hospitalization (also referred to as a “serious incident”); (2) $50,000 or more in total costs; (3) highly volatile liquid releases of five barrels or more or other liquid releases of 50 barrels or more; and/or (4) liquid releases resulting in an unintentional fire or explosion.

Table 3.3-3 shows the total number of incidents each year between 2004 and 2013 for onshore hazardous liquid pipelines, including crude oil and petroleum products, in California. The PHMSA data show that over a 10-year period (2004 - 2013), a total of 254 incidents were reported, one of which resulted in fatalities and serious injuries. These 254 significant incidents resulted in 32,713 gross barrels spilled, and a net loss of 11,351 barrels (barrels not recovered). According to the U.S. DOT Incident and Mileage Reports, California contains 6,525 miles of hazardous liquid pipeline, transporting primarily crude oil and petroleum products.

TABLE 3.3-3

California Hazardous Liquid Onshore Pipeline Incidents (2004 – 2013)

Year	Number	Serious	Significant	Fatalities	Injuries	Gross Barrels Spilled	Net Barrels Lost
2004	34	1	9	5	3	8,543	4,655
2005	28	0	13	0	0	7,266	3,469
2006	33	0	13	0	0	3,954	1,704
2007	32	0	7	0	0	1,215	194
2008	30	0	11	0	0	8,597	855
2009	19	0	2	0	0	294	27
2010	15	0	6	0	0	982	163
2011	24	0	8	0	0	272	128
2012	22	0	6	0	0	777	23
2013	17	0	7	0	0	813	133
Totals	254	1	82	5	3	32,713	11,351
2 Year Average (2012 – 2013)	20	0	7	0	0	795	78
5 Year Average (2009 – 2013)	19	0	6	0	0	628	95
10 Year Average (2004 – 2013)	25	0	8	1	0	3,271	1,135

Source: PHMSA, 2014.

3.3.5 EXISTING SOIL AND GROUNDWATER CONTAMINATION

Historic operations at the Refinery have resulted in releases of hazardous materials (primarily petroleum hydrocarbons) to soil and groundwater in some areas at the Refinery. Potentially contaminated sites include proposed project areas as well as non-project areas. In some cases, these past releases deposited petroleum hydrocarbons in soils on-site, which then migrated to underlying groundwater in portions of the Refinery. The Carson Operations and Wilmington Operations have known groundwater and soil contamination that have been and will continue to be remediated and managed under Regional Water Quality Control Board (RWQCB) oversight. The nature and extent of soil and groundwater contamination at the Carson and Wilmington Operations are well understood. Extensive soil and groundwater investigations have been conducted at the site with the oversight of the RWQCB, and ongoing remedial programs have been implemented to address the identified impacts. Monitoring and remediation have been performed under Cleanup and Abatement Orders (CAO), and documented in reports publicly available at www.geotracker.waterboards.ca.gov. Monitoring and remediation at the Carson Operations have been conducted under CAO 90-121, and at the Wilmington Operations under CAO 88-70 and CAO R4-2011-0037. During construction of the proposed project, the potential to encounter contaminated soil and groundwater exists.

3.3.5.1 Existing Soil Contamination

Soil samples have been collected in areas of the Refinery where construction of the proposed project is to take place to characterize the soil for disposal purposes (i.e., hazardous or non-hazardous waste designation). Of the 44 soil samples analyzed, samples indicate that 95 percent of the soil to be potentially excavated will be classified as non-hazardous waste. During the soil sampling activities, air sampling consistent with SCAQMD Rule 1166 was performed. Two areas where proposed project construction is planned (at the Wilmington Operations in the vicinity of the 24-inch piping associated with the two replacement tanks and in the vicinity of HCU) have been shown to have shallow contamination which may have VOC concentrations that exceed the Rule 1166 50 ppm criterion, which requires excavated soil to be containerized and removed from the site.

3.3.5.2 Existing Groundwater Contamination

An extensive network of groundwater monitoring wells at the Refinery is currently being maintained, including wells in the proposed project areas. The wells monitor groundwater conditions for current and historic releases. Data from quarterly groundwater reports identify the depth to groundwater, varying widely from as shallow as approximately 5.9 feet to as deep as approximately 63.8 feet below ground surface (bgs) (AECOM, 2013, URS, 2014, and Trihydro, 2013). Table 3.3-4 presents a summary of the range of concentrations of the hydrocarbon-impacted groundwater that exists beneath the Refinery.

TABLE 3.3-4

2013 Hydrocarbon Concentrations in Groundwater milligrams per liter (mg/L)

Hydrocarbon	Minimum (mg/L)	Maximum (mg/L)
TPH-D[a]	ND (0.075)	160.0
TPH-G[b]	ND (0.05)	3.0
Benzene	ND (0.005)	22
Ethyl-Benzene	ND (0.01)	1.8
Toluene	ND (0.01)	2.0
Total Xylenes	ND (0.01)	6.7

Sources: AECOM, 2013. Semi-Annual Subsurface Clean-up Progress Report – January 2013 through June 2013; URS, 2014. Semi-Annual Groundwater Monitoring/Sampling Report, Second Semester 2013; Trihydro, 2013. Fourth Quarter 2013 Tank 80214 Release Dissolved Phase Monitoring Report for October 2013 through December 2013

(a) TPH-D: Total Petroleum Hydrocarbons as Diesel (C12 – C24)

(b) TPH-G: Total Petroleum Hydrocarbons as Gasoline (C6-C12)

3.3.6 EXISTING REFINERY SAFETY SYSTEMS

The Tesoro Los Angeles Refinery operates numerous safety systems to minimize the potential for and provide emergency services in the event of an accident or release from the Refinery operations. Existing safety systems are described in this section of the EIR.

3.3.6.1 Existing Fire-Fighting Capabilities

At the Wilmington Operations, a new firewater distribution system has been under construction for several years and is nearing completion. The City of Los Angeles Fire Department has a requirement that the Refinery firewater distribution system must be capable of flowing 12,000 gpm of firewater at the most remote part of the system with 20 (psig) residual pressure. The design of the new Refinery firewater distribution system meets that requirement. The Refinery firewater distribution system is connected to the LADWP water system, which can supply 5,000 gpm minimum to the Refinery system with no pump assist.

Wilmington Operations firewater is supplied in the North Area from an existing 55,000 barrel tank and in the South Area from an existing 3,800 bbl tank, Tank 3809. There are two 2,500 gpm pumps in the north area which use water from the 55,000 bbl tank. In the south area, there is a single 2,500 gpm pump which uses water from Tank 3809. In addition to the firewater sources in the north and south areas, there is a diesel engine driven 3,500 gpm fire pump.

The Wilmington Operations operate an Emergency Response Team (ERT), which has 50 Refinery employees trained in rescue, heavy equipment apparatus operations (i.e., response equipment such as fire trucks, trailer mounted pumps, etc.), and hazmat response. There is a minimum of six ERT members per shift plus four supervisors. Training for ERT employees is conducted monthly and includes live fire and medical drills.

Water for fire-fighting at the Carson Operations is stored in tanks which provide a minimum supply of more than three hours without makeup flow to the tanks. Makeup water is provided through existing city water mains from California Water Service Company (CWS); water wells on Refinery property are a backup to the city water mains. The makeup rate for each tank is approximately 8,000 gpm. Firewater pumping capacities include:

- Freshwater Pump Station – two, 2,500 gpm centrifugal, electric motor driven pumps and one 2,500 gpm centrifugal, diesel pump.
- No. 2 Foam Pump house – two 2,500 gpm electric motor pumps and one 2,000 gpm diesel pump.
- Tank 860 – one 2,500 gpm centrifugal, diesel-driven pump and one 1,500 gpm centrifugal, and steam-driven pump.
- Tank 10 – one diesel-driven 5,000 gpm centrifugal pump.

The Carson Operations firewater distribution system is maintained at approximately 130 psi, with a total capacity flow of 22,000 gpm. A 2011 study at the Carson Operations determined calculated firewater demands for fire scenarios in process units and storage tanks. The firewater distribution system was modeled to determine if it could supply the calculated demands. The conclusion of the study was that the firewater distribution system could supply Carson Operations demands.

The Carson Operations has a total of 115 ERT employees. There are 12-14 ERT employees on the night shift and 25-30 employees on the day shift. Training for ERT employees is conducted monthly and consists of live drills.

3.3.6.2 Deluge and Foam Systems

LPG spheres and spheroid tanks at both the Carson and Wilmington Operations are protected with deluge water spray systems. These systems are either automatically or manually deluged. Lines supplied from fire hydrants located around each sphere can supplement the spray system and may provide cooling for piping and structural supports involved in a fire.

Fixed roof storage tanks at the Carson and Wilmington Operations are generally protected with fixed firefighting foam chambers or subsurface foam capabilities. Covered floating roof tanks are generally equipped with fixed foam systems and foam dams for the seal area of the tank.

3.3.6.3 Fire Fighting Support Vehicles and Equipment

The Carson Operations have two foam pumping fire engines, one foam pumping truck, six truck-mounted quick attack foam pumping trucks and one ladder truck. The Wilmington Operations have three foam pumpers, four quick attack trucks that supply foam, and two foam tenders. In addition, there are numerous wheeled and portable fire extinguishers throughout the Tesoro Los Angeles Refinery.

Fire hydrants are located throughout the Refinery, with most potential fire areas covered by at least two hydrants. Fire hydrants are spaced 200 feet apart in the process areas and tank farms.

3.3.6.4 Spill Response

The Refinery is equipped with secondary containment as required in the Spill Response, Control, and Countermeasure Plan. Additional spill response equipment is available through commercial contracts with suppliers that specialize in spill cleanup. Commercial contractors that specialize in oil cleanup are employed to place any additional booms or other spill capture equipment, if necessary, and to remove oil from the water, if the oil is released into waterways, e.g., the Dominguez Channel.

3.3.7 REGULATORY BACKGROUND

3.3.7.1 Federal Regulations

3.3.7.1.1 U.S. EPA Emergency Planning and Community Right-to-Know Act (EPCRA)

The objective of the EPCRA is to: (1) allow state and local planning for chemical emergencies, (2) provide for notification of emergency releases of chemicals, and (3) address communities' right-to-know about toxic and hazardous chemicals. EPCRA §302 requires facilities to notify the State Emergency Response Commission and any Local Emergency Response Committees of the presence of any "extremely hazardous substance" (the list of such substances is in 40, CFR Part 355) if it has such a substance in excess of the substance's threshold planning quantity, and directs the facility to appoint an emergency response coordinator. Implementation of EPCRA has been delegated to the State of California. The California Emergency Management Agency requires businesses to develop a Hazardous Materials Business Plan if they handle (including storage) hazardous materials in quantities equal to or greater than 55 gallons, 500 pounds, or 200 cubic feet of gas or extremely hazardous substances above the threshold planning quantity. The Plan includes inventories of hazardous materials, an emergency plan, and implements a training program for employees. This plan is required to be submitted to the Certified Unified Permitting Agencies (CUPA) for use by State and local emergency response agencies.

3.3.7.1.2 Department of Transportation Hazardous Materials Regulations (Title 49 CFR Parts 100-185)

The U.S. DOT Hazardous Materials Regulations cover all aspects of hazardous materials packaging, handling, and transportation. Parts 172 (Emergency Response), 173 (Packaging Requirements), 174 (Rail Transportation), 177 (Highway Transportation), 178 (Packaging Specifications) and 180 (Packaging Maintenance) would all apply to the proposed project activities.

3.3.7.1.3 The Hazardous Materials Transportation Act, (49 CFR 171 Subchapter C)

The Hazardous Materials Transportation Act (HMTA) is the federal legislation that regulates transportation of hazardous materials. The primary objective of the HMTA is to provide adequate protection against the risks to life and property inherent in the transportation of hazardous material in commerce by improving the regulatory and enforcement authority of the Secretary of Transportation. A hazardous material, as defined by the Secretary of Transportation, is any "particular quantity or form" of a material that "may pose an unreasonable risk to health and safety or property." The primary regulatory authorities are the U.S. DOT, the Federal Highway Administration, and the Federal Railroad Administration. The HMTA requires that carriers report accidental releases of hazardous materials to the U.S. DOT at the earliest practical moment (49 CFR Subchapter C). Incidents that must be reported include deaths, injuries requiring hospitalization, and property damage exceeding $50,000. Caltrans sets similar standards for trucks in California. The Caltrans and federal regulations are enforced by the California Highway Patrol (CHP).

3.3.7.1.4 Hazardous Materials and Waste Regulations

Resource Conservation and Recovery Act: The Resource Conservation and Recovery Act of 1976 authorizes the U.S. EPA to control the generation, transportation, treatment, storage, and disposal of hazardous waste. This federal regulation is codified in 40 CFR. In 1984, the Resource Conservation and Recovery Act was amended with addition of the Hazardous and Solid Waste Amendments, which authorized increased enforcement by the U.S. EPA, more strict hazardous waste standards, and a comprehensive underground storage tank program. Likewise, the Hazardous and Solid Waste Amendments focused on waste reduction and corrective action for hazardous releases. The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by the Hazardous and Solid Waste Amendments. Individual states, including California, may implement their own hazardous waste programs under the Resource Conservation and Recovery Act, with approval by the U.S. EPA. In 1992, the California Department of Toxic Substances Control received authorization from the U.S. EPA to implement the Resources Conservation Recovery Act, Subtitle C requirements and the associated regulations in California.

Occupational Safety and Health Administration Regulations: The Occupational Safety and Health Administration regulations, intended to create a safe workplace, are found at 29 CFR Part 1910, Subpart H, and include procedures and standards for safe handling, storage, operation, remediation, and emergency response activities involving hazardous materials and waste. Pertinent sections of Subpart H include § 1910.106 (Flammable and Combustible Liquids) and § 1910.120 (Hazardous Waste Operations and Emergency Response).

The Hazardous Waste Operations and Emergency Response regulations contain requirements for worker training programs, medical surveillance for workers engaging in the handling of hazardous materials or wastes, and waste site emergency and remediation planning for those who are engaged in specific clean-up, corrective action, hazardous material handling, and emergency response activities as specified by §§ 1910.120(a)(1)(i-v) and 1926.65(a)(1)(i-v).

Comprehensive Environmental Response, Compensation and Liability Act: The Comprehensive Environmental Response, Compensation, and Liability Act, which is often commonly referred to as Superfund, is a federal statute that was enacted in 1980 to address abandoned sites containing hazardous waste and/or contamination. The Comprehensive Environmental Response, Compensation, and Liability Act was amended in 1986 by the Superfund Amendments and Reauthorization Act, and by the Small Business Liability Relief and Brownfields Revitalization Act of 2002.

The Comprehensive Environmental Response, Compensation, and Liability Act establishes prohibitions and requirements concerning closed and abandoned hazardous waste sites; establishes liability of persons responsible for releases of hazardous waste at these sites; and establishes a trust fund to provide for cleanup when no responsible party can be identified. The trust fund is funded largely by a tax on the chemical and petroleum industries. The Comprehensive Environmental Response, Compensation, and Liability Act also provides federal jurisdiction to respond directly to releases or impending releases of hazardous substances that may endanger public health or the environment.

3.3.7.1.5 Oil Storage and Pipeline Regulations

Oil Pollution Act: The Oil Pollution Act was signed into law in 1990 to give the federal government authority to better respond to oil spills. The Oil Pollution Act improved the federal government's ability to prevent and respond to oil spills, including provision of money and resources. The Oil Pollution Act provides a mechanism for establishing polluter liability, gives states enforcement rights in navigable waters of a state, mandates the development of spill control and response plans for all vessels and facilities, increases fines and enforcement mechanisms, and establishes a federal trust fund for financing clean-up.

The Oil Pollution Act also establishes the National Oil Spill Liability Trust Fund to provide financing for cases in which the responsible party is either not readily identifiable, or cannot pay the cleanup/damage costs. In addition, the Oil Pollution Act expands provisions of the National Oil and Hazardous Substances Pollution Contingency Plan, more commonly called the National Contingency Plan, requiring the federal government to direct all public and private oil spill response efforts. The Oil Pollution Act also requires area committees, composed of federal, state, and local government officials, to develop detailed, location-specific area contingency plans. In addition, the Oil Pollution Act directs owners and operators of vessels, and certain facilities that pose a serious threat to the environment, to prepare their own specific facility response plans. The Oil Pollution Act increases penalties for regulatory non-compliance by responsible parties; gives the federal government broad enforcement authority; and provides individual states the authority to establish their own laws governing oil spills, prevention measures, and response methods.

U.S. Department of Transportation, Office of Pipeline Safety: The Office of Pipeline Safety, within the U.S. DOT, PHMSA, has jurisdictional responsibility for ensuring the safe and secure movement of hazardous liquid and gas through pipelines under its jurisdiction in the United States. Title 49 of the U.S.C. relates to the role of transportation, including pipelines, in the United States. 49 CFR Parts 190-199 establish minimum pipeline safety standards. The Office of the State Fire Marshal works in partnership with the Federal Pipeline and Hazardous Materials Safety Administration to assure pipeline operators are meeting requirements for safe, reliable, and environmentally sound operation of their facilities for intrastate pipelines within California.

49 CFR Part 190 – Pipeline Safety Procedures: 49 CFR Part 190 outlines the pipeline safety programs and rule making procedures utilized by the Pipeline and Hazardous Materials Safety Administration under Title 49 U.S.C. 60101 et seq. (pipeline safety laws) and Title 49 U.S.C. 5101 et seq. (hazardous material transportation laws).

49 CFR Part 194 – Response Plans for Onshore Oil Pipelines: 49 CFR Part 194 outlines requirements for oil spill response plans to reduce/mitigate the environmental impact of oil discharges from onshore oil pipelines. 49 CFR Part 194 covers general response plan requirements as well as reporting and approval procedures for onshore oil pipelines.

49 CFR Part 195 – Transportation of Hazardous Liquids by Pipeline: 49 CFR Part 195 contains regulations authorized by the Hazardous Liquid Pipeline Safety Act of 1979 for the design, construction, testing, operation, and maintenance of pipelines, including pressure testing requirements for pipeline components (valves, pumps, and tie-ins) as well as above ground breakout tanks. 49 CFR Part 195 also prescribes safety standards and reporting requirements for pipeline facilities used in the transportation of hazardous liquids or carbon dioxide, and outlines procedures for pipeline facility operations and maintenance, including but not limited to, qualifications of pipeline personnel and pipeline corrosion control. Because the requirements found within 49 CFR Part 195 are applicable only to interstate pipelines, the pipelines included as part of the proposed project would not be regulated under this provision, but would be regulated by the California Pipeline Safety Act and the Pipeline Safety Division of the Office of the State Fire Marshal.

49 CFR Part 195(b) – Hazardous Liquid Accident Database: 49 CFR Part 195(b) requires liquid pipeline operators to report any spills and/or accidents to the U.S. DOT if they meet one or more of the following criteria: (1) explosion or fire not intentionally set by the operator; (2) loss of 50 or more barrels of hazardous liquid or carbon dioxide; (3) escape to the atmosphere of more than five barrels a day of highly volatile liquids; (4) death of any person; (5) bodily harm to any person resulting in loss of consciousness, a person is required to be carried from the scene, a person requires medical treatment, or a person is disabled and prevented from normal duties or the pursuit of normal activities beyond the day of the accident; or (6) estimated property damage, including cost of clean-up and recovery, value of lost product, and damage to the property of the operator or others, or both, exceeding $50,000.

3.3.7.1.6 Other Federal Regulations

Chemical Facility Anti-Terrorism Standards: The Chemical Facility Anti-terrorism Standards are a set of U.S. Government security regulations for high-risk chemical facilities such as chemical plants, electrical generating facilities, refineries, and universities. The Federal Department of Homeland Security promulgated the final rule containing the Chemical Facility Anti-terrorism standards in 2007. This rule established risk-based performance standards for the security of chemical facilities. It requires covered chemical facilities to prepare Security Vulnerability Assessments, which identify facility security vulnerabilities, and to develop and implement Site Security Plans.

Process Safety Management (29 CFR 1910.119): Under this section, facilities that use, store, manufacture, handle, process, or move hazardous materials are required to conduct employee safety training; have an inventory of safety equipment relevant to potential hazards; have knowledge on use of the safety equipment; prepare an illness prevention program; provide hazardous substance exposure warnings; prepare an emergency response plan; and prepare a fire prevention plan. In addition, 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals, specifically requires prevention program elements to protect workers at facilities that have toxic, flammable, reactive, or explosive materials. Prevention program elements are aimed at preventing or minimizing the consequences of catastrophic releases of chemicals and include process hazard analyses, formal training programs for employees and contractors, investigation of equipment mechanical integrity, and an emergency response plan.

Emergency Action Plans (29 CFR 1910.38): Under this section, facilities that are required to have fire extinguishers must also have an emergency action plan to ensure the safe response to emergencies. The purpose of an emergency action plan is to facilitate and organize employer and employee actions during workplace emergencies.

Spill Prevention, Control, and Countermeasure (SPCC) Rule (40 CFR Part 112): The SPCC rule includes requirements for oil spill prevention, preparedness, and response to prevent oil discharges to navigable waters and adjoining shorelines. The rule requires specific facilities to prepare, amend, and implement SPCC Plans. SPCC Plans require applicable facilities to take steps to prevent oil spills including: (1) using suitable storage containers/tanks; (2) providing overfill prevention, e.g., high-level alarms; (3) providing secondary containment for bulk storage tanks; (4) providing secondary containment to catch oil spills during transfer activities; and (5) periodically inspecting and testing pipes and containers. The SPCC rule is part of the Oil Pollution Prevention regulations.

3.3.7.2 State Regulations

3.3.7.2.1 Hazardous Materials and Waste Regulations

California Hazardous Waste Control Law: The California Hazardous Waste Control Law is administered by the California Environmental Protection Agency (CalEPA) to regulate hazardous wastes within the State of California. While the California Hazardous Waste Control Law is generally more stringent than the Resource Conservation and Recovery Act, both the state and federal laws apply in California. The DTSC, one of six departments that comprises the CalEPA, is the primary agency in charge of enforcing both the federal and state hazardous materials laws in California. The DTSC regulates hazardous waste, oversees the cleanup of existing contamination, and pursues avenues to reduce hazardous waste produced in California.

The DTSC regulates hazardous waste in California under the authority of the Resource Conservation and Recovery Act, the California Hazardous Waste Control Law, and the California Health and Safety Code. Under the direction of the CalEPA, the DTSC maintains the Cortese and Envirostor databases of hazardous materials and waste sites as specified under Government Code §65962.5. As noted in the NOP/IS for the proposed project, the Wilmington Operations are not included in the §65962.5 list, but the Carson Operations are on the list.

The Hazardous Waste Control Law (22 CCR Chapter 11, Appendix X) also lists 791 chemicals and approximately 300 common materials which may be hazardous; establishes criteria for identifying, packaging, and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal, and transportation; and identifies some wastes that cannot be disposed of in landfills.

California Occupational Safety and Health Administration: CalOSHA is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. The CalOSHA requires the employer to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings. The CalOSHA standards are generally more stringent than federal regulations.

Hazardous Materials Release Notification: Many state statutes require emergency notification of a hazardous chemical release, including:

- California Health and Safety Code §§ 25270.7, 25270.8, and 25507;
- California Vehicle Code § 23112.5;
- California Public Utilities Code § 7673 (General Orders #22-B, 161);
- California Government Code §§ 51018 and 8670.25.5(a);
- California Water Code §§ 13271 and 13272; and,
- California Labor Code § 6409.1(b)10.

California Accident Release Prevention (CalARP) Program: The CalARP Program (19 CCR Division 2, Chapter 4.5) requires the preparation of Risk Management Plans (RMPs). RMPs are documents prepared by the owner or operator of a stationary source and contain detailed information including: (1) regulated substances held on-site at the stationary source; (2) off-site consequences of an accidental release of a regulated substance; (3) the accident history at the stationary source; (4) the emergency response program for the stationary source; (5) coordination with local emergency responders; (6) hazard review or process hazard analysis; (7) operating procedures at the stationary source; (8) training of the stationary source's personnel;

(9) maintenance and mechanical integrity of the stationary source's physical plant; and (10) incident investigation.

Hazardous Materials Disclosure Program: The Unified Program administered by the State of California consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities for the state's environmental and emergency management programs, which include: Hazardous Materials Release Response Plans and Inventories (business plans), the California Accidental Release Prevention Program, the Underground Storage Tank Program, the Aboveground Petroleum Storage Tank Program, the Hazardous Waste Generator and On-site Hazardous Waste Treatment (tiered permitting) Programs, and the California Uniform Fire Code, Hazardous Material Management Plans and Hazardous Material Inventory Statements. The Unified Program is implemented at the local government level by CUPAs. The Los Angeles County Fire Department is the CUPA for the entire County except in the cities of El Segundo, Glendale, Long Beach, Los Angeles, Santa Fe Springs, Santa Monica, and Vernon, where the fire departments of these cities are CUPAs within their own jurisdictions, except for Vernon where the Vernon Health and Environmental Control Department is the City's CUPA.

Hazardous Materials Management Act: The State of California (California Health and Safety Code Division 20, Chapter 6.95) requires any business that handles more than a specified amount of hazardous or extremely hazardous materials, termed a "reportable quantity," to submit a Hazardous Materials Business Plan to its CUPA. Business plans must include an inventory of the types, quantities, and locations of hazardous materials at the facility. Businesses are required to update their business plans at least once every three years and the chemical portion of their plans every year. Also, business plans must include emergency response plans and procedures to be used in the event of a significant or threatened significant release of a hazardous material. These plans must identify the procedures to follow for immediate notification to all appropriate agencies and personnel of a release, identification of local emergency medical assistance appropriate for potential accident scenarios, contact information for all company emergency coordinators, a listing and location of emergency equipment at the business, an evacuation plan, and a training program for business personnel. The requirements for hazardous materials business plans are specified in the California Health and Safety Code as noted above and 19 CCR.

Hazardous Materials Transportation in California: California regulates the transportation of hazardous waste originating or passing through the State in Title 13, CCR. The CHP and Caltrans have primary responsibility for enforcing federal and State regulations and responding to hazardous materials transportation emergencies. The CHP enforces materials and hazardous waste labeling and packing regulations that prevent leakage and spills of material in transit and provide detailed information to cleanup crews in the event of an incident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of the CHP. Caltrans has emergency chemical spill identification teams at locations throughout the State.

3.3.7.2.2 Oil Production and Pipeline Regulations and Oversight

Overview of California Pipeline Safety Regulations: State of California laws found at Part 51010 through 51018 of the Government Code provide specific safety requirements, including: (1) periodic hydrostatic testing of pipelines, with specific accuracy requirements on leak rate determination; (2) hydrostatic testing by state-certified independent pipeline testing firms; (3) pipeline leak detection; and, (4) reporting of all leaks. Recent amendments require pipelines to include means of leak prevention and cathodic protection, with acceptability to be determined by the State Fire Marshal. All new pipelines must also be designed to accommodate passage of instrumented inspection devices (smart pigs) through the pipeline.

Oil Pipeline Environmental Responsibility Act (California Civil Code Section 3333.4): This Act requires every pipeline corporation qualifying as a public utility and transporting crude oil in a public utility oil pipeline system to be held strictly liable for any damages incurred by "any injured party which arise out of, or are caused by, the discharge or leaking of crude oil or any fraction thereof."

3.3.7.3 Local Regulations

South Coast Air Quality Management District – Rule 1166: SCAQMD Rule 1166 establishes requirements to control the emission of VOCs from excavating, grading, handling, and treating soil contaminated from leakage, spillage, or other means of VOCs deposition. Rule 1166 stipulates that any parties planning on excavating, grading, handling, transporting, or treating soils contaminated with VOCs must first apply for and obtain, and operate pursuant to, a mitigation plan approved by the Executive Officer prior to commencement of operation. BACT is required during all phases of remediation of soil contaminated with VOCs. Rule 1166 also sets forth testing, record keeping and reporting procedures that must be followed at all times. Non-compliance with Rule 1166 can result in the revocation of the approved mitigation plan, the owner and/or the operator being served with a Notice of Violation for creating a public nuisance, or an order to halt the offending operation until the public nuisance is mitigated to the satisfaction of the Executive Officer.

Los Angeles Municipal Code (Fire Protection – Chapter 5, Section 57, Divisions 4 and 5): The Los Angeles Municipal Code, Chapter 5, Section 57, Divisions 4 and 5 regulate the construction of buildings and other structures used to store flammable hazardous materials, and the storage of these same materials. These sections ensure that the business is properly equipped and operates in a safe manner and in accordance with all applicable laws and regulations. These permits are issued by the Los Angeles Fire Department.

Los Angeles Municipal Code (Public Property – Chapter 6, Article 4): The Los Angeles Municipal Code, Chapter 6, Article 4, regulates the discharge of materials into the sanitary sewer and storm drains. It requires the construction of spill-containment structures to prevent the entry of forbidden materials, such as hazardous materials, into sanitary sewers and storm drains.

City of Carson (Los Angeles County Fire Department (LACFD)): Fire protection services within the City of Carson are provided by the LACFD. The LACFD employs two units to respond to on-site hazardous materials incidents: a Petroleum Chemical Unit and a Hazardous Materials Division. The Petroleum Chemical Unit employs six inspectors managed by a Captain and Battalion Chief, who are tasked with enforcing the Los Angeles County Fire Code. The inspectors provide infrastructure design review and approval, as well as inspection services for oil infrastructure projects. The Petroleum Chemical Unit requires submittal of a Hazardous Materials Business Plan, including a Site Mitigation Plan, during the project approval process. Inspections include ensuring proper operation of all equipment and facilities.

In the event of an explosion on-site, the Health Hazardous Material Division of the LACFD would respond. All Hazardous Material Specialists employed by the LACFD are sworn and badged Los Angeles County Deputy Health Officers. The Health Hazardous Materials Division of LACFD is responsible for protecting public health and the environment from accidental releases and improper handling, storage, transportation, and disposal of hazardous materials and wastes through coordinated efforts of inspections, emergency response, enforcement, and site mitigation oversight.

The Health Hazardous Materials Division is a CUPA and can administer the following programs throughout the County: (1) Hazardous Waste Generator Program; (2) Hazardous Materials Release Response Plans and Inventory Program; (3) California Accidental Release Prevention Program; (4) Above Ground Storage Tank Program, and (5) Underground Storage Tank Program. The CUPA for the City of Carson is the County of Los Angeles. Therefore, the County of Los Angeles Health Hazardous Materials Division is the CUPA for the Tesoro Carson Operations. The City of Los Angeles Fire Department is the CUPA for the Tesoro Wilmington Operations.

3.4 HYDROLOGY AND WATER QUALITY

Water issues in Los Angeles County are complex and affect supply, demand and quality of water for domestic, commercial, industrial and agricultural use. Water impacts also include the quality and availability of water for the ecosystems in the region. Extensive urbanization in the Carson/Wilmington area has resulted in significant alteration and deterioration of the natural hydrologic environment. Presently, surface runoff flows onto a network of storm drains that empty into the conduits of the Dominguez Channel and the Los Angeles River. Due to extensive paving and surfacing of the land throughout the area, groundwater recharge by infiltration has steadily decreased while pumping has increased. This imbalance has likely contributed to the contamination of groundwater basins by saltwater intrusion.

3.4.1 REFINERY WATER USE AND WASTEWATER GENERATION

Water is used in many of the refining processes at the facility including crude desalting, cooling towers, and steam generation, as well as drinking water/sanitation and fire suppression. The Refinery uses various sources of water to meet these needs. Water is purchased from municipal water purveyors, pumped from wells within the Refinery, as well as recycled for use by the Carson and Wilmington Operations.

Wastewater streams discharged from the Carson and Wilmington Operations include process wastewater, cooling tower blowdown, blowdown streams from the boiler feedwater treatment system, storm water runoff, and sanitary sewage.

3.4.2 EXISTING REFINERY WATER USE AND WASTEWATER GENERATION

3.4.2.1 Refinery Well Water Supply

Tesoro, as an owner of private wells, has been granted water rights by the State (referred to as adjudicated water rights). The adjudicated water rights are published in the Watermaster Service in the West Coast Basin report, which is published annually by the California Department of Water Resources (DWR). The Tesoro Los Angeles Refinery has adjudicated rights to 8,741 acre feet per year (2.8 billion gallons per year) (as reported in Table 2 of the Watermaster Service report for 2012, Party ID 7025 rights of 5,309 acre feet for the Carson Operations + Party ID 7807 rights of 3,432 acre feet for the Wilmington Operations = 8,741 acre feet) (DWR, 2012). Unused water rights can be carried over from year to year as allowed by permit. The annual accounting of water usage of adjudicated water rights is presented in the Watermaster Service in the West Coast Basin report in Table 2 each year.

3.4.2.2 Carson Operations

3.4.2.2.1 Water Use

The Carson Operations obtains its water from a combination of sources including: 1) purchased potable water from the California Water Service via various well sources; 2) non-potable service water from Carson Operations owned wells; and 3) recycled water. In 2012, the Carson Operations used about 4,591 million gallons of water which was used in many of the refining support processes such as the crude desalting units, cooling towers, and steam generators. Of this amount, approximately 2,648 million gallons were potable water (municipal), 253 million gallons came from the Carson Operations owned wells (groundwater), and 1,690 million gallons were recycled water. In 2013, the Carson Operations used about 4,485 million gallons of water. Of this amount, approximately 2,399 million gallons were potable water, 511 million gallons came from Carson Operations owned wells, and 1,575 million gallons were recycled water. The summary of water use at the Carson Operations is provided in Table 3.4-1.

TABLE 3.4-1

Carson and Wilmington Operations
Annual Water Use (Million Gallons of Water)

Water Source	2012	2013
Wilmington Operations		
Municipal	577	912
Groundwater	1,504	1,005
Recycled	--	--
Total	**2,081**	**1,917**
Carson Operations		
Municipal	2,648	2,399
Groundwater	253	511
Recycled	1,690	1,575
Total	**4,591**	**4,485**
Sulfur Recovery Plant		
Municipal	4	9
Groundwater	118	103
Recycled	--	--
Total	**122**	**113**
Tesoro Los Angeles Refinery Total Water Use		
Municipal	3,230	3,320
Groundwater	1,875	1,620
Recycled	1,690	1,575
Total[(a)]	**6,795**	**6,515**

Source: DWR, 2011 – 2013
(a) Based on data provided by Tesoro. Update to Watermaster Service Report in process

The California Water Code requires all urban water suppliers that provide water for municipal purposes either directly or indirectly to more than 3,000 customers (or supply more than 3,000 acre-feet of water annually) to prepare Urban Water Management Plans at least every five years. The plans describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation, and address measures for residential, commercial, governmental, and industrial water demand management.

The most recent Urban Water Management Plan prepared for the CWS was approved in 2010 (CWS, 2011). The adjudicated water rights that are owned by the Tesoro and used at the Carson Operations are included in the Urban Water Management Plan prepared for the CWS. The population served by the CWS is about 144,190 residents in the South Bay portion of Los Angeles County. Residential water demand accounts for 31.2 percent of total water demand. Industrial services account for 27.2 percent of the total water demand. Commercial uses account for 18.1 percent of the total water demand. Government uses, recycled water, other and unaccounted for water comprise the remaining water demand. Total water demand in the CWS service area was 32,364 acre-feet of water in 2010. Projected water demand is expected to be 32,985 acre-feet in 2015 and 30,230 acre-feet in 2020. Groundwater generally supplies approximately 25 percent of the annual demand. Purchased water from West Basin Municipal Water District satisfies about 65 percent of the water demand within the West Basin Municipal Water District, and recycled water makes up the remaining 10 percent. The existing supply facilities and operations are adequate to provide for projected demand through the year 2040. CWS is placing more emphasis on enhancing and developing facilities that shift reliance toward the use of local water supplies (groundwater and recycled water).

3.4.2.2.2 Wastewater Generation

Wastewater streams from the Carson Operations include process wastewater, boiler blowdown, sanitary wastewater, and surface runoff. Process wastewater streams are treated by the Carson Operation's existing wastewater treatment facilities prior to discharge to the LACSD sewer system; the sanitary wastewater stream is discharged directly to the sewer without prior treatment. Wastewater from the Carson Operations is treated and sampled in compliance with the LACSD Industrial Wastewater Discharge Permit[1]. The LACSD places limitations on wastewater parameters such as oil and grease contents, pH levels, temperature, heavy metals, organic compounds and other constituents. Wastewater that complies with the LACSD permit requirements is discharged to the sewer. Wastewater that does not comply is returned to the wastewater treatment system for further treatment.

The Carson Operations is also permitted to discharge stormwater commingled with treated process water to Dominguez Channel. The Carson Operation's stormwater permit contains mass limits for stormwater discharge to the channel based on a certain flow volume, but does not set volume limits per se. If concentrations of contaminants are lower than permit limits, the Carson Operations can discharge more water without exceeding the permit mass limits. However, if concentrations are higher than permit limits, then discharge volumes must be lower to avoid exceeding the permit mass limits. Though the Carson Operations is permitted to discharge 4.4 million gallons per day of boiler blowdown to Dominguez Channel, no boiler blowdown is currently discharged to the channel. The location where the Carson Operations can discharge to the channel is at an outfall point approximately 2,200 feet west of the Alameda Street Bridge.

The Carson Operations discharged an average of 4.07 million gallons per day of wastewater during 2012 and 2013 to the sewer system. The Carson Operation's current Industrial

[1] Carson Operations' Industrial Wastewater Discharge Permit is separate from the Wilmington Operations' Wastewater Discharge Permit.

Wastewater Discharge Permit allows discharge of up to 5.25 million gallons per day to the LACSD sewer system.

3.4.2.2.3 Surface Water Runoff

The Carson Operations is located on the Dominguez Channel, approximately three miles north of the Cerritos Channel, and approximately 1.5 miles west of the Los Angeles River. The Los Angeles River and the Dominguez Channel are the major drainages that flow into the Los Angeles-Long Beach Harbor complex. Sediments and contaminants are transported into the harbor with the flows from the Los Angeles River and, to a lesser degree, the Dominguez Channel.

The Los Angeles River drains an 832-square mile watershed basin, into the Long Beach Harbor. The Los Angeles River watershed is controlled by a series of dams, and an improved river channel with a design flow capacity of 146,000 cubic feet per second.

The Dominguez Channel originates in the area of the Los Angeles International Airport and flows southward into the East Channel of the Los Angeles Harbor. The Dominguez Channel, an 8.5-mile long structure, drains approximately 80 square miles of watershed west of the Los Angeles River drainage basin. Permitted discharges from industrial sources are a substantial percentage of the persistent flows in the Dominguez Channel. Water quality objectives and beneficial uses for the Dominguez Channel tidal prism have been established by the RWQCB, Los Angeles Region, in the Water Quality Control Plan for the Los Angeles River Basin (1994).

Runoff from the Carson Operations is collected, treated (if applicable), and discharged under the requirements of the existing storm water permit, NPDES permit, or the Industrial Wastewater Discharge Permit. Surface water streams are treated by the Carson Operation’s existing wastewater treatment facilities prior to discharge to the LACSD sewer system.

3.4.2.3 Wilmington Operations

3.4.2.3.1 Water Use

Potable water is supplied to the Wilmington Operations by the LADWP. The Wilmington Operations is located in the LADWP's Harbor Area Water Service District and all potable water in the area is purchased by the LADWP from the Metropolitan Water District. Potable water currently enters the Wilmington Operations via a ten-inch fire service line that stems off a 12-inch main line.

In 2012, the Wilmington Operations used about 2,081 million gallons of water which was used in many of the refining support processes. Of this amount, approximately 577 million gallons were potable water, and 1,504 million gallons were from Wilmington Operations owned wells. In 2013, the Wilmington Operations used about 1,917 million gallons of water. Of this amount, approximately 912 million gallons were potable water and 1,005 million gallons came from Wilmington Operations owned wells. The Wilmington Operations is not connected to any pipelines supplying recycled water, so it does not use recycled water in any units or processes. The summary of water use at the Wilmington Operations is provided in Table 3.4-1.

Potable water is supplied to the Wilmington Operations Sulfur Recovery Plant (SRP), which is physically located in the City of Carson, by the California Water Service. In 2012, the SRP used about 122 million gallons of water in many of the SRP support processes. Of this amount, approximately 4 million gallons were potable water, and 118 million gallons were from Wilmington Operations owned wells. In 2013, the SRP used about 113 million gallons of water in many of the SRP support processes. Of this amount, approximately 9 million gallons were potable water, and 103 million gallons were from Wilmington Operations owned wells. The summary of water use at the SRP is provided in Table 3.4-1.

The most recent Urban Water Management Plan for the LADWP was approved in 2010. The adjudicated water rights that are owned by Tesoro and used at the Wilmington Operations are included in the Urban Water Management Plan prepared for LADWP. The population within LADWP's service area was about 4.1 million in 2009, which represents an average annual growth rate of about 1.3 percent, with an average annual growth rate in housing units of 0.9 percent. The average annual water demand from 2005-2010 in the LADWP service area was 621,458 acre-feet (LADWP, 2011). Single-family residential water use comprises the largest category of demand in LADWP's service area, representing about 36 percent of the total. Multifamily residential water use is the next largest category of demand representing about 29 percent of the total. Industrial use is the smallest category, representing only four percent of the total water demand. Projected total water demand (assuming passive water conservation) was 614,794 acre-feet in 2015, and 652,012 acre-feet in 2020. LADWP has set a water conservation goal to further reduce potable water demands an additional 64,000 acre-feet per year by 2035. LADWP concluded that they will be able to reliably provide water to its customers through 2035 (LADWP, 2011).

3.4.2.3.2 Wastewater Generation

The Wilmington Operations discharged an average of 2.88 million gallons per day of wastewater based on a 2012/2013 average. The Wilmington Operation's current Industrial Wastewater Discharge Permit allows discharge of 3.24 million gallons per day. The Wilmington Operations maintains on-site wastewater treatment equipment. Wastewater from the Wilmington Operations is treated and sampled in compliance with the LACSD Industrial Wastewater Discharge Permit. The LACSD places limitations on wastewater parameters including oil and grease, pH, temperature, heavy metals, organic compounds and so forth. Wastewater that complies with the LACSD permit requirements is discharged to the sewer. Wastewater that does not comply is returned to the on-site wastewater treatment equipment for further treatment. The Wilmington Operations' sanitary wastewater stream (e.g., from administration and office buildings) is discharge directly to the sewer without prior treatment.

Wastewater streams from the Wilmington Operations SRP include process wastewater, boiler blowdown, sanitary wastewater and surface runoff. Process wastewater streams are collected and transferred to the Wilmington Operations for treatment prior to discharge to the LACSD.

3.4.2.3.3 Surface Water Runoff

The Wilmington Operations is located immediately east of the Dominguez Channel, less than one-half mile north of the Cerritos Channel and approximately 1.3 miles west of the Los Angeles River. See Section 3.4.2.2.3 for additional information on Los Angeles River and Dominguez Channel. Runoff is collected, treated (if applicable), and discharged under the requirements of the existing storm water permit, NPDES permit, or the Industrial Wastewater Discharge Permit. Surface water streams are treated at existing Refinery wastewater treatment facilities prior to discharge to the LACSD sewer system.

Runoff from the Wilmington Operations SRP is collected, treated (if applicable), and discharged under the requirements of the existing storm water permit, NPDES permit, or the industrial wastewater discharge permit. Surface water streams are treated by Wilmington Operation's existing wastewater treatment facilities prior to discharge to the LACSD sewer system.

3.4.3 REGULATORY BACKGROUND

The regulations applicable to surface water hydrology and groundwater quality are addressed in this section.

3.4.3.1 Federal

3.4.3.1.1 Clean Water Act

The Clean Water Act (CWA) is the primary federal law that protects the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. It operates on the principle that all discharges into the nation's waters are unlawful unless specifically authorized by a permit. Permit review is the CWA's primary regulatory tool. The permits regulate the discharge of dredged and fill materials (CWA Section 404), prevention and response to spills of hazardous materials, construction-related stormwater discharges (CWA Section 402), and activities that may result in the discharges of pollutants (CWA Section 401) into designated "waters of the United States," which include oceans, bays, rivers, streams, lakes, ponds, and wetlands. The proposed project site does not have any designated waters of the United States or wetlands located within its boundaries.

Although the proposed project site does not have any water bodies designated as waters of the United States, and runoff from the proposed project would not drain directly into any identifiable waters of the United States, CWA sections 401 and 402 are still relevant to the proposed project, as discharge into downstream water bodies designated as waters of the United States is still possible. Section 402 is enforced through the NPDES permitting process. The authority to implement CWA provisions has been delegated to the State of California, with oversight by the U.S. EPA. See Section 3.4.3.1.2 and 3.4.3.2.2 for more information.

Section 311 of the Clean Water Act addresses oil spill prevention. The Oil Pollution Prevention regulation sets forth requirements for prevention of, preparedness for, and response to oil discharges at specific non-transportation-related facilities. To prevent oil from reaching navigable waters and adjoining shorelines, and to contain discharges of oil, the regulation requires regulated facilities to develop and implement SPCC Plans and establishes procedures, methods, and equipment requirements. In 1990, the Oil Pollution Act amended the Clean Water Act to require some oil storage facilities to prepare Facility Response Plans. On July 1, 1994, U.S EPA finalized the revisions that direct facility owners or operators to prepare and submit plans for responding to a worst-case discharge of oil.

3.4.3.1.2 State of California Storm Water Pollution Prevention Plan

The U.S. EPA has delegated the authority to implement the CWA to the State of California, but continues to monitor the State program for compliance with federal rules. Pursuant to the CWA, NPDES permits are issued to municipal and industrial dischargers. In compliance with Section 402(p) of the CWA, the U.S. EPA also established regulations that require that stormwater discharges from soil disturbance (excavation, demolition, grading, and clearing) of one acre or more be regulated as an industrial activity and covered by a NPDES permit. Stormwater discharges from a construction activity that results in a land disturbance of less than one acre, but which is a part of a larger common plan of development, also require a permit under the CWA.

The SWRCB has adopted one statewide general permit for almost all stormwater discharges; with the exception of Indian lands and lands within the Lake Tahoe Hydrologic Unit. This general permit is implemented and enforced by the SWRCB. To comply with the permit, landowners initiating construction activities on their properties must:

- Eliminate or reduce non-stormwater discharges to stormwater sewer systems and other waters of the nation;
- Develop and implement a Stormwater Pollution Prevention Plan emphasizing stormwater "Best Management Practices;" and,
- Perform inspections of stormwater pollution prevention measures to assess their effectiveness.

3.4.3.1.3 Safe Drinking Water Act

The Safe Drinking Water Act sets drinking water standards throughout the country and is administered by the U.S. EPA. These drinking water standards are referred to as the National Primary Drinking Water Regulations, and are set forth in 40 CFR Part 141, and the National Secondary Drinking Water Regulations, 40 CFR Part 143. These regulations set maximum contaminant levels (MCLs) for substances including naturally-occurring and man-made contaminants in drinking water.

3.4.3.2 State Regulations

3.4.3.2.1 Environmental Protection Regulations

Regulations governing the environmental protection program of the Department of Oil, Gas, and Geothermal Resources (DOGGR) are provided for in Section 3106 of Division 3 of the Public Resources Code. The requirements of this subchapter cover aboveground and production facilities including sumps; channels; secondary containment; tank construction, maintenance, and testing; pipelines; disposal of oilfield wastes; maintenance and monitoring of production facilities, safety systems, and equipment; and site restoration.

3.4.3.2.2 Porter-Cologne Water Quality Control Act (California Water Code)

The Porter-Cologne Water Quality Control Act, embodied in the California Water Code, establishes the principal California legal and regulatory framework for water quality control. The Porter-Cologne Act protects groundwater and surface water for use by the people of the State. The California Water Code authorizes the SWRCB and the RWQCBs to implement the provisions of the federal Clean Water Act. Based on the SWRCB procedures, the RWQCBs develop local water quality control plans. Once approved by the SWRCB, these local plans are incorporated into the California Water Plan.

Construction Storm Water General Permit: Dischargers whose projects disturb one or more acres of soil or whose projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity Construction General Permit Order 2009-0009-DWQ. The permit is issued by the SWRCB. Construction activity subject to this permit includes clearing, grading, and disturbances to the ground such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP must list Best Management Practices (BMPs) the discharger will use to protect stormwater runoff and the placement of those BMPs. Additionally, the SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

Industrial Stormwater General Permit: The Industrial Storm Water General Permit Order 97-03-DWQ (General Industrial Permit) is an NPDES permit that regulates discharges associated with 10 broad categories of industrial activities. The permit requirement is implemented through the SWRCB. The General Industrial Permit requires the implementation of management measures that will achieve the performance standard of best available technology economically achievable and best conventional pollutant control technology. The General Industrial Permit also requires the development of a SWPPP and a monitoring plan. Through the SWPPP, sources of pollutants are to be identified and the means to manage the sources to reduce stormwater pollution are described. The General Industrial Permit requires that an annual report be submitted.

NPDES Permit: The NPDES Permit Program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Individual permits may be issued to users that do not meet the general stormwater permit requirements or intend to discharge waters other than stormwater. The permit sets limits on the concentrations and total quantity of pollutants that can be discharged from any permitted discharge point. The authority to issue and enforce NPDES permits has been delegated to the Regional Boards, with oversight by the SWRCB. The proposed project is not expected to have operational discharges into waters of the United States.

3.4.3.2.4 Groundwater Quality

The quality of groundwater delivered for public supply is also regulated under the California Domestic Water Quality and Monitoring Regulations found in 22 CCR Division 4, Chapter 15. These regulations identify primary and secondary drinking water standards for public drinking water supplies in the state.

3.4.3.3 Local

3.4.3.3.1 County NPDES Permit

In compliance with the County of Los Angeles NPDES Permit, Title 12.80 - Environmental Protection Code, and Title 26 - Building Code, all construction sites are required to implement BMPs to control erosion, debris, and construction-related pollutants. BMPs that can potentially be implemented are described in the County of Los Angeles Contractor's Guide to Best Management Practices (County of Los Angeles, 2009).

The NPDES permit requires that a Local Storm Water Pollution Prevention Plan (LSWPPP) and a Wet Weather Erosion Control Plan (WWECP) be developed and implemented on construction projects. LSWPPPs include year-round BMP measures that must be incorporated into the construction plans and activities where the disturbed area is one-acre or more. The LSWPPP plan must include appropriate BMPs for general site management, construction materials and waste management, and erosion and sediment controls.

A WWECP must be developed and submitted (or revised) every year to reflect site conditions at the start of the rainy season (October 15). The WWECP addresses erosion and sediment control during wet season operations. Details for WWECP may be included in the LSWPPP or submitted as a separate plan.

3.4.3.3.2 County Standards for Drainage

RWQCB Order Number 01-182, NPDES Permit No. CAS004001 (MS4 Permit) most recently amended April 11, 2011, sets requirements for the Los Angeles County Flood Control District

(LACFCD), the County of Los Angeles, and the incorporated cities within the LACFCD, including Carson, for area-wide urban stormwater runoff.

The MS4 Permit requires post-construction BMPs to be implemented for new development and significant redevelopment, for both private and public agency projects. The MS4 Permit requires that BMPs be implemented to meet the requirements of the order and also specifies the maintenance of those BMPs post-construction.

The City of Carson requires that a Standard Urban Storm Water Mitigation Plan (SUSMP) be developed for each construction project which meets the requirements under the Los Angeles County NPDES permit through implementation of the City's Subdivision and Engineering Design Manual, Division Two, Standards for Drainage (Chapter 2.1, General). The general purpose of the standards is to convey and dispose of water generated by storms, springs, or other sources in such a manner that adjacent improvements, existing or projected, would be free from 10-, 25-, or 100-year storm events. The standards require that each improvement be designed so as not to increase the flow of water onto adjacent properties except as otherwise provided by the standards. Increased flow is permissible by the standards if the City Engineer finds that the developer has furnished downstream facilities of adequate design.

Additionally, the County NPDES permit requires that stormwater runoff be infiltrated or treated. The design volume for infiltration or treatment can be measured several ways. Each of the alternative measures is roughly equivalent to the 0.75-inch storm event (the 85-year storm event).

3.4.3.3.3 City of Carson General Plan

Specific goals and policies in the City of Carson General Plan are related to water conservation, balancing competing demands for water, and protecting the quality of groundwater and surface water resources. Implementation programs that are relevant to the proposed project comprise: (1) supporting the provision of adequate wastewater collection systems and treatment reclamation and disposal facilities that would prevent groundwater degradation by on-site wastewater systems, and (2) supporting additional water conservation measures and programs of benefit to the planning area. As previously noted in the NOP/IS, the proposed project is not expected to conflict with the City of Carson's General Plan, including any goals and/or policies related to water demand or water resources.

3.4.3.3.4 City of Los Angeles General Plan

Requirements for wastewater, stormwater, and water supply for the Wilmington Operations are called out in the Framework Element of the Los Angeles General Plan. Chapter 9: Infrastructure and Public Services, details the requirements applicable to the proposed project. The policies of the Framework Element in all instances are to seek solutions to public infrastructure and service deficiencies, including their expansion commensurate with the levels of demands experienced. In order for the City to provide services that the public expects, it must manage the infrastructure and public services in a manner that avoids depletion or permanent damage of its natural resources. The City must then take four interrelated actions: (a) re-examine the viability of the existing infrastructure relative to its sustainability; (b) maintain a balance between the rate of population and economic growth and the infrastructure and public services necessary to support that growth; (c) correct deficiencies in these support systems; and (d) coordinate the work of policy implementing agencies so they may better support each other.

3.5 NOISE

Noise is a by-product of urbanization and there are numerous noise sources and receptors in an urban community. Noise is generally defined as unwanted sound. The range of sound pressure perceived as sound is extremely large. The decibel is the preferred unit for measuring sound since it accounts for these variations using a relative scale adjusted to the human range for hearing (referred to as the A-weighted decibel or dBA). The A-weighted decibel is a method of sound measurement which assigns weighted values to selected frequency bands in an attempt to reflect how the human ear responds to sound. The range of human hearing is from 0 dBA (the threshold of hearing) to about 140 dBA which is the threshold for pain. Examples of noise and their A-weighted decibel levels are shown in Figure 3.5-1.

In addition to the actual instantaneous measurements of sound levels, the duration of sound is important since sounds that occur over a long period of time are more likely to be an annoyance or cause direct physical damage or environmental stress. To analyze the overall noise levels in an area, noise events are combined for an instantaneous value or averaged over a specific time period. The time-weighted measure is referred to as equivalent sound level and represented by energy equivalent sound level (Leq). The percentage of time that a given sound level is exceeded also can be designated as L_{10}, L_{50}, L_{90}, etc. The subscript notes the percentage of time that the noise level was exceeded during the measurement period. Namely, an L_{10} indicates the sound level is exceeded 10 percent of the time and is generally taken to be indicative of the highest noise levels experienced at the site. The L_{90} is that level exceeded 90 percent of the time and this level is often called the base level of noise at a location. The L_{50} sound (that level exceeded 50 percent of the time) is frequently used in noise standards and ordinances.

3.5.1 TERMINOLOGY USED IN NOISE ANALYSIS

3.5.1.1 Noise Fundamentals

Because all humans perceive and interpret sound differently, the types of sound which comprise noise are subjective. The objectionable nature of sound can be caused by its pitch or its loudness. Pitch of a tone or sound depends on the relative rapidity (frequency) of the vibrations by which it is produced. Loudness is the amplitude of sound waves combined with the reception characteristics of the ear. Amplitude may be compared with the height of an ocean wave. Technical acoustical terms commonly used in this section and Section 4.5 in Chapter 4 are defined in Table 3.5-1.

FIGURE 3.5-1

General Noise Sources and Associated Sound Pressure Levels

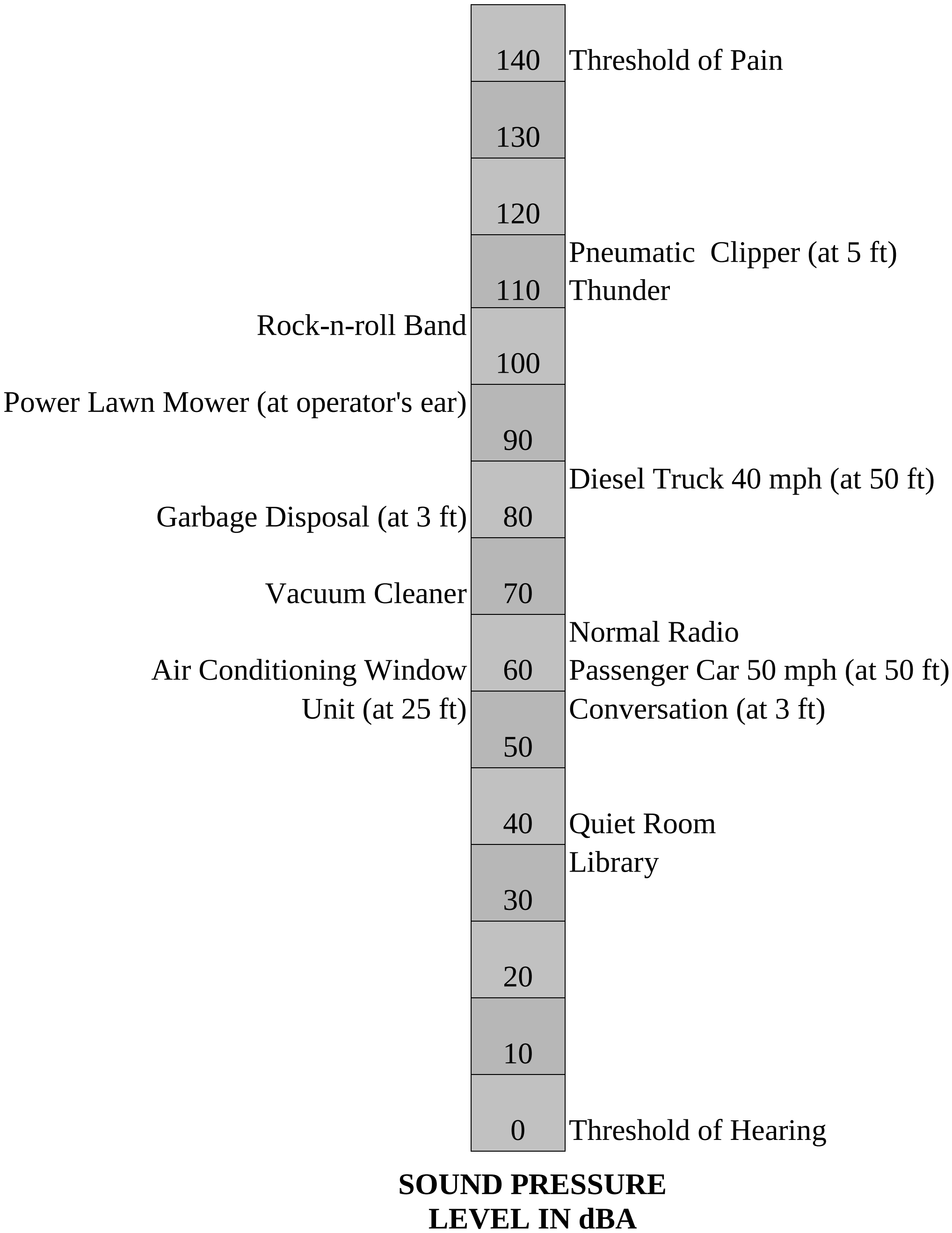

TABLE 3.5-1

Definition of Acoustical Terms

Term	Definition
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
A-Weighted Sound Level (dBA)	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Community Noise Equivalent Level (CNEL)	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and after addition of 10 decibels to sound levels in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level (L_{dn})	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 p.m. and 7:00 a.m.
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro Pascals.
Equivalent Noise Level (L_{eq})	The average A-weighted noise level during the measurement period.
Frequency (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sounds are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, and tonal or informational content as well as the prevailing ambient noise level.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1 percent, 10 percent, 50 percent, and 90 percent of the time during the measurement period.
L_{max}, L_{min}	The maximum and minimum noise levels during the measurement period.
Loudness	The amplitude of sound waves combined with the reception characteristics of the human ear.
Pitch	The height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced.
SEL	Sound Exposure Level is a measure of cumulative noise exposure of a noise event expressed as the sum of the sound energy over the duration of a noise event, normalized to a one-second duration.
Sound Pressure	Sound pressure or acoustic pressure is the local pressure deviation from the ambient atmospheric pressure caused by a sound wave. Sound pressure can be measured using a microphone. The unit for sound pressure (p) is the Pascal [symbol: Pa or 1 Newton exerted over an area of 1 square meter (N/m^2).
Sound Pressure Level	The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro Pascals in air). Sound pressure level is the quantity that is directly measured by a sound level meter.
Vibration	Vibration means mechanical motion of the earth or ground, building, or other type of structure, induced by the operation of any mechanical device or equipment. The magnitude of vibration is stated as the acceleration in “g” units (1 g is equal to 32.2 feet/second^2 or 9.3 meters/second^2).

3.5.1.2 Decibels and Frequency

Environmental noise is measured on a logarithmic scale in decibels (dB). Decibels measure the relative magnitude of pressure fluctuations in a sound medium under the influence of a vibratory source. An increase of 10 decibels represents a 10-fold increase in acoustic energy, which is perceived by people as approximately a doubling of loudness over a wide range of amplitudes. Since decibels are logarithmic units, sound pressure levels are not added arithmetically. When two sounds of equal sound pressure level are added, the result is a sound pressure level that is three dB higher. For example, 60 dB plus 60 dB equals 63 dB. However, where noise levels differ, there may be little change in comparison to the louder noise source; for example when 70 dB and 60 dB sources are added, the resulting noise level equals 70.4 dB.

Because of the nature of the human ear, a sound must be about 10 dBA greater than the reference sound to be judged twice as loud. In general, a three to five dBA change in community noise levels starts to become noticeable, while one to two dBA changes are generally not perceived.

The frequency of a sound wave is the number of times in one second that the sound wave is repeated (i.e., the number of cycles per second). Frequency is designated by a number, and is expressed by the unit Hertz (Hz). The frequency range over which a healthy, young person is capable of hearing is approximately 20 Hz at the low frequency end to 20,000 Hz at the high frequency end.

Because the human hearing system is not equally sensitive to sound at all frequencies, the A-weighted filter system is used to express measured sound levels, in units of dBA, based on the sensitivity of the human ear. The dBA scale emphasizes mid- to high-range frequencies and de-emphasizes the low frequencies to which human hearing is less sensitive. Figure 3.5-1 shows typical A-weighted exterior and interior noise levels that occur in human environments.

Because A-weighted sound levels are adjusted to the sensitivity of the human ear, they are commonly used to quantify noise events and environmental noise. However, community response also depends on the existing ambient sound level, magnitude of sound with respect to the background noise level, duration of the sound, repetitiveness, number of events, and time of day.

3.5.1.3 Vibration Fundamentals

Vibration is an oscillatory motion in a solid medium that can be described in terms of displacement, velocity, and acceleration. With a vibrating floor, for example, the displacement is simply the vertical distance that a point on the floor moves away from its static position. The velocity represents the instantaneous speed of the floor movement, while acceleration is the rate of change of that speed. In an environmental setting, vibratory motion will most often propagate through the soil, and can potentially affect humans, structures, and equipment. The effects of ground vibration are dependent on the source and amplitude of vibration, source to receptor distance, soil conditions, and receptor characteristics.

3.5.2 EXISTING REFINERY NOISE SETTING

The vicinity of the proposed project is an urban environment characterized by extensive industrial, commercial, transportation-related and some residential land uses. The existing noise environment at the Refinery and in the vicinity of the Refinery is dominated by refining operations and mobile sources including trucks, cranes, locomotive engines, and other heavy industrial activities. Noise sources in the area currently include: (1) mobile and stationary sources at the Wilmington and Carson Operations; (2) rail traffic and related maintenance and service activities at adjacent railyards; (3) noise from adjacent industrial facilities; (4) the Alameda Corridor; and (5) traffic along the Terminal Island Freeway, Interstate 405 Freeway, Pacific Coast Highway, and other local streets, e.g., Alameda Street, Wilmington Avenue, and Sepulveda Boulevard. The demolition of existing facilities, construction of the proposed project, increases in truck and rail traffic, and modernization activities at the proposed project site could potentially result in increases in noise levels.

Traffic, both vehicular and railroad, is a major source of noise in the area. The Interstate 405 Freeway is a major noise source at the site since it is elevated above most buildings; therefore, the traffic noise is not attenuated as quickly as noise generated at ground level. Railroad tracks associated with the Alameda Corridor are located along the eastern boundary of the Carson Operations and west of the Wilmington Operations. Locomotive engines and trains using the railroad tracks are a source of noise in the area.

3.5.2.1 Sensitive Receptors

Noise-sensitive receptors or receivers are defined as residences, schools, hospitals, libraries, places of worship, and public parks. Although there are numerous sources of noise in the area, there are few sensitive receptors. The closest noise sensitive receptors to the proposed project locations within the Refinery are residential areas:

- Approximately 200 feet west of the Wilmington Operations (south of Pacific Coast Highway, between Alameda Street and Blinn Avenue).

- West of the Carson Operations (west of Wilmington Avenue, south of Sepulveda Boulevard and north of Lomita Boulevard) approximately 100 feet from the Carson Crude Terminal property boundary and 1,300 feet from the proposed crude oil tanks location.

There are numerous commercial and industrial receptors located adjacent to both Wilmington and Carson Operations, as well as numerous industrial receptors. See Section 2.4.1 for a description of commercial and industrial land uses adjacent to the Wilmington Operations and Section 2.4.2 for a description of commercial and industrial land uses adjacent to the Carson Operations.

3.5.2.2 Noise Monitoring

The principle noise sources in an industrial area are impact, friction, vibration, and air turbulence from air and gas streams. Process equipment, heaters, cooling towers, pumps and compressors, contribute to noise emitted from stationary sources at the Refinery. The major noise sources within the Refinery are associated with the main processing units. Rail, truck and vehicle traffic are also major noise sources in the vicinity of the Tesoro Los Angeles Refinery.

Noise monitoring for the Refinery was conducted in August and September 2014 within or adjacent to sensitive receptor locations, i.e., residential areas (see Appendix D for further details on noise monitoring activities). This timeframe is representative of the facility as it operated in 2012 and 2013 as no major modifications to the Tesoro Los Angeles Refinery and no major construction activities have occurred at adjacent facilities. Therefore, noise monitoring in 2014 is believed to be representative of baseline noise levels in 2012 and 2013. Noise monitoring was conducted over a 24-hour period adjacent to the closest residential areas to the Carson and Wilmington Operations as described in Table 3.5-2. The noise monitoring locations are shown in Figure 3.5-2. A noise survey conducted for the proposed project indicated that there are no immediate residential communities north or northeast of the Refinery, so no noise monitoring was conducted in these areas. (See Appendix D for more information on the noise survey.)

TABLE 3.5-2

Noise Monitoring Locations

Location	Description
1	A residential area on the corner of Merimac Avenue and West Willard Street, approximately 2,000 feet east of the Tesoro Wilmington Operations within the City of Long Beach.
2	An industrial area on the corner of Mauretania Street and Goodrich Avenue, bordering the western boundary of the Tesoro Wilmington Operations within the community of Wilmington. The location is representative of residents adjacent to the Refinery and the residential area west of the Alameda Corridor.
3	A mixed use area on the corner of Drumm Avenue and East Sandison Street, approximately 900 feet west of the Tesoro Wilmington Operations within the community of Wilmington. Residential areas are located immediately southwest of the corner with industrial areas to the north and east.
4	A mixed use area on the corner of Wilmington Avenue and East Pacific Street, bordering the western boundary of the Tesoro Carson Operations within the City of Carson. Residential areas are located west of Wilmington Avenue with the Tesoro Carson Operations to the east.

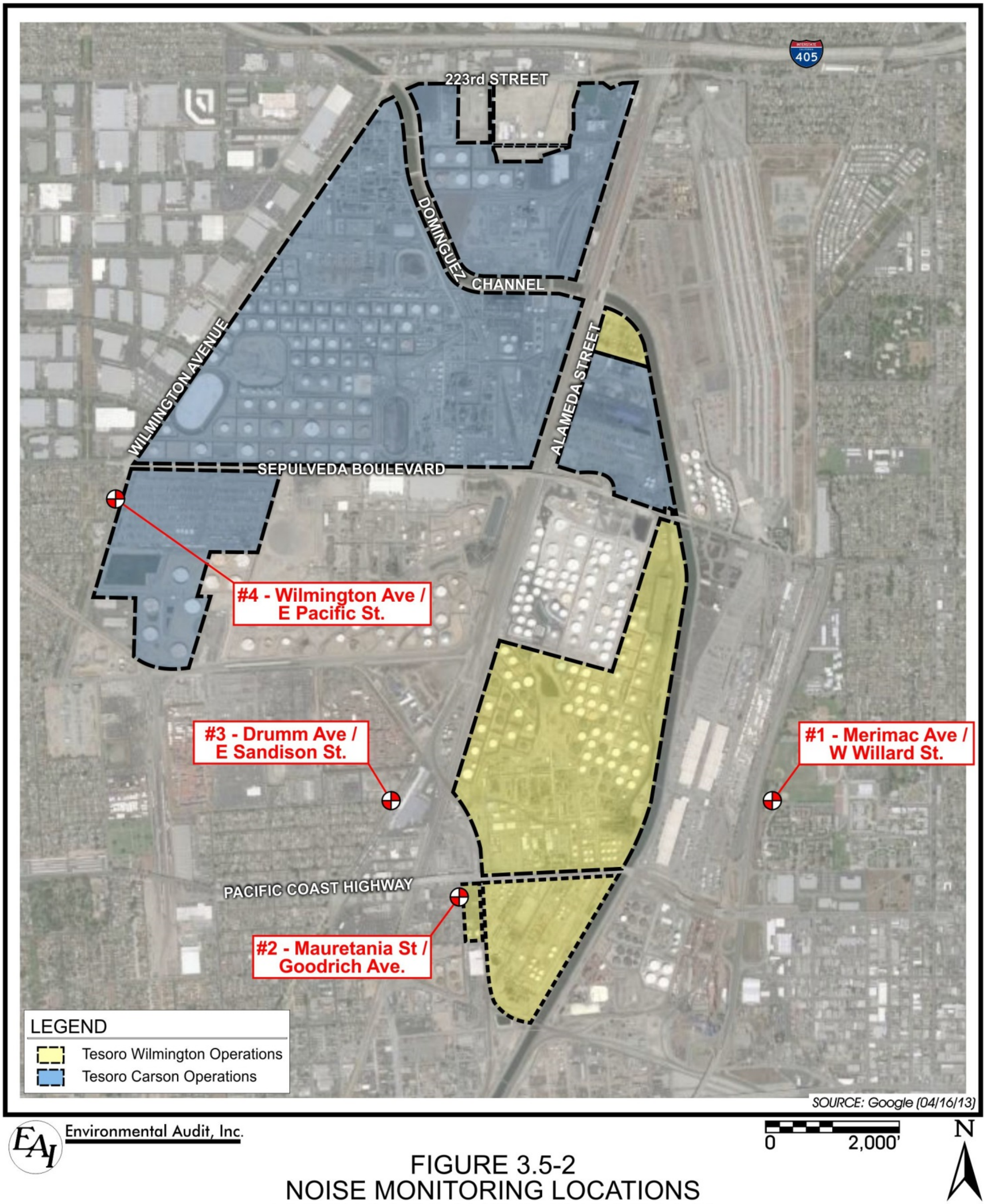

FIGURE 3.5-2
NOISE MONITORING LOCATIONS
TESORO LOS ANGELES REFINERY

Project No. 2844

N:\2844\Noise Monitoring Locations.cdr

The results of the ambient noise measurements are presented in Table 3.5-3. The existing CNELs in the vicinity of the closest residences are 68 to 73 dBA (locations 1, 3, and 4) and are in the "normally unacceptable" range for their land use category (see Table 3.5-4). Location 2 is an industrial area, adjacent to the Wilmington Operations and other industrial sources influenced by traffic noise on Pacific Coast Highway as well as truck and rail traffic on the Alameda Corridor. The CNEL at Location 2 is about 76 dBA, which is in the high range for "conditionally acceptable" land use compatibility guidelines (see Table 3.5-4). See Appendix D for more details on the baseline noise monitoring activities.

TABLE 3.5-3

Existing Noise Levels

Receptor	Location	Existing Noise Levels		
		CNEL	Leq, day[a]	Leq, night[b]
#1	Merimac Avenue/W. Willard Street	72.8	69.2	64.9
#2	Mauretania Street/Goodrich Avenue	76.4	70.1	69.8
#3	Drumm Avenue/E. Sandison Street	72.7	68.4	65.4
#4	Wilmington Avenue/E. Pacific Street	68.2	65.0	60.3

Source: Appendix D, Noise Impact Assessment for the Tesoro LA Refinery Integration and Compliance Project.

(a) The average A-weighted noise level measured during the daytime.

(b) The average A-weighted noise level measured during the nighttime.

3.5.3 REGULATORY BACKGROUND

Occupational noise exposure is regulated at the federal and state levels. Residential noise exposure is regulated at the state and local government levels as discussed in the following subsections.

3.5.3.1 Noise Regulations for Worker Protection

Exposure to employee noise levels is regulated by Cal OSHA and the federal Occupational Safety and Health Administration/National Institute for Occupational Safety and Health (NIOSH). Employers are required to administer a continuing, effective hearing conservation program, whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 dBA (CCR Title 8, Section 5097 and 29 CFR 1910.95(c)). In addition, an employer must institute a training program for all employees who are exposed to noise at or above an 8-hour TWA of 85 dBA (CCR Title 8, Section 5099).

Workers exposed to noise sources in excess of 85 dBA for an eight-hour period will be required to wear hearing protection devices that conform to applicable California regulations (CCR Title 8, Section 5098 and 29 CFR 1910.95(i)). Employers must give employees the opportunity to select their hearing protectors from a variety of suitable hearing protectors, shall provide training in the use and care of hearing protectors, shall ensure proper initial fitting and supervise the correct use of all hearing protectors(CCR Title 8, Section 5098 and 29 CFR 1910.95(i)).

3.5.3.2 State Noise Regulations

The State Department of Aeronautics and the California Commission of Housing and Community Development have adopted the CNEL to measure and regulate noise sources within communities. The CNEL is the adjusted noise exposure level for a 24-hour day and accounts for noise source, distance, duration, single event occurrence frequency, and time of day. The CNEL considers a weighted average noise level for the evening hours, from 7:00 p.m. to 10:00 p.m., increased by five dBA (i.e., an additional five dBA are added to all actual noise measurements), and the late evening and morning hour noise levels from 10:00 :p.m. to 7:00 a.m., increased by 10 dBA (an additional 10 dBA are added to all actual noise measurements). The daytime noise levels are combined with these weighted levels and averaged to obtain a CNEL value. Using this formula, the CNEL weighted average noise level weights noise measurements taken in the evening and nighttime hours more heavily than noise during the daytime. The adjustment accounts for the lower tolerance of people to noise during the evening and nighttime period relative to the daytime period.

3.5.3.3 Local Noise Regulations

The Refinery is located within the City of Carson and the Wilmington District in the City of Los Angeles. As a result, the two operations are subject to slightly different local noise ordinances, as explained in the following subsections.

3.5.3.3.1 City of Los Angeles Municipal Code

Noise regulations applicable to construction activities, repair work, or excavation within Los Angeles are contained in the City of Los Angeles Municipal Code. Section 41.40 of the code establishes times when construction work cannot be performed. The Municipal Code section states the following:

> (a) No person shall between the hours of 9:00 p.m. and 7:00 a.m. of the following day perform any construction or repair work of any kind upon or any excavating for, any building or structure, where any of the foregoing entails the use of any power-driven drill, driven machine, excavator, or any other machine, tool, device, or equipment which makes loud noises to the disturbance of persons occupying sleeping quarters in any dwelling, hotel, or apartment or other place of residence. In addition, the operation, repair or servicing of construction equipment and the jobsite delivering of construction materials in such areas shall be prohibited during the hours herein specified. Any person who knowingly and willfully violates the foregoing provision shall be deemed guilty of a misdemeanor punishable as elsewhere provided in this code.

Chapter 11 of the City of Los Angeles Municipal Code sets forth noise regulations for powered equipment or hand tools. The applicable section regarding construction noise is Section 112.05, which establishes maximum noise levels for powered equipment or powered hand tools. This section states:

Between the hours of 7:00 A.M. and 10:00 P.M. in any residential zone of the City or within 500 feet thereof, no person shall operate or cause to be operated any powered equipment or powered hand tool that produces a maximum noise level exceeding the following noise limits at a distance of 50 feet there from (a) 75 dBA for construction, industrial and agricultural machinery including crawler tractors, dozers, rotary drills and augers, loaders, power shovels, cranes, derricks, motor graders, paving machines, off-highway trucks, ditchers, trenchers, compactors, scrapers, wagons, pavement breakers, depressors, and pneumatic or other powered equipment; (b) 75 dBA for powered equipment of 20 horsepower or less intended for infrequent use in residential areas including chain saws, log chippers, and powered hand tools; and (c) 65 dBA for powered equipment intended for repetitive use in residential areas including lawn mowers, backpack mowers, small lawn and garden tools, and riding tractors.

The noise limits for particular equipment listed above in (a), (b), and (c) shall be deemed to be superseded and replaced by noise limits for such equipment from and after their establishment by final regulations adopted by the Federal Environmental Protection Agency and published in the Federal Register. Said noise limitations shall not apply where compliance therewith is technically infeasible. The burden of proving that compliance is technically infeasible shall be upon the person or persons charged with a violation of this section. Technical infeasibility shall mean that said noise limitations cannot be complied with despite the use of mufflers, shields, sound barriers, and/or other noise reduction device and techniques during the operation of the equipment.

3.5.3.3.2 Wilmington-Harbor City Community Plan

Community plans are intended to promote an arrangement of land uses, streets, and services which will encourage and contribute to the economic, social, and physical health, safety, welfare, and convenience of the people who live and work in the community. The plans are also intended to guide development in order to create a healthful and pleasant environment. Goals, objectives, policies, and programs are created to meet the existing and future needs and desires of the community through future years. The Community Plans are part of the Land Use Element of the City of Los Angeles General Plan, and are intended to coordinate development among the various parts of the City and adjacent municipalities in a fashion both beneficial and desirable to the residents of the community.

The Wilmington-Harbor City Community Plan ensures that sufficient land is designated that provides for the housing, commercial, employment, educational, recreational, cultural, social, and aesthetic needs of the residents of the Wilmington-Harbor City area. The land use designations are designed to help ensure land use compatibility, including noise compatibility based upon the City of Los Angeles General Plan Noise Element.

3.5.3.3.3 City of Los Angeles Noise Element

The City of Los Angeles General Plan Noise Element establishes standards for exterior sound levels based on land use categories. The Noise Element states that the normally acceptable outdoor noise exposure-level for residential, hospital, and school zones is 50 to 70 dBA CNEL and that silencers and mufflers on intake and exhaust openings for all construction equipment are required. Table 3.5-4 summarizes the City's noise compatibility guidelines applicable to a variety of different land use types.

TABLE 3.5-4

City of Los Angeles Land Use Noise Compatibility Guidelines

Land Use	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Single-Family, Duplex, Mobile Homes	50-60	55-70	70-75	Above 70
Multi-Family Homes	50-65	60-70	70-75	Above 70
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-70	60-70	70-80	Above 80
Transient Lodging – Motels, Hotels	50-65	60-70	70-80	Above 80
Auditoriums, Concert Halls, Amphitheaters	--	50-70	--	Above 65
Sports Arena, Outdoor Spector Sports	--	50-70	--	Above 70
Playgrounds, Neighborhood Parks	50-70	--	65-75	Above 72
Golf Courses, Riding Stables, Water, Recreation, Cemeteries	50-75	--	70-80	Above 80
Office Buildings, Business and Commercial	50-70	67-77	Above 75	--
Industrial Manufacturing, Utilities, Agriculture	50-75	70-80	Above 75	--

Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.
Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditional will normally suffice.
Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
Clearly Unacceptable: New construction of development generally should not be undertaken.

Source: City of Los Angeles, 2006.
KEY: NA= Not Applicable
(a) L_{dn} is an average A-weighted noise level during a 24-hour day with 10 dBA added to levels measured between 10 p.m. and 7 a.m. CNEL is similar to L_{dn} except that CNEL also adds 5 dBA to levels between 7 p.m. and 10 p.m.

3.5.3.3.4 City of Carson Municipal Code

Carson's Municipal Code, Ordinance No. 95-1068, limits long-term construction noise (periods of 21 days or more) to 65 dBA in the daytime (7 a.m. to 6 p.m.). In addition, non-urgent and essential construction is generally prohibited without a special permit between 6 p.m. and 7 a.m., and on weekends. If the City Engineer determines that the public health, safety, comfort, and convenience will not be affected during these times, he may grant special permission for certain noise-generating activities.

Carson's ordinance limits operational noise to specific statistical sound levels, L_x, where "L" is the A-weighted sound level that may not be exceeded over "x" percent of the measured time period. The maximum noise level recorded during a noise event is expressed as L_{max}. For example, L_{50} is equal to the level exceeded fifty percent of the time. Carson bases its daytime (7 a.m. to 10 p.m.) limits on a 30-minute period and specifies the limits by zone (Zone 1: Noise Sensitive Areas; Zone 2: Residential; Zone 3: Commercial; Zone 4: Industrial).

Carson operational noise limits are summarized for Zones 2 through 4 (residential, commercial, and industrial) in Table 3.5-5. No areas near the Refinery are designated Zone 1. For residential and commercial areas, nighttime (10 p.m. to 7 a.m.) limits are five dBA lower. If the existing ambient noise level already exceeds these limits, then the noise limit becomes equal to the existing ambient noise level. In addition, interior (indoor) noise levels are limited to 40 dBA nighttime (10 p.m. to 7 a.m.) and 45 dBA daytime, or the existing ambient noise level in residential dwellings whichever is greater. For sources of tonal or impulsive noise, noise ordinance limits are reduced by five dBA.

TABLE 3.5-5

City of Carson Noise Ordinance

Construction Limit (dBA)	**Operations Limit (exterior dBA except where noted)**					
Residential Lmax= 65 (7 a.m. – 6 p.m.)	Residential[(a)(b)]	L_{50}=50	L_{25}=55	$L_{8.3}$=60	$L_{1.7}$=65	L_{max}=70
	Commercial[(a)(b)]	L_{50}=60	L_{25}=65	$L_{8.3}$=70	$L_{1.7}$=75	L_{max}=80
	Industrial[ab]	L_{50}=70	L_{25}=75	$L_{8.3}$=80	$L_{1.7}$=85	L_{max}=90
	Indoor Noise – Residences[(b)]: 45 day; 40 night					

Source: City of Carson Ordinance No. 4101

(a) Residential and commercial nighttime limits (10 p.m. – 7 a.m.) are 5 dBA lower. Tonal or impulsive type noise also reduces limit by 5 dBA.

(b) If ambient noise exceed limit then limit is increased to ambient noise.

Key: L_X – A-weighted sound level, L, that may not be exceeded more than "x" percent of the measured time period.
L_{max} = Maximum A-weighted sound level

3.5.3.3.5 City of Carson Noise Element

The City of Carson General Plan Noise Element establishes a comprehensive program to limit the exposure to the community to excessive noise levels. The Noise Element provides criteria used to assess the compatibility of proposed land uses with the noise environment for all properties within designated noise zones, as shown in Table 3.5-6. The Noise Element also establishes interior and exterior noise standards for land uses within the City and summarizes ambient noise levels within the City (City of Carson, 2004).

TABLE 3.5-6

City of Carson Land Use Noise Compatibility Guidelines

Land Use	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential – Low Density	50-60	60-65	65-75	75-85
Residential - Multiple Family	50-60	60-65	65-75	75-85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-60	60-65	65-80	80-85
Transient Lodging – Motels, Hotels	50-65	65-70	70-80	80-85
Auditoriums, Concert Halls, Amphitheaters	NA	50-65	NA	65-85
Sports Arena, Outdoor Spector Sports	NA	50-70	NA	70-85
Playgrounds, Neighborhood Parks	50-70	NA	70-75	75-85
Golf Courses, Riding Stables, Water, Recreation, Cemeteries	50-70	NA	70-80	80-85
Office Buildings, Business Commercial and Professional	50-67.5	67.5-75	75-85	NA
Industrial Manufacturing, Utilities, Agriculture	50-70	70-75	75-85	NA

Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.
Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
Normally Unacceptable: New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
Clearly Unacceptable: New construction of development should generally not be undertaken.

Source: City of Carson, 2004. Modified from the U.S. Department of Housing and Urban Development Guidelines and State of California Standards.
KEY: NA = Not Applicable

3.6 SOLID AND HAZARDOUS WASTE

3.6.1 SOLID WASTE

Landfills are generally used for the disposal of solid waste and permitted by the local land use agencies. Local agencies establish the maximum amount of solid waste which can be received by a landfill each day and the operational life of a landfill. Landfills are operated by both public and private entities. Landfills are also subject to requirements of the SCAQMD as they pertain to gas collection systems, dust and nuisance impacts.

Landfills throughout the region typically operate between five and seven days per week. Landfill operators weigh arriving and departing deliveries to determine the quantity of solid waste delivered. At landfills that do not have scales, the landfill operator estimates the quantity of solid waste delivered (e.g., using aerial photography). Landfill disposal fees are determined by local agencies based on the quantity and type of waste delivered.

Table 3.6-1 shows data from California Department of Resources Recycling and Recovery (CalRecycle) regarding the number of tons disposed in 2013 (the most recent year for which information is available) for Los Angeles County and the surrounding counties in southern California that are part of the district. Over the past thirteen years, disposal tonnage has decreased substantially in the region as the emphasis on recycling to meet the requirements of AB 939 has served to divert tonnage from landfills and conserve landfill capacity.

TABLE 3.6-1

Solid Waste Disposed in 2013 by County

County	Total Tonnage
Los Angeles	6,322,767
Orange	3,591,316
Riverside	3,223,069
San Bernardino	1,128,123
Total	**14,265,275**

Source: CalRecycle, 2014

In viewing facilities on a county-by-county basis, it is important to note that landfills in one county may import waste generated elsewhere. Currently, Orange County offers capacity to out-of-county waste at a "tipping fee" low enough to attract waste from Los Angeles and San Bernardino counties. Since the enactment of AB 939 in 1989, local governments have implemented recycling programs on a widespread basis, by making efforts to meet the diversion mandates of AB 939. Statewide, CalRecycle reports that diversion increased from 10 percent in 1989 to approximately 65 percent in 2013 (CalRecycle, 2014).

A total of 11 Class III active landfills and two transformation (i.e., refuse to energy) facilities are located within Los Angeles County with a total disposal capacity of 43,648 tons per day and

3,240 tons per day, respectively (see Tables 3.6-2 and 3.6-3). Landfills in Orange County are included in Table 3.6-2 because some waste generated in Los Angeles County is disposed of in Orange County.

TABLE 3.6-2

Class III Landfills and Related Capacity

Name	Permitted Capacity (tons per day) [(a)]
Antelope Valley	1,800
Burbank	240
Calabasas	3,500
Chiquita Canyon	6,000
Lancaster	3,000
Pebbly Beach	49
Puente Hills	13,200
San Clemente	9.6
Scholl Canyon	3,400
Sunshine Canyon City/County	12,100
Whittier (Savage Canyon)	350
Total	**43,648**

Source: County of Los Angeles, 2013
(a) Solid Waste Facility Permit

TABLE 3.6-3

Waste Transformation Facilities and Related Capacity

Facility	County	Permitted Capacity (tons per day)
Commerce Refuse-to-Energy Facility	Los Angeles	1,000
Southeast Resource Recovery Facility	Los Angeles	2,240
Total		**3,240**

Source: County of Los Angeles, 2013

3.6.1.1 Los Angeles County

The Los Angeles Countywide Siting Element addresses landfill disposal. The purpose of the Countywide Siting Element is to provide a planning mechanism to address the solid waste disposal capacity needed by the 88 cities in Los Angeles County and the unincorporated communities for each year of the 15-year planning period through a combination of existing facilities, expansion of existing facilities, planned facilities, and other strategies.

In 2012, residents and businesses in the County disposed of 8.72 million tons of solid waste at Class III landfills and transformation facilities located in and out of the County (see Tables 3.6-4 and 3.6-5). In addition, the amount of inert waste disposed at permitted inert waste landfills totaled 89,142 tons (County of Los Angeles, 2013).

TABLE 3.6-4

Annual Disposal Tonnage for 2012 (County of Los Angeles)

Facility Type	Volume	Units
In-County Class III Landfills	6,304,060	tons per year
Transformation Facilities	569,539	tons per year
Exports to Out-of-County Landfills	1,844,175	tons per year
Subtotal MSW Disposed	**8,717,773**	tons per year
Permitted Inert Waste Landfills	89,142	tons per year
Grand Total Disposed	**8,806,915**	tons per year

Source: County of Los Angeles, 2013
MSW = Municipal Solid Waste

TABLE 3.6-5

Average Daily Disposal Rate for 2012 (Based on 6 Operating Days)
(County of Los Angeles)

Facility Type	Volume	Units
In-County Class III Landfills	20,205	tons per day
Transformation Facilities	1,825	tons per day
Exports to Out-of-County Landfills	5,911	tons per day
Subtotal MSW Disposed	**27,942**	tons per day
Permitted Inert Waste Landfills	286	tons per day
Grand Total Disposed	**28,227**	tons per day

Source: County of Los Angeles, 2013
MSW = Municipal Solid Waste

Presently, two transformation facilities operate in the County with a combined average daily tonnage of 1,825 tons per day in 2012, or about 569,539 tons per year. It is expected that these two facilities will continue to operate at their current permitted daily capacity during the planning period of 2012 through 2027. The owners and operators of these facilities indicate that there are no plans to increase the permitted daily capacity (County of Los Angeles, 2013).

Los Angeles County Department of Public Works conducted a survey requesting landfill operators in the County to provide updates to their estimated remaining disposal capacity. Based on the results of the survey and considering permit restrictions, the total remaining permitted Class III landfill capacity in the County is estimated at 129.2 million tons as of December 31, 2012 (see Table 3.6-6) (County of Los Angeles, 2013).

TABLE 3.6-6

Los Angeles County Landfill Status

Solid Waste Facilities	Total YR 2012 (million tons)	2012 Average Tons per Day	Remaining Permitted Capacity (million tons)	Estimated Year of Closure[a]
Landfills:				
Antelope Valley	0.256	822	16.91	2042
Burbank	0.033	107	2.95	2053
Calabasas	0.197	633	5.51	2028
Chiquita Canyon	0.927	2,971	3.97	2016
Lancaster	0.213	682	12.27	2025
Pebbly Beach (Avalon)	0.003	9	0.09	2028
Puente Hills	2.168	6,950	6.10	2015
San Clemente	0.000	1	0.04	2032
Scholl Canyon	0.211	675	3.41	2028
Sunshine Canyon	2.217	7,107	74.37	2032
Whittier (Savage Canyon)	0.078	250	3.56	2025
Total	**6.304**	**20,205**	**129.19**	
Transformation Facilities:				
Commerce Refuse-to-Energy Facility	0.102	326	466.64[b]	--
Southeast Resource Recovery Facility	0.468	1,499	1,601.96[c]	--
Total	**0.57**	**1,825**	**2,068.60[d]**	
Inert Waste Facilities:				
Azusa[e]	0.089	286	64.13	**--**

Source: County of Los Angeles, 2013

(a) Remaining Life is based on either the 2012 average daily disposal tonnage or the facility's permit expiration date.

(b) Based on the Solid Waste Facility Permit limit of 2,800 tons per week, expressed as a daily average, six days per week.

(c) Based on U.S. EPA limit of 500,000 tons per year, expressed as a daily average, six days per week.

(d) Tonnage expressed as a daily average, six days per week.

(e) Currently only accepting inert waste.

In addition, there are 44 permitted large volume transfer/processing and direct transfer facilities, which are permitted to receive 100 tons of waste or more per operating day, and numerous facilities of smaller volume operating in the County. As local waste disposal capacity options diminish in the county, transfer and processing facilities operators are expected to ship waste to out-of-County landfills via truck or rail transport.

Because of community resistance to the extension of operating permits for existing facilities and to the opening of new landfills in the county, and the dwindling capacity of those landfills with operating permit time left, the exact date on which landfill capacity within the county will be exceeded is uncertain. Landfill remaining life based on Solid Waste Facility Permits in the county ranges from one year at one facility, to as many as 41 years at another (County of Los Angeles, 2013).

The LACDPW has reviewed the County's ability to meet daily disposal demands under different scenarios (e.g., landfill expansions, alternative technologies, waste-by-rail systems, and reduction/recycling). Under some of the scenarios, the County will have a difficult time meeting future disposal demands. In order to ensure disposal capacity to meet the county needs, jurisdictions in Los Angeles County must continue to pursue all of the following strategies: (1) expand existing landfills; (2) study, promote, and develop conversion technologies; (3) expand transfer and processing infrastructure; (4) develop a waste-by-rail system; and (5) maximize waste reduction and recycling.

3.6.1.2 Tesoro Los Angeles Refinery

The average amount of solid waste generated by the Tesoro Carson and Wilmington Operations during 2012/2013 is provided in Table 3.6-7. As noted in the table, an average of 14,874 tons per year of solid waste was generated by the Tesoro Refinery in 2012/2013.

TABLE 3.6-7

Solid Waste Generated by the Tesoro Los Angeles Refinery
2012-2013 (tons/year)

Location	2012 (tons/year)	2013 (tons/year)	2012/2013 Average (tons/year)
Carson Operations	10,536	7,599	9,068
Wilmington Operations	10,791	820	5,806
TOTAL	**21,327**	**8,419**	**14,874**

3.6.2 HAZARDOUS WASTE MANAGEMENT

Hazardous material, as defined in 40 CFR 261.20 and 22 CCR Article 9, is disposed of in Class I landfills. California has enacted strict legislation for regulating Class I landfills. The California Health and Safety Code requires Class I landfills to be equipped with liners, a leachate collection and removal system, and a ground water monitoring system.

Hazardous waste generated at area facilities, which is not reused on-site, or recycled off-site, is disposed of at a licensed in-state hazardous waste disposal facility. Two such facilities within California are the CWM Kettleman Hills facility in King's County, and the Clean Harbors Environmental Services facility in Buttonwillow (Kern County).

The Kettleman Hills landfill is a hazardous waste and municipal solid waste disposal facility operated by Waste Management Inc., near Kettleman City, in Kings County, California. The Kettleman Hills landfill was allowed to accept about 10.7 million cubic yards of hazardous waste under its RCRA permits. Kettleman Hills was operating close to capacity for the last few years and was accepting limited amounts of hazardous waste. CWM applied to DTSC for a modification to its RCRA permit at Kettleman Hills to allow for the expansion of its hazardous waste landfill, Unit B-18, by 14 acres and about five million cubic yards. CWM has also applied to U.S. EPA to both renew and modify its existing permits to allow for the expansion of the landfill. On May 21, 2014 DTSC finalized the permit modification which allowed the facility to increase its capacity by about five million cubic yards (DTSC, 2014). On October 13, 2014, DTSC rejected an appeal opposed to the hazardous waste landfill expansion at Kettleman Hills (Fresno Bee, 2014).

Buttonwillow is a 320-acre landfill operated by Clean Harbors Environmental Services Environmental Services and can accept in excess of 200 loads of waste per day. Typical waste streams include contaminated soils, hazardous waste for treatment of metals, plating waste, and hazardous and non-hazardous liquids (Clean Harbors, 2014). Buttonwillow has an approximate remaining capacity of approximately 8,890,000 cubic yards. The expected life of the Buttonwillow Landfill is approximately 40 years (Personal Communication, Marianna Buoni, Clean Harbors Buttonwillow, Inc., August, 2012).

Hazardous waste also can be transported to permitted facilities outside of California. The nearest out-of-state landfills are U.S. Ecology, Inc., located in Beatty, Nevada; Laidlaw Environmental Services located in Lake Point, Utah; Envirosafe Services, in Grandview, Idaho; Chemical Waste Management Inc. in Carlyss, Louisiana, and Waste Control Specialists in Andrews, Texas. Incineration is provided at Laidlaw Environmental Services, Inc., located in Deer Park, Texas.

In 2013, over two million tons of hazardous waste were generated in Los Angeles County, and over four million tons of hazardous waste were generated in the State of California (see Table 3.6-8, top twenty waste streams by volume listed). The most common types of hazardous waste generated in the district include contaminated soils, waste oil, inorganic solid waste, organic solids, aqueous solutions with organic residues, and asbestos-containing wastes. Because of the population and economic base in southern California, approximately half of the hazardous waste in the State of California is generated within Los Angeles County. Not all wastes are disposed of in a hazardous waste facility or incinerator. Many of the wastes generated, including waste oil, are recycled.

TABLE 3.6-8

Hazardous Waste Generation 2013
(tons per year)

Waste Name	Los Angeles County	Statewide Total
Contaminated Soils	1,401,202	2,016,358
Waste and Mixed Oil	237,835	511,533
Inorganic Solids	173,779	376,238
Blank/Unknown	6,301	264,642
Fly, Bottom, & Retort Ash	-- [(a)]	250,106
Oil/Water Separation Sludge	8,706	149,094
Organic Solids	78,875	136,292
Unspecified Oil-Containing Waste	29,140	115,504
Asbestos-Containing Waste	35,314	97,503
Aqueous Solution w/Organic Residues	36,554	92,569
Baghouse Waste	35,233	50,815
Unspecified Solvent Mixture	19,631	50,388
Polychlorinated Biphenyls	18,036	38,243
Unspecified Aqueous Solution	15,664	34,784
Unspecified Organic Liquid Mixture	17,404	23,640
Aqueous Solution with Metals	--[(a)]	20,556
Metal Sludge	5,097	18,725
Liquids w/ PH <= 2 with Metals	7,590	17,354
Unspecified Sludge Waste	--[(a)]	17,200
Totals	**2,126,361**	**4,281,544**

Source: DTSC, 2013
(a) (--) Not on list of top twenty waste stream totals generated in the County.

3.6.2.1 Tesoro Los Angeles Refinery

The amount of hazardous waste generated by the Tesoro Carson and Wilmington Operations during 2012/2013 is provided in Table 3.6-9. An average of 1,656 tons per year of hazardous waste was generated by the Tesoro Refinery in 2012/2013.

TABLE 3.6-9

Hazardous Waste Generated by the Tesoro Los Angeles Refinery
2012-2013 (tons/year)

Location	2012 (tons/year)	2013 (tons/year)	2012/2013 Average (tons/year)
Carson Operations	3,233	992	2,113
Wilmington Operations	802	912	857
TOTAL	**2,337**	**973**	**1,656**

3.6.3 REGULATORY BACKGROUND

Solid waste generated at the proposed project site must comply with federal, state, and local regulations and codes pertaining to solid waste disposal. Codes include Chapter VI Article 6 Garbage, Refuse Collection of the City of Los Angeles Municipal Code, Part 13 Title 42-Public Health and Welfare of the California Health and Safety Code, and Chapter 39 U.S. Solid Waste Disposal Code. California Solid Waste Management Act (AB 939) mandates every city in the state to divert at least 50 percent of solid waste from landfill disposal through source reduction, recycling, and composting.

3.6.3.1 Federal

3.6.3.1.1 Code of Federal Regulations

40 CFR, Part 258 Subtitle D of the RCRA establishes minimum location standards for siting municipal solid waste landfills. Because California laws and regulations governing the approval of solid waste landfills meet the requirements of Subtitle D, the U.S. EPA delegated the enforcement responsibility to the State of California.

3.6.3.2 State

3.6.3.2.1 California Solid Waste Reuse and Recycling Access Act

The California Solid Waste Reuse and Recycling Access Act of 1991 required each jurisdiction to adopt an ordinance by September 1, 1994, requiring any "development project" for which an application for a building permit is submitted to provide an adequate storage area for collection and removal of recyclable materials. AB 1327 regulations govern the transfer, receipt, storage, and loading of recyclable materials within California.

3.6.3.2.2 AB 939: California Integrated Waste Management Act

AB 939 was designed to focus on source reduction, recycling and composting, and environmentally safe landfilling and transformation activities. This act, passed in 1989, required cities and counties to divert 25 percent of all solid waste from landfills and transformation facilities by 1995, and 50 percent by year 2000. In 2011, the California Integrated Waste Management Act was amended by AB 341 and established a goal to divert 75 percent of solid waste generated from disposal by 2020. Since 2007, the goal measurement has been based on per capita as an indicator in evaluating program implementation and local jurisdiction performance to allow focus on implementation rather than a disposal-based indicator to measure compliance. The state-wide disposal rate in 2012 and 2013 were 4.3 and 4.4 pounds per resident per day, respectively, which are the "diversion rate equivalent" of 66 and 65 percent, respectively (CalRecycle, 2015).

3.6.3.3 Local

3.6.3.3.1 City of Los Angeles Solid Waste Management Policy Plan

The City of Los Angeles Solid Waste Management Policy Plan is a long-term planning document adopted by the City Council in November 1994 containing goals, objectives, and policies for solid waste management for the City. It specifies City-wide diversion goals and disposal capacity needs. The mandate was enacted to encourage reduction, recycling, and reuse of solid waste generated in the city to preserve landfill capacity, conserve water, energy, and other natural resources, and to protect the city's environment (City of Los Angeles 2006).

3.6.3.3.2 Solid Waste Integrated Resources Plan

The City of Los Angeles is developing the Solid Waste Integrated Resources Plan (SWIRP), which will serve as the 20-year master plan for City solid waste and recycling programs (City of Los Angeles, 2013). The SWIRP will outline City objectives to provide sustainability, resource conservation, source reduction, recycling, renewable energy, maximum material recovery, and public health and environmental protection for solid waste management planning through 2025—leading Los Angeles toward being a "zero waste" city. Achieving zero waste will require radical changes in three areas: product creation (manufacturing and packaging), product use (use of sustainable and recyclable products), and product disposal (resource recovery or landfilling). Stakeholders will be instrumental in guiding this visionary 20-year solid waste management plan. This plan will seek input from stakeholders representing a broad section of the community, from diverse cultural backgrounds and income levels, and will result in the development and implementation of a 20-year master plan for the City's solid waste and recycling programs.

3.6.3.3.3 Industrial Waste Control Ordinance

The Industrial Waste Management Division of the Bureau of Sanitation was established to protect the local receiving waters by regulating industrial wastewater discharge to the City's sewer system and by administering and enforcing the Industrial Waste Control Ordinance (Los Angeles Municipal Code Section 64.30) as well as U.S. EPA pretreatment regulations.

Operators of industrial facilities and certain commercial facilities that plan to discharge industrial wastewater to the City's sewage collection and treatment system are required to first obtain an industrial wastewater permit. Permits are issued when a determination has been made by the Board of Public Works for the City of Los Angeles that the wastewater to be discharged will not violate any provisions of the ordinance, the Board's Rules and Regulations, the water quality objectives for receiving waters established by the California Water Quality Control Board, Los Angeles Region, or applicable federal or state statutes, rules, or regulations.

3.6.3.3.4 City of Carson Sewage and Industrial Waste Ordinance

The City of Carson adopted by reference the Title 20, Utilities, Division 2, Sanitary Sewers and Industrial Waste, of the Los Angeles County Code as amended and in effect on January 2, 1990, with three amendments as the Sewage and Industrial Ordinance (Carson Municipal Code Sections 8500 - 8505).

The Industrial Waste Unit of Los Angeles County Public Works regulates industrial waste discharges into over 3,000 miles of local sewers within the unincorporated areas (PDF, 32 KB) of Los Angeles County and 37 contract cities including the City of Carson. The Industrial Waste Unit also regulates industrial wastewater that is collected, hauled, disposed, or discharged into the ground (where permissible).

Any business which generates, handles, or disposes of industrial wastewater must obtain an industrial waste disposal permit (Los Angeles County Code, Chapter 20.36) from the Industrial Waste Unit. The Industrial Waste Unit reviews plans to determine if facilities have adequate pretreatment systems. The business must obtain clearance and an Industrial Waste Disposal Permit (IWDP) for the discharge of wastewater to sanitary sewers, private disposal systems, or offsite disposal. They must comply with applicable Federal, State, local domestic and industrial waste regulations to be verified by the Industrial Waste Unit. The Industrial Waste Unit's goal is to ensure that facilities are designed so as to not create a nuisance, menace the public peace, health or safety, or impact the public sewer system, soil, underground or surface waters.

3.7 TRANSPORTATION AND TRAFFIC

3.7.1 REGIONAL CIRCULATION

The Tesoro Los Angeles Refinery, which includes both the Carson Operations and the Wilmington Operations, has its main administrative offices located at 2350 E. 223rd Street in the City of Carson. Four major freeways bound the proposed project facility. Regional access to the Refinery is provided by the Long Beach Freeway (Interstate 710), the Harbor Freeway (Interstate 110), and the San Diego Freeway (Interstate 405). Interstate 710 and Interstate 110 are major north and south highways, which extend from the Ports of Los Angeles and Long Beach through Los Angeles County. Interstate 405, less than one-quarter of a mile north of the proposed project site, runs diagonally through the region. The Gardena Freeway (State Route 91) lies further to the north of the site and runs east to west, while the Terminal Island Freeway (State Route 103) runs from East Sepulveda Boulevard and the Ports of Los Angeles and Long Beach. Additionally, the Alameda Corridor (Route 47), transverses the Refinery from northeast to southwest. Alameda Street has been, and continues to be upgraded, expanded and modified to provide a dedicated roadway system for trucks and railcars leaving the Ports of Los Angeles and Long Beach to provide more efficient movements of goods and materials into and out of the port areas. Sepulveda Boulevard, Wilmington Avenue, 223rd Street, Alameda Street, and Pacific Coast Highway are key arterials servicing the area.

In addition to the freeway and roadway systems, railroad facilities service the Refinery providing an alternative mode of transportation for the distribution of goods and materials. The area is served by the Union Pacific, BNSF, and the Pacific Harbor Line railroads, with several main lines occurring near the Refinery. The Refinery is located near the Ports of Long Beach and Los Angeles, which provide a mode for transportation of goods and materials via marine vessels.

3.7.2 LOCAL CIRCULATION

The Carson Operations are just south of Interstate 405, approximately one mile west of Interstate 710 and approximately two and one-half miles east of Interstate 110. The Refinery occupies an irregularly shaped parcel of land between 223rd Street on the north, Wilmington Avenue on the west, Sepulveda Boulevard on the south, and Alameda Street on the east (see Figure 2.3-1). Access to the Carson Operations is generally from Wilmington Avenue and Sepulveda Boulevard.

The Wilmington Operations are bounded to the north by Sepulveda Boulevard, to the west by Alameda Street, to the south by railroad tracks, and to the east by the Dominguez Channel and the State Route 103. The Wilmington Operations are bisected by Pacific Coast Highway, with the larger portion of the Wilmington Operations to the north of Pacific Coast Highway and the smaller portion to the south (see Figure 2.3-1). Access to the Wilmington Operations is generally from Pacific Coast Highway and Sepulveda Boulevard.

The proposed project area includes two north-south highways that extend from the port area to downtown Los Angeles: Interstate 710 on the east side of the Refinery and Interstate 110 on the west side of the Refinery. Each freeway has six lanes in the vicinity of the harbor, which widen to eight lanes to the north. Interstate 405 is an eight-lane freeway that passes through the Los Angeles region generally parallel to the coastline (southeast to northwest) immediately north of the Carson Operations. State Route 103 is a short highway that extends from Terminal Island across the Heim Bridge and terminates at Willow Street approximately 2,000 feet east of the northern boundary of the Wilmington Operations. It is six lanes wide on the southern segment, narrowing to four lanes at Anaheim Street.

Wilmington Avenue: Wilmington Avenue is a north/south four-lane divided street that extends from Lomita Boulevard to north of State Route 91. Wilmington Avenue provides access to the project site as well as regional access through its connection to Interstate 405. On-street parking is prohibited along Wilmington Avenue in the study area.

223rd Street: 223rd Street is a four- to six-lane street that is oriented in an east/west direction parallel to Interstate 405 in the study area. 223rd Street is grade separated from Alameda Street, with access between the two roadways provided by a ramp with signalized intersections at both ends. 223rd Street provides access to the Carson Operations and the Tesoro headquarters office building. On-street parking is allowed on 223rd in some sections of the study area. East of the project site, 223rd Street transitions to Wardlow Road.

Sepulveda Boulevard: Sepulveda Boulevard is an east-west street with two lanes in each direction that passes through the City of Carson and then becomes Willow Street in the City of Long Beach. Sepulveda Boulevard-Willow Street provides direct access to both the Wilmington and Carson Operations.

Alameda Street: Alameda Street is oriented in a north-south direction and consists of two lanes in each direction. Alameda Street extends north from Harry Bridges Boulevard and serves as a key truck route between the harbor area and downtown Los Angeles. The roadway is striped as a four lane roadway; however, its striping widens it to a six-lane facility in the vicinity of its intersections with the Pacific Coast Highway ramp and the Sepulveda Boulevard ramp. There are grade separations at all major intersections south of State Route 91. The roadway was improved as part of the Alameda Corridor Transportation Corridor project and runs adjacent to both the Carson and Wilmington Operations.

Pacific Coast Highway: Pacific Coast Highway is a four-lane east-west arterial highway that expands to six lanes between State Route 103-Alameda Street and the Dominguez Channel. Pacific Coast Highway bisects the Wilmington Operations and has interchanges with Interstate 710, State Routes 47 and 103, and connects to Alameda Street via a connector roadway (East "O" Street). Pacific Coast Highway provides access to the Wilmington Operations.

The intersections within the vicinity of the Carson and Wilmington Operations that may be adversely affected by the proposed project study are shown in Figure 3.7-1.

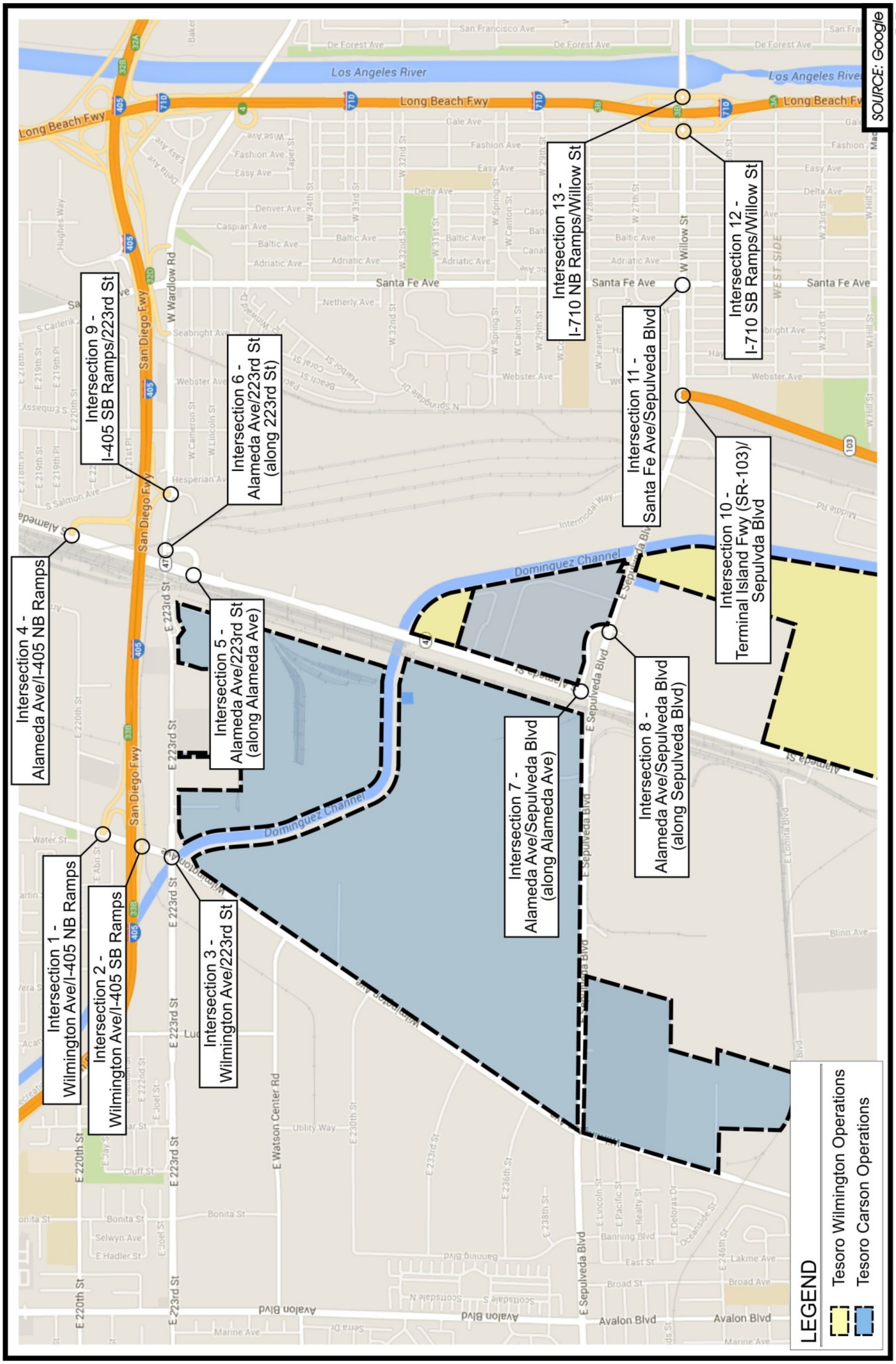

FIGURE 3.7-1
TRAFFIC INTERSECTION MAP
TESORO LOS ANGELES REFINERY

Project No. 2844
N:\2844\Traffic Intersection Map (rev.2).cdr

3.7.3 EXISTING TRAFFIC CONDITIONS

Existing truck and automobile traffic along study roadways and intersections was determined by taking vehicle turning movement counts (see Appendix E for the full traffic report) in August 2014. The traffic counts in August 2014 are expected to be representative of the baseline traffic conditions in the 2012-2013 timeframe because no major changes in traffic conditions occurred during that timeframe and the intersection of Wilmington Ave./Interstate 405 has been under construction since that time and will continue to be under construction during the initial construction phase of the propose project. The peak hour is determined by assessing the highest volume of total traffic occurring during one consecutive hour at each location. Regional traffic occurring during the morning and evening peak hours is mainly due to commute trips, school trips and other background trips.

3.7.3.1 Intersection Level of Service Criteria

The operating characteristics of an intersection are defined in terms of the LOS, as represented by intersection volume to capacity (V/C) ratio. LOS describes the quality of traffic flow based on variations in traffic volume and other variables such as the number of signal phases. For signalized intersections, it is measured from LOS A (excellent conditions) to LOS F (very poor conditions). Intersections that operate at LOS A to C operate well. Level C normally is taken as the design level in urban areas outside a regional core. Level D typically is the level for which a metropolitan area street system is designed. Level E represents volumes at or near the capacity of the highway which will result in possible stoppages of momentary duration and fairly unstable traffic flow. Level F occurs when a facility is overloaded and is characterized by stop-and-go (forced flow) traffic with stoppages of long duration. The relationship between V/C ratio and LOS for signalized intersection is shown in Table 3.7-1.

3.7.3.2 Intersection Level of Service Methodology

The study intersections potentially affected by the proposed project are located in the City of Los Angeles, the City of Long Beach, and the City of Carson. Although the three cities have approved different methods to assess operating conditions in intersections, the methodologies are similar and usually yield the same results and conclusions.

Most of the intersections are located in the City of Carson. LOS analysis for the City of Carson intersections was conducted using the Intersection Capacity Utilization (ICU) methodology. ICU methodology defines the LOS by the V/C ratio for the turning movements and intersection characteristics at the signalized intersections. The ICU value is determined by summing the V/C ratio of the critical movements, plus a factor for a yellow signal time. Traffic intersections within the Cities of Carson and Long Beach use the same ICU methodology, which was used to analyze intersections in the Cities of Carson and Long Beach.

TABLE 3.7-1

Level of Service Definitions

Level of Service	Description	Signalized Intersection Volume-to-Capacity Ratio (V/C)	Signalized Intersection Delay (seconds)
A	Free flowing, virtually no delay. Minimal Traffic.	$\leq$ 0.600	$\leq$ 10
B	Free flow and choice of lanes. Delays are minimal. All cars clear intersection easily.	>0.600 to 0.699	>10 and $\leq$ 20
C	Good operation. Delays starting to become a factor but still within acceptable limits.	>0.700 to 0.799	>20 and $\leq$ 35
D	Approaching unstable flow. Queues at intersection are quite long but most cars clear intersection on their green signal. Occasionally, several vehicles must wait for a second green signal. Congestion is moderate.	>0.800 to 0.899	>35 and $\leq$ 55
E	Severe Congestion and delay. Most of the available capacity is used. Many cars must wait through a complete signal cycle to clear the intersection.	>0.900 to 0.999	>55 and $\leq$ 80
F	Excessive delay and congestion. Most cars must wait through more than one on one signal cycle. Queues are very long and drivers are obviously irritated.	> 1.000	> 80

Intersections located in the City of Los Angeles are analyzed using ICU as well as the Circular 212 methodology, which provides a methodology to calculate the delay of critical movements in the intersection. The Caltrans ramp intersections are under Caltrans' jurisdiction and are required to be analyzed using the Highway Capacity Manual (HCM) methodology. HCM methodology defines the LOS by the average vehicle delay experienced by all vehicles traveling through the intersection. Table 3.7-1 presents the both V/C ratio and average delay associated with each LOS grade as well as a qualitative description of intersection operations at that grade.

3.7.3.3 Existing Intersection Operating Conditions

Peak hour LOS analyses were developed for 13 intersections in the vicinity of the Refinery (see Table 3.7-2). The LOS analysis indicates typical urban traffic conditions in the area surrounding the Refinery, with all intersections operating at Levels A to D during morning and evening peak hours. One intersection currently operates at LOS D (without the proposed project), Wilmington Avenue/Interstate 405 southbound ramps during the morning peak hour. All other intersections operate at LOS A to C during both morning and evening peak hours.

TABLE 3.7-2

Existing Intersection Peak Hour LOS

Intersection		Agency / LOS Methodology	AM Peak Hour			PM Peak Hour		
			V/C Ratio	Delay (sec)	LOS	V/C Ratio	Delay (sec)	LOS
1	Wilmington Ave/Interstate 405 NB Ramps	Caltrans / HCM	0.499	21.4	C	0.395	18.5	B
2	Wilmington Ave/Interstate 405 SB Ramps	Caltrans / HCM	0.355	44.2	D	0.629	15.7	B
3	Wilmington Ave/223rd St	Carson / ICU	0.643	-	B	0.690	-	B
4	Alameda Street/Interstate 405 NB Ramps	Caltrans / HCM	0.690	21.2	C	0.665	23.2	C
5	Alameda Street/223rd St (along Alameda Ave)	Carson / ICU	0.460	-	A	0.570	-	A
6	Alameda Street/223rd St (along 223rd St)[(a)]	LA / ICU	0.349	-	A	0.634	-	B
7	Alameda Street/Sepulveda Blvd (along Alameda Ave)	Carson / ICU	0.374	-	A	0.537	-	A
8	Alameda Street/Sepulveda Blvd (along Sepulveda Blvd)	Carson / ICU	0.415	-	A	0.742	-	C
9	Interstate 405 SB Ramps/223rd St	Caltrans / HCM	0.472	23.4	C	0.327	24.3	C
10	Terminal Island Fwy (SR-103)/Sepulveda Blvd	Long Beach / ICU	0.390	-	A	0.579	-	A
11	Santa Fe Ave/Sepulveda Blvd	Long Beach / ICU	0.624	-	B	0.781	-	C
12	Interstate 710 SB Ramps/Willow St	Uncontrolled Intersection						
13	Interstate 710 NB Ramps/Willow St	Uncontrolled Intersection						

Source: Appendix E, Tesoro Los Angeles Refinery Integration and Compliance Project, Traffic Impact Analysis.
Notes: V/C = Volume to Capacity Ratio, LOS = Level of Service, Delay = Average Vehicle Delay (Seconds)
(a) This intersection was analyzed using the ICU and Circular 212 methodologies (see Appendix E for Circular 212 results).

3.7.3.4 Baseline Transit Service

Public transportation in the City of Carson is provided primarily by the Carson Circuit, Torrance Transit and the Los Angeles County Metropolitan Transportation Authority (MTA) bus lines. The area near the Refinery is served by Carson Circuit (Route F – Business Center South) which serves the south central Carson area. Primary routes served by Route F include Bonita Street between 213th Street and Watson Center Road, 213th Street between Avalon Boulevard and Martin Street, and Wilmington Avenue between Watson Center Road and 223rd Street (City of Carson, 2004). Descriptions of the transit services are provided in the following paragraphs:

Metro Line 202 – This line operates between Wilmington and Watts. Within the study area, this line travels north and south along Alameda Street. Service is provided at 60 minute headways during weekday peak periods, late night, and owl service. Weekend and holiday service is not provided.

Long Beach Line 191/192 – These lines operate between Downtown Long Beach and Lakewood. Within the study area, the lines travel north and south along Santa Fe Avenue. Service is provided on weekdays, weekends, and holidays. These lines currently provide 20 minute headways during peak periods.

Long Beach Line 101/102/103/104 – These lines operate between Wilmington and Long Beach. Within the study area, the lines travel east and west along Sepulveda Boulevard beginning at Santa Fe Avenue. Service is provided at 20 minute headways during weekday peak periods. Weekend and holiday service is limited.

3.7.3.5 Bicycles and Pedestrians

The proposed project area is not considered to have high bicycle or pedestrian utilization due to its industrial nature and the lack of existing bike lanes on the designated truck routes. Residential and school facilities within walking or bicycling proximity to the project site are located to the east, on the east side of the State Route 103 and are, therefore, not expected to generate pedestrian and bicycle traffic near the Refinery since heavy industrial areas to the west of these residential and school areas do not provide likely destinations. Pedestrians are allowed to use the sidewalks and to cross intersections in the proposed project area. The streets and intersections are designed by the cities of Carson, Los Angeles and Long Beach to accommodate pedestrians. All pedestrian crossing areas are marked with crosswalks. There is one route with bicycle facilities present on Pacific Coast Highway in the City of Long Beach (east of 'E' Road ramps), which is designated as a Class III Bikeway (Bike Route) facility. A Class III Bikeway provides for shared use with pedestrian or motor vehicle traffic.

3.7.3.6 Baseline Rail Setting

The southern California area near the Refinery is served by two Class I railroads: Union Pacific railroad (UPRR) and the BNSF Railway (BNSF). In addition, Pacific Harbor Line, Inc. (PHL), a short line, provides rail transportation, maintenance, and dispatching services within the harbor area.

The Alameda Corridor, which was completed in 2002, serves the vicinity of the Tesoro Los Angeles Refinery. All trains of the UPRR and the BNSF use the Alameda Corridor to access the railroads' mainlines, which begin near downtown Los Angeles. East of downtown Los Angeles, trains use the BNSF San Bernardino Subdivision, the UPRR Los Angeles Subdivision, or the UPRR Alhambra Subdivision.

To transition from the Alameda Corridor to the Alhambra Subdivision, the UPRR utilizes trackage rights over Metrolink's East Bank Line, which runs parallel to the Los Angeles River on the east side of downtown Los Angeles. The UPRR Los Angeles Subdivision terminates at West Riverside Junction where it joins the BNSF San Bernardino Subdivision. The BNSF San

Bernardino Subdivision continues north of Colton Crossing and transitions to the BNSF Cajon Subdivision. The Cajon line continues north to Barstow and Daggett, and then east toward Needles, California and beyond. UPRR trains exercise trackage rights over the BNSF San Bernardino Subdivision from West Riverside Junction to San Bernardino and over the Cajon Subdivision from San Bernardino to Daggett, which is a short distance east of Barstow. The UPRR Alhambra Subdivision and the BNSF San Bernardino Subdivision cross at Colton Crossing in San Bernardino County. East of Colton Crossing, the UPRR Yuma Subdivision passes through the Palm Springs area, Indio, and to Arizona and beyond.

Currently, up to seven railcars per day of LPG are received at the Carson Operations LPG unloading rack. LPG can come from Tesoro Martinez, Central California, Lynndyl Utah, Bumstead Arizona, or Hutchinson or Conway Kansas.

3.7.4 REGULATORY BACKGROUND

Because the roadways cross separate city and county jurisdictions, maintenance is undertaken by the appropriate city or county departments, and state roadways are maintained by the Caltrans. In the proposed project area, Caltrans has the primary responsibility for Interstates 405, 110, 710, and the State Route 103; the Cities of Los Angeles and Carson have the primary responsibilities for the various roadways that comprise the local roadway network.

3.7.4.1 Federal

There are no federal traffic-related regulatory programs applicable to the proposed project modifications.

3.7.4.2 Congestion Management Program (State and Local Requirements)

In June 1990, California voters approved Proposition 111 to fund transportation-related improvements statewide. A Congestion Management Program (CMP) is required to be adopted for urbanized counties in California to be eligible for revenues associated with Proposition 111. In the County of Los Angeles, the Los Angeles County MTA is the agency that prepares the CMP. The goal of the CMP is to promote a more coordinated approach to land use and transportation decisions by requiring traffic impact analyses for individual development projects of potential regional significance (add 50 or more trips during either the a.m. or p.m. peak hours to arterials within the CMP network). The intersection of Pacific Coast Highway and Alameda Street is the one arterial monitoring station located near the Tesoro Los Angeles Refinery. The CMP also requires traffic studies to analyze CMP network freeway monitoring locations where a project adds 150 or more trips during the morning (a.m.) or evening (p.m.) peak hours. State Route 91, the Interstate 110, Interstate 405 and the Interstate 710 are freeways that are designated for monitoring in the CMP. Compliance with the CMP provisions include land use coordination through traffic impact analyses; implementation of Transportation Demand Management (TDM) strategies; maintenance of transit service standards; monitoring of CMP highway system levels of service; and development of level of service deficiency plans where needed.

Transportation planning for Los Angeles County is the responsibility of the Southern California Association of Governments (SCAG). Under Federal law, SCAG must prepare a Regional Transportation Plan (RTP). The RTP demonstrates how the region will meet federal mandates associated with air quality requirements and must be approved in order to receive federal transportation funds. The MTA is the state designated planning agency for Los Angeles County and submits recommended roadway projects to SCAG for inclusion in the RTP. The MTA identifies the transportation needs and challenges that Los Angeles County will face over a 25-year period through the development of Long Range Transportation Plans (LRTP). The adopted LRTP becomes the blueprint for implementing future transportation improvements in Los Angeles County. The LRTP seeks to maintain the existing transportation system, maximize system efficiency, increase system capacity, and manage demand.

3.7.4.3 Local

3.7.4.3.1 County of Los Angeles

The Transportation Element of the Los Angeles County General Plan was adopted in November 1980. The three objectives of the Transportation Element are:

- To achieve a transportation system that is consistent with the comprehensive objectives of the General Plan and the needs of the residents.

- To achieve a transportation system that is responsive to economic, environmental, energy conservation, and social needs at the local community, area, and countywide levels.

- To achieve an efficient, balanced, integrated, multimodal transportation system that will satisfy short- and long-term travel needs for the movement of people and goods.

The only policy relevant to the proposed project modifications within the Transportation Element includes the following:

- Policy 31. Provide for the safe movement of hazardous materials.

3.7.4.3.2 City of Los Angeles

The City of Los Angeles Transportation Element of the General Plan was adopted in 1999. In 2015, the City adopted the Mobility Plan 2035, which is an update to the 1999 Transportation Element (City of Los Angeles, 2015). The purpose of the Mobility Plan Element is to present a guide to the further development of a citywide transportation system which provides for the efficient movement of people and goods. This Mobility Element recognizes that primary emphasis must be placed on maximizing the efficiency of existing and proposed transportation infrastructure through advanced transportation technology, through reduction of vehicle trips, and through focusing growth in proximity to public transit. The Mobility Element recognizes that locating land uses that better serve the needs of the population closer to where they work and lives reduces the number and distance of vehicle trips and decreases the amount of pollution from mobile sources. The Mobility Element provides numerous policies to enhance transportation systems in the City. For example, Policy 5.2 supports ways to reduce vehicle miles traveled (VMT) per capita. The Mobility Element identifies the major roadways and designated truck routes throughout the City. No policies are directly relevant to the proposed project modifications as the proposed project will not result in an increase in vehicle trips, once construction is completed.

3.4.4.3.3 City of Carson

The City of Carson Transportation and Infrastructure Element of the General Plan was adopted in 2004. The purpose of this Element is to document the methods and results of the analysis of the existing and projected future circulation conditions in the City of Carson. The Element identifies the major roadways and designated truck routes throughout the City. No policies are directly relevant to the proposed project modifications.

3.4.4.3.4 City of Long Beach

The City of Long Beach Mobility Element of the General Plan was adopted in 2013 to replace the Transportation Element adopted in 1991. The Mobility Element describes the general location and extent of existing and proposed major thoroughfares, transportation routes, terminals, ports, and other local public utilities and facilities. The Element strives to balance the use of the transportation network that meets the needs of all users of streets, roads, and highways, while providing safe and convenient travel options that are suitable for the urban and suburban context of the City's neighborhoods and districts. The Element identifies the major roadways and designated truck routes throughout the City. The Element contains policies and strategies to support goods movement. No policies or strategies are directly relevant to the proposed project modifications.

3.7.4.3.5 Intersection Operations

The study intersections in the vicinity of the proposed project are located in the City of Los Angeles, the City of Long Beach, and the City of Carson.

In the City of Los Angeles, LOS D is the minimum acceptable threshold; however, the City has a sliding scale of significance for service levels C, D, E and F-- a greater effect is allowed under LOS C than LOS D before being considered a significant impact. The City of Los Angeles significance scale is as follows:

- V/C ratio increase greater than or equal to 0.040 if final LOS is C,
- V/C ratio increase greater than or equal to 0.020 if final LOS is D, or
- V/C ratio increase greater than or equal to 0.010 if final LOS is E or F.

The cities of Long Beach and Carson consider LOS D to be the minimum acceptable level of service, and a significant impact is considered to be a project-related change in V/C ratio of 0.02 or greater.

3.7.4.4 Rail Operations

The California Public Utilities Commission (CPUC) has regulatory authority over rail operations and grade crossings throughout the state. No grade crossings would be added as part of the proposed project.

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CHAPTER 4

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

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4.0 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 INTRODUCTION

CEQA Guidelines §15126.2 and §15126.4 require an EIR to include a description of the significant environmental effects of a proposed project, significant environmental effects which cannot be avoided, significant irreversible environmental changes, growth-inducing impacts, and mitigation measures proposed to minimize the significant adverse impacts. This chapter assesses the potential environmental impacts of the construction and operation of the Tesoro Los Angeles Refinery Integration and Compliance Project described in Chapter 2.

Chapter 4 evaluates those impacts that were identified as potentially significant under the requirements of CEQA in the NOP/IS (see Appendix A). No comments were received on the NOP/IS that identified any new environmental topic areas that could be adversely affected by the proposed project. An impact is considered significant under CEQA if it leads to a "substantial, or potentially substantial, adverse change in the environment." Impacts from the proposed project are categorized in this analysis as one of the following:

Beneficial – Impacts will have a positive effect on the resource.

No impact – There would be no impact to the identified resource as a result of the proposed project.

Adverse but not significant – Some impacts may result from the project; however, they are judged to be insignificant. Impacts are frequently considered insignificant when the changes are minor relative to the size of the available resource base, would not change an existing resource, or would not exceed significance thresholds established by the lead agency.

Potentially significant but mitigation measures reduce to insignificance – Significant adverse impacts may occur; however, with proper mitigation, the impacts can be reduced to insignificance.

Potentially significant and mitigation measures are not available to reduce to insignificance – Adverse impacts may occur that would be significant even after mitigation measures have been applied to lessen their severity.

4.1.1 PROJECT DIRECT EFFECTS

The proposed project has the potential to generate significant adverse direct impacts to environmental resources. Impacts are considered to be direct if they produce direct physical changes or alterations to ecological systems (e.g., air quality, hazards and hazardous materials, hydrology and water quality, noise, solid and hazardous waste, and transportation and traffic).

The potential direct impacts from the proposed project components described in Section 2.7 of the project description are analyzed in this Chapter.

4.1.2 DOWNSTREAM EFFECTS

In addition to direct impacts, the proposed project may have indirect impacts on downstream equipment by causing increased utilization from operational changes, even though the equipment is not part of the proposed project, that is, it is not modified in any way, is operating within existing permit limits and no permit modification would be required. Due to the nature of Refinery operations, all equipment activity levels may continue to fluctuate on a monthly or even daily basis. While the proposed project does not affect the types of crude oils processed at the Refinery and, thus, will not have impacts due to changes in crudes, the proposed project may increase downstream unit processing rates on a monthly or daily basis. Such indirect impacts are expected to occur in the following units; Wilmington Operations units downstream of the Coker (from H-100 duty increase and potential crude capacity increase) and tanks; and, Carson Operations FCCU, Cogeneration (Cogen) Unit, and tanks. The anticipated indirect operational changes are described below and are included as part of the analysis of operational impacts, e.g., operational emission impacts are included in Subsection 4.2.2.2. All mobile source emission impacts from the proposed project have been accounted for as direct emissions impacts. After careful review of the proposed project, no other indirect air quality impacts were identified.

4.1.2.1 Indirect Impacts from Downstream DCU H-100 Duty Resulting from Increase/Potential Crude Capacity Increase (Wilmington Operations)

As summarized in Subsection 2.1.7.3, in order to ensure that all impacts of the modification to the Refinery are fully analyzed, the potential impacts from a previously submitted permit application to revise the permit description of Wilmington Operations DCU heater H-100 to conform to SCAQMD/Industry standards has been included in the proposed project. The description will be changed from the ‘design heat release’ basis (252 mmBtu/hr) to the industry standard ‘maximum heat release’ basis (302.4 mmBtu/hr). This revision of the permit description does not involve any physical modifications, but would increase use of the heater which will enable more efficient production of gas oil and distillates from the feed to the DCU. Although the described duty of the heater will increase to 302.4 mmBtu/hr, there will be no increase in peak daily emissions as permit conditions will be imposed to limit criteria pollutant emissions. Mass emissions of NOx, SOx, PM10, CO and VOC will be restricted in the revised permit.

This revision of the permit description would allow production of additional heat from H-100 which is expected to be used to produce more gas oil from residual oil in the DCU fractionator and vacuum towers and could also result in a small increase in crude oil throughput capacity of up to two percent (or up to 6,000 bbl/day). Alternatively, the additional heat from H-100 could be used to get more overhead production from the DCU fractionator and to enable more efficient recovery of distillate product, or to process a slightly heavier crude oil blend. Any crude oil blend processed would be within the existing crude oil operating envelope that is addressed in Section 2.9 and Appendix F, the McGovern Report. Processing a slightly heavier crude oil blend would only result in additional impacts from H-100 in the DCU and a slight increase in coke production and handling. However, the impacts from the increase in crude oil throughput of up to 6,000 bbl/day will result in greater environmental impacts downstream of the DCU due to increased emissions associated with increased firing of heaters in the downstream process units. In addition to a slight increase in coke production and handling, ~~Processing~~ increased processing of crude oil ~~throughput~~ in the H-100 heater will have downstream impacts associated with processing all the various hydrocarbon fractions in crude oil. The light ends will go overhead in the distillation column downstream of the H-100 heater and cascade through downstream process units (e.g., HTU-3, CRU-2, and the Sulfur Recovery Plant) as further described below and in Table 4.1-1. Comparatively, the ability to process heavier crude oil blends would only impact one unit, the DCU. No further impacts on the DCU are expected since Tesoro is not modifying downstream DCU equipment (i.e., coke drums) or operation (e.g., cycle time of the coke drums) (see Section 2.5.4.1). Thus, this scenario of an increase in crude oil throughput of up to 6,000 bbl/day is analyzed as a worst-case analysis. Therefore, the downstream impacts of increasing the duty of the H-100 heater, including the potential crude oil throughput capacity increase are included in the analysis of project operational impacts.

Tesoro used its proprietary Linear Program model of refinery processes (see Section 2.5.3) to predict the impacts of increasing Wilmington Operations crude and crude feedstocks capacity by 6,000 bbl/day. The Linear Program model was run to assess the configuration and constraints of the Refinery under currently operating conditions compared to operating conditions once the proposed project becomes operational. The results of the Linear Program model showed that many of the downstream units were at capacity under current conditions and there was little change in the utilities (e.g., water and electricity) used on the units that were at full rates. The units where the increased crude throughput had a downstream effect were the DCU fractionation tower, the DCU, HTU-3 (Distillate Hydrotreater) and the CRU-2 (#2 Reformer). There was also a minor increase in operation of the Sulfur Recovery Plant due to the increased crude oil throughput rate. With the key conversion units currently at capacity, the Linear Program model predicted less premium gasoline production from Wilmington Operations once the proposed project is implemented. This is because the increased throughput would not result in an increase in the production of octane that is required to make premium gasoline, but could result in an increase in crude oil throughput to produce regular gasoline. The Linear Program model was used to predict any increases in downstream unit heater firing rates along with unit rates and other process variables for those units that are not currently operating at capacity, as shown by the results of the Linear Program model. All of the indirect impacts from increased utilization are analyzed in this EIR.

The increases in fired duty identified by the Linear Program model are presented in Table 4.1-1. The increases identified in Table 4.1-1 were used to analyze potential operational air quality and water demand impacts (see Section 4.4), as these were the only environmental topic areas identified that could be adversely affected by changes in fired duty from the proposed project.

TABLE 4.1-1

Increased Utilization

Unit	Heater	Duty Increase (mmBtu/hr)
Wilmington DCU	H-101	7.0
Wilmington HTU-3	H-30	4.1
Wilmington HTU-3	H-21/22	4.1
Wilmington CRU-2	H-510	0.4
Wilmington CRU-2	H-501A/501B/502/503/504	1.6
Wilmington Boilers	Boilers 7/8/9/10	10.0
Sulfur Recovery Plant	H-1601/1602	0.125
Sulfur Recovery Plant	F-704 Incinerator	N/A; 3 LTPD of sulfur increased production
Sulfur Recovery Plant	F-754 Incinerator	N/A; 3 LTPD of sulfur increased production

N/A = not applicable; LTPD = Long tons per day (2,240 lb/day)

4.1.2.2 Increased Utilization of Carson Operations Cogeneration Facility

The proposed project is expected to result in an increase in steam demand primarily to process amylenes (C5 olefins) in the Carson Operations Alkylation Unit. Processing amylene in the Carson Alkyation Unit enables propylene and butylene feedstocks to be sent to the Wilmington Alkylation Unit, since the Wilmington Alkylation Unit loses a source of feedstock with the shutdown of the Wilmington FCCU. The increased separation of feedstock and associated increased steam demand is expected to occur at the Carson Operations and would result in an increase in utilization of the existing Watson Cogeneration Facility (Cogen) post-project compared to average utilization in 2012 and 2013. The proposed project will increase steam demand from 2012/2013 baseline levels by approximately 30,000 pounds per hour (lb/hr), which requires approximately 42 mmBtu/hr of increased duct burner firing. The steam demand of the proposed project does not require any physical modification to the Cogen or permit modification. However, the potential impacts from the incremental steam increase associated with the proposed project are evaluated in this chapter.

4.1.2.3 Increased Utilization of the Carson Operations FCCU

Modifications are proposed within both Carson and Wilmington Operations, which would allow the Carson Operations FCCU to receive additional gas oil feed from Wilmington Operations. The gas oil will be available due to the Wilmington Operations FCCU shutdown. Compared to the baseline, the peak day operations and operational emissions from the Carson Operations FCCU will not change. However, the average annual feed is projected to increase by approximately 365,000 bbl/year. Therefore, certain impacts, such as GHG emissions will increase when considered on an annual basis and are analyzed herein.

Once the proposed project becomes operational, the Carson Operations FCCU is expected to operate more consistently at its recent demonstrated capacity of 102,500 bbl/day. This is the unit’s baseline peak daily operating rate, which has been achieved frequently in the past. The design rate of 105,000 bbl/day has been achieved in the past, though less frequently. Two major factors that will support consistently operating the Carson Operations FCCU at its demonstrated capacity are: 1) consistently providing gas oil feed from Wilmington Operations and 2) recovering distillate from gas oil streams so that the Los Angeles Refinery balances the available gas oil with the production requirement for gas oil (i.e., to be in balance). The first factor will enable the Los Angeles Refinery to discontinue or reduce purchasing gas oil from external third-party sources in order to keep the FCCUs operating near capacity. The second factor is important so that there is not an excess of gas oil that cannot be processed into finished fuels.

4.1.2.4 Increased Utilization of Existing Tanks at Carson and Wilmington Operations

Tesoro evaluated existing and incremental increased tank usage from existing tanks at both Carson and Wilmington Operations with consideration given to commodities and throughputs that would be transferred and stored post-project and that would increase emissions. Increases in tank usage include: 1) transfers between Carson and Wilmington Operations that are not currently occurring, but that will be made when the Interconnecting Pipelines are complete; and, 2) additional product and intermediate feedstocks associated with increased unit rates that may result from increase in crude oil (i.e., 6,000 bbl/day) processed at the Wilmington Operations DCU. Increased tank usage was evaluated compared to permit limitations. If physical or permit modifications were required to existing tanks; the tank modifications were included as part of the proposed project (included in the direct impact analysis). Additionally, if the proposed project would increase usage of an existing tank compared to baseline operations, but a physical or permit modification is not required, the increased emissions are also evaluated in this chapter (included in the indirect impact analysis).

4.1.2.5 Other Projects

As noted in Section 2.1, the SCAQMD previously released a Notice of Intent to adopt a Draft Negative Declaration (ND) for the Tesoro Storage Tank Replacement and Modification project. One of the public comments made on the Storage Tank Replacement and Modification project ND was that it was part of a larger project to transport crude oil from the Bakken region by rail to a proposed Vancouver Energy Terminal in the state of Washington and then by marine vessel to the Los Angeles Refinery. The Vancouver Energy Terminal project is an independent project undergoing separate environmental review by the Energy Facility Site Evaluation Council (EFSEC) in the state of Washington, and has not been approved and there is no guarantee that the terminal will be approved or constructed. The Vancouver Energy Terminal is being proposed by Vancouver Energy, a joint venture between Tesoro Refining & Marketing Company LLC and Savage Companies. The Proposed Vancouver Energy Project would offer the transport of crude oils to any of the refineries located on the West Coast regardless of ownership, not just Tesoro refineries. The proposed Vancouver Energy Terminal project is unrelated to the replacement of crude oil tanks or the Tesoro Refinery Integration and Compliance project because it could go forward with or without the currently proposed project; that is, neither project relies on the other project to be implemented. Similarly, Bakken crude oil is currently transported by rail to refineries and unloading facilities on the East and West Coasts. Consequently, transport of Bakken crude oil would continue to occur with or without constructing the Vancouver Energy Terminal. Regardless of the source of crude oil acquired to be processed in the Refinery, the proposed replacement of the crude oil tanks will proceed independently. The Los Angeles Refinery has limited ability to process Bakken crude oil and other light sweet crude oils, and no modifications are being proposed in the Tesoro Refinery Integration and Compliance Project that would increase the ability of the Refinery to process Bakken crude oil. Please see Section 2.5.4.1 and the McGovern Report in Appendix F for further explanation of the limitations on the Refinery's ability to process lighter crude oils. Replacing the crude oil tanks will not change the origin of the crude oil because the Refinery is not making any equipment modifications that would allow it to receive crude oils that cannot be blended to the same API gravity and sulfur content parameters than it currently receives. Therefore, there are no direct or indirect impacts on refinery tanks, units, or operations due to operation of the proposed Vancouver Energy Terminal.

4.2 AIR QUALITY

The NOP/IS (see Appendix A) determined the air quality impacts of the proposed project at the Refinery are potentially significant. Project-specific and cumulative adverse air quality impacts associated with increased emissions of air contaminants (criteria air pollutants, GHGs, and TACs) during the construction and operation phases of the proposed project have been evaluated in this EIR. No comments were received on the air quality analysis presented in the NOP/IS that identified other areas of possible impact that would require additional analysis. Potential adverse health impacts to sensitive receptors have also been analyzed in the EIR. Potential construction and operational air quality impacts at the Refinery and the surrounding areas are provided in this section.

While the proposed project is expected to emit GHGs, emitting GHGs by a single project into the atmosphere would not by itself necessarily cause an adverse environmental effect. Rather, it is the increased accumulation of GHGs from more than one project and many other sources that may result in global climate change. The resultant consequences of that climate change can cause adverse environmental effects. In virtually every project subject to CEQA review, a project's GHG emissions will be relatively small, even infinitesimal, within the scope of global or even statewide GHG emissions, and, as such, will almost certainly have no significant direct impact on climate change. The proposed project is expected to reduce GHG emissions, which will aid the State in achieving AB32 goals. However, due to the complex physical, chemical, and atmospheric mechanisms involved in global climate change, it is likely impossible to identify the specific impact, if any, to global climate change from one project's incremental increase in global GHG emissions. As such, the project GHG emissions and the resulting significance of potential impacts are more properly assessed on a cumulative basis. Therefore, the environmental setting and the significance of potential impacts from the proposed project's GHG emissions is determined on a cumulative basis in Chapter 5 - Cumulative Impacts.

4.2.1 SIGNIFICANCE CRITERIA

A threshold of significance is an identifiable quantitative, qualitative, or performance level of a particular environmental effect. Proposed projects that do not exceed the significance threshold for the effect under evaluation normally will be determined to be less than significant. Exceeding the significance thresholds means the effect will normally be determined to be significant by the lead agency (CEQA Guidelines Section 15064(a)).

To determine whether or not air quality impacts from the proposed project are significant, impacts will be evaluated and compared to the significance criteria in Table 4.2-1. If impacts equal or exceed any of the criteria in Table 4.2-1, they will be considered significant.

TABLE 4.2-1

Air Quality Significance Thresholds

Mass Daily Thresholds[a]		
Pollutant	**Construction[b]**	**Operation[c]**
NO_x	100 lb/day	55 lb/day
VOC	75 lb/day	55 lb/day
PM10	150 lb/day	150 lb/day
PM2.5	55 lb/day	55 lb/day
SOx	150 lb/day	150 lb/day
CO	550 lb/day	550 lb/day
Lead	3 lb/day	3 lb/day
Toxic Air Contaminants, Odor, and GHG Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk $\geq$ 10 in 1 million Chronic and Acute Hazard Index $\geq$ 1.0 (project increment) Cancer Burden $\geq$ 0.5 excess cancer cases (in areas $\geq$ 1 in 1 million)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
GHG	10,000MT/yr CO_2eq for industrial facilities	
Ambient Air Quality for Criteria Pollutants[d]		
NO_2 1-hour average annual average	In attainment; significant if project causes or contributes to an exceedance of any standard: 0.18 ppm (state) and 0.100 (federal)[e] 0.03 ppm (state) and 0.0534 ppm (federal)	
PM10 24-hour annual average	 10.4 μg/m^3 (construction)[f] and 2.5 μg/m^3 (operation) 1.0 μg/m^3	
PM2.5 24-hour average	 10.4 μg/m^3 (construction)[f] and 2.5 μg/m^3 (operation)	
SO_2 1-hour average 24-hour average	 0.255 ppm (state) and 0.075 ppm (federal – 99th percentile) 0.04 ppm (state)	
Sulfate 24-hour average	 25 μg/m^3 (state)	
CO 1-hour average 8-hour average	In attainment; significant if project causes or contributes to an exceedance of any standard: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)	
Lead 30-day average Rolling 3-month average Quarterly average	 1.5 μg/m^3 (state) 0.15μg/m^3 (federal) 1.5μg/m^3 (federal)	

a) Source: SCAQMD CEQA Handbook (SCAQMD, 1993)
b) Construction thresholds apply to both the SCAB and Coachella Valley (Salton Sea and Mojave Desert Air Basin)
c) For Coachella Valley, the mass daily thresholds for operation are the same as the construction thresholds.
d) Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
e) The federal threshold has not been adopted for general use yet by SCAQMD, but as it is a federal requirement for permits being issued for this project.
f) Ambient air quality threshold based on SCAQMD Rule 403.

KEY: ppm = parts per million; μg/m^3 = microgram per cubic meter; lb/day = pounds per day; MT/yr CO2eq = metric tons per year of CO_2 equivalents, $\geq$ greater than or equal to, > = greater than

The SCAQMD makes significance determinations for construction impacts based on the maximum or peak daily emissions during the construction period, which provides a "worst-case" analysis of the construction emissions. Similarly, significance determinations for operational emissions are based on the maximum or peak daily emissions during the operational phase. For equipment subject to SCAQMD permit requirements, peak daily emissions are the maximum potential emissions allowed by permit conditions.

4.2.2 ENVIRONMENTAL IMPACTS

4.2.2.1 Construction Emission Impacts

4.2.2.1.1 Regional Impacts

Construction emissions are expected from the following equipment and processes:

- On-site construction equipment (loaders, backhoes, forklifts, etc.);
- On-site and off-site vehicle emissions, including delivery trucks and worker vehicles;
- On-site fugitive dust associated with site construction activities; and,
- On-site and off-site fugitive dust associated with travel on unpaved and paved roads.

Construction emissions were calculated for peak day construction activities in each month construction is expected to occur. Daily construction emissions were calculated for the peak construction day activities and are presented in Table 4.2-2. Peak day emissions are the sum of the highest potential daily emissions from all construction sources, which include employee vehicles, fugitive dust sources, construction equipment, and transport activities for the construction period. Total peak construction emissions for VOC occur in Month 25 when the new storage tanks are painted, while peak daily construction emissions for CO is expected to occur in Month 20 and NOx, SOx, PM10, and PM2.5 occur in Month 18. Detailed construction emissions calculations are provided in Appendix B-1.

Construction Equipment

On-site construction equipment would be a source of combustion emissions. Construction equipment may include backhoes, compressors, compactors, cranes, dozers, excavators, front-end loaders, generators, graders, pile drivers, roll-off trucks, tractors, trenchers, water trucks and welding machines. The equipment is assumed to be operational no more than ten hours per day during a normal construction day. Construction workers are expected to be at the site for longer than ten hours per day, including time for lunch and breaks, organization meetings, and so forth, however, construction equipment would not be expected to operate for more than ten hours. However, some project components (No. 51 Vacuum Unit, Alkylation Unit, Carson Steam Generation, and LHU at the Carson Operations and the HCU at the Wilmington Operations) will experience periods of 24-hour per day turnarounds, when equipment is assumed to be operational up to 20 hours per day. Each turnaround period is expected to be shorter than 30 days and most of the turnaround periods are not expected to overlap. To provide a conservative assumption, it is assumed that turnarounds would occur during peak construction. Construction emission calculations have accounted for project components with activities during turnaround periods. Emission factors for construction equipment were taken from the CARB OFFROAD Inventory Model (http://www.arb.ca.gov/msei/categories.htm) and the CEQA Air Quality Handbook Construction Equipment Emissions tables available on the SCAQMD webpage (http://aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/off-road-mobile-source-emission-factors), for emission categories not available in CARB's most recent OFFROAD inventory. Estimated emissions from construction equipment used for construction are included in Table 4.2-2 and Appendix B-1.

TABLE 4.2-2

Tesoro Refinery
Unmitigated Peak Construction Emissions[(a)]
(lb/day)

ACTIVITY	VOC	CO	NOx	SOx	PM10	PM2.5[(b)]
Construction Equipment	41.18	422.81	420.92	0.90	29.82	26.23
Vehicle Emissions	3.22	92.73	154.81	0.51	32.57	10.96
Fugitive Dust From Construction[(c)]	--	--	--	--	2.36	0.68
Fugitive Road Dust[(c)]	--	--	--	--	3.80	0.80
Architectural Coating	62.25	--	--	--	--	--
Total Emissions[(d)]	**106.65**	**515.54**	**575.73**	**1.41**	**68.55**	**38.67**
SCAQMD Threshold Level	75	550	100	150	150	55
Significant?	**Yes**	**No**	**Yes**	**No**	**No**	**No**

(a) Peak emissions for VOC predicted to occur in Month 25. Peak CO predicted to occur in Month 20. NOx, SOx, PM10, and PM2.5 predicted to occur during Month 18.
(b) PM2.5 is determined using the methodology in SCAQMD, 2006.
(c) Assumes application of water three times per day.
(d) The emissions in the table may differ slightly from those in Appendix B-1 due to rounding.

Vehicle Emissions

Vehicle emissions include construction worker vehicles, pick-up trucks, flatbed trucks, dump trucks, water trucks, semi tractors, concrete trucks, and delivery trucks. Primary emissions generated would include combustion emissions from engines during idling and while operating. Emissions are based on the estimated number of trips per day and the round trip travel distances.

Construction emissions include emissions from construction worker vehicles traveling to and from the work site. The peak manpower needed during the construction period is expected to vary up to a maximum of 696 workers in Month 20. However, the peak emission calculations were estimated to occur during Months 18 for NOx, SOx, PM10 , and PM2.5, 20 for CO, and 25 for VOC, when the numbers of workers are expected to be 661, 696, and 609, respectively (see Appendix B-1). Each worker commute vehicle is assumed to travel a one-way distance of 14.7 miles (CAPCOA, 2013) to and from work each day, making two one-way trips per day with the average vehicle ridership assumed to be 1.1, i.e., most workers drive alone. Emissions from employee vehicles are presented in Table 4.2-2 and Appendix B-1. Emissions from employee vehicles were calculated using the EMFAC2011 emission factors available on the CARB Emissions Inventory webpage (http://www.arb.ca.gov/msei/categories.htm).

All cars and pickup trucks used for short trips within and near the Refinery to travel between equipment storage and the Refinery units are assumed to travel five miles or less per trip.

Medium- and heavy-duty diesel trucks include dump trucks, water trucks, and delivery trucks. Heavy heavy-duty semi-trucks and concrete trucks were also included in the project construction analysis. Primary emissions generated would include exhaust emissions from diesel engines while operating. Emissions from trucks (both delivery and heavy-duty) are calculated using the EMFAC2011 on-road emission factors. Estimated emissions for all trucks are included in Vehicle Emissions in Table 4.2-2 and Appendix B-1.

Fugitive Dust Associated with Site Construction Activities

Fugitive dust sources include grading, trenching, wind erosion, and truck filling/dumping at the site to construct necessary foundations. During construction activities, water would be applied as a dust suppressant in the construction area during grading, trenching, and earth-moving activities to control or reduce fugitive dust emissions pursuant to SCAQMD Rule 403. Application of water reduces PM emissions by a factor of up to 61 percent (SCAQMD, 2007). Fugitive dust suppression, often using water, is a standard operating practice and is one method of complying with SCAQMD Rule 403. Estimated peak controlled PM10 and PM2.5 emissions during peak construction activities for fugitive dust sources are 2.36 pounds per day (lb/day) and 0.68 lb/day, respectively (see Table 4.2-2). The detailed emission calculations are provided in Appendix B-1.

Fugitive Dust Associated with Travel on Paved and Unpaved Roads

Vehicles and trucks traveling on paved and unpaved roads are also a source of fugitive emissions during the construction period. Fugitive dust emissions were also calculated for on-site cars, light-duty trucks, and buses. The fugitive emissions for trucks assume delivery trucks would travel on paved roads and water trucks and off-road construction equipment would travel on unpaved roads. Emissions of dust caused by travel on paved roads were calculated using the U.S. EPA's, AP-42, Section 13.2.1 emission factor for travel on paved roads. Emissions of dust caused by travel on unpaved roads were calculated using the U.S. EPA's, AP-42, Section 13.2.2 emission factor for travel on unpaved roads. CARB's Methodology 7.9 was used to determine the appropriate silt loading for calculating fugitive dust emissions. The estimated PM10 and PM2.5 emissions during peak construction activities (Month 18) from vehicles for fugitive dust on paved roads are 26.03 lb/day and 10.96 lb/day, respectively (see Table 4.2-2 and Appendix B-1). The estimated PM10 and PM2.5 emissions during peak construction activities (Month 18) from vehicles for fugitive dust on unpaved roads are 3.80 lb/day and 0.80 lb/day, respectively (see Table 4.2-2 and Appendix B-1).

Architectural Coatings

The proposed project would include applying some architectural coating to equipment as necessary. Refinery equipment is often painted with specific types of architectural coatings to provide protection from extreme environmental conditions. Most of the parts are expected to be delivered pre-painted, however, some touch up to the project components is expected once they are installed. The new crude tanks will be coated on-site; therefore, most of the architectural coating will occur later in the construction schedule. The proposed project would use SCAQMD Rule 1113 compliant coatings, which limits the VOC emissions of the coating to 100 grams per liter (0.83 pounds per gallon). The estimated architectural VOC emissions during peak construction activities (Month 25) is 62.25 lb/day (see Table 4.2-2 and Appendix B-1).

Miscellaneous Emissions

Pre-project soil sampling and analysis have identified that hydrocarbons may be encountered during construction activities. Therefore, in addition to the construction-related emissions already identified, the proposed project could generate emissions of VOC if contaminated soil is found and soil remediation activities are necessary. Since the proposed project site has been identified as having soil containing VOC materials, excavation at this site is subject to the requirements of SCAQMD Rule 1166. The facility must obtain a SCAQMD-approved Rule 1166 Mitigation Plan to assure the control of fugitive emissions prior to the start of excavation activities. Rule 1166 includes requirements for SCAQMD notification at least 24 hours prior to the start of excavation, monitoring (at least once every 15 minutes, within three inches of the excavated soil surface), as well as implementation of a mitigation plan when VOC-contaminated soil is detected. Rule 1166 defines VOC contaminated soil as soil which registers a concentration of 50 ppmv or greater of VOC. An approved mitigation plan generally includes covering contaminated soil piles with heavy plastic sheeting and watering activities to assure the soil remains moist. In addition, VOC-contaminated soils shall be treated or removed within 30 days from the time of excavation. Soil remediation activities are also under the jurisdiction of the RWQCB. Following SCAQMD approval of the proposed project, a Soil Management Plan will be submitted to the RWQCB for approval. The RWQCB, when considering the Soil Management Plan, relies on the analysis in this EIR and the SCAQMD Rule 1166 Mitigation Plan. The quantification of VOC emissions from soil contamination is estimated to be a maximum of approximately 18 pounds per day (see Appendix B-1 for detailed calculations). VOC emissions from soil excavation activities are not shown in Table 4.2-2 because they are expected to occur during excavation activities, which happen in the early months of construction, and are not expected to occur when the peak VOC emissions occur, which is during painting of new storage tanks that occurs towards the end of construction.

Construction Emission Summary

Construction activities associated with the modifications to the Refinery would result in emissions of CO, VOC, NOx, SOx, PM10, and PM2.5. Construction emissions for the proposed project are summarized in Table 4.2-2, together with the SCAQMD's daily construction significance threshold levels. The construction phase of the proposed project will exceed the significance threshold for VOC and NOx. Therefore, unmitigated air quality impacts associated with construction are considered significant. Required mitigation is discussed in Section 4.2.3.

4.2.2.1.2 Localized Construction Air Quality Impacts

The SCAQMD has developed Localized Significance Threshold (LST) Methodology to evaluate the potential localized impacts of criteria pollutants from construction activities (SCAQMD, 2008). The LST Methodology requires that the emissions of CO, NO_2, PM10, and PM2.5 associated with a proposed project be evaluated for impacts on ambient air quality standards at local receptors. Impacts from other criteria pollutants are regional in nature or in attainment and, therefore, are not included as part of the localized air quality analysis. Furthermore, only on-site construction emissions sources are required to be included in the LST analysis. In typical construction projects involving multiple areas, heavy equipment such as cranes are shared and moved from area to area as necessary. However, the LST construction emissions analysis assumes that no project component would be sharing equipment, thus, providing a conservative estimate of the localized impacts of each project component during the peak months. The peak on-site construction emissions occur in Month 20 and were used for analyzing the localized impacts.

In order to determine the ground-level pollutant concentrations, the U.S. EPA AERMOD air dispersion model was used to model the peak day construction emissions (see Table 4.2-3) and calculate the annual average and maximum 1-hour, 8-hour, and 24-hour concentrations, as specified, for each pollutant. All active construction areas during the peak construction months were modeled as individual area sources geographically located at each unit.

TABLE 4.2-3

Localized Construction Air Quality Impact Analysis Results

Criteria Pollutant	Averaging Period	Modeled GLC ($\mu g/m^3$)	Background GLC ($\mu g/m^3$)[(a)]	Total GLC ($\mu g/m^3$)	Most Stringent Air Quality Standard ($\mu g/m^3$) [(b)]	Exceeds LST Threshold?
CO	1-hour	291.38	7,929.8	8,221.1	23,000	No
	8-hour	58.46	4,908.9	4,967.4	10,000	No
NO_2[(c)]	1-hour	200.43	255.5	455.9	339	Yes
	1-hour (Federal)	156.51[(d)]	146.30[(e)]	302.8	188	Yes
	Annual	4.99	47.7	52.7	57	No
PM10	24-hour	3.46	--	--	10.4	No
	Annual	0.86	--	--	1	No
PM2.5	24-hour	3.46	--	--	10.4	No
	Annual	0.86	--	--	1	No

GLC = ground-level concentration
(a) South Coastal LA County years 2011-2014 Station 033 and 072.
(b) SCAQMD CEQA thresholds. For PM10 and PM2.5, project comparison to incremental change.
(c) Impacts from air dispersion model are reported as using ambient ratio method.
(d) The federal 1-hour NO_2 standard is the 3-year average of the 98^{th} percentile. The modeled GLC used highest 98^{th} percentile per year.
(e) 98^{th} percentile background NO_2 value from the SCAQMD.

CO is in attainment; however, CO was included in the analysis for completeness. NO_2 emissions were estimated using the U.S. EPA recommended ambient ratio method (ARM), which converts NOx to NO_2 based on a fixed ratio (U.S. EPA, 2014). PM 2.5 was taken as equivalent to PM10 to present a conservative analysis. The details of the assumptions used in the modeling are provided in Appendix B-2.

To determine the significance of construction PM10 and PM2.5 emissions, proposed project emissions are compared to an incremental change in ambient air quality significance threshold (i.e., the SCAQMD established acceptable incremental increase significance thresholds for pollutants where the background concentration is greater than the most stringent ambient air quality standard). Once calculated, the PM10 and PM2.5 ground-level concentrations are directly compared to the appropriate incremental change in ambient air quality significance thresholds. Significance for localized PM10 and PM2.5 emissions is evaluated differently than CO or NO_2 because PM10 and PM2.5 already exceed the most stringent state or federal PM10 and PM2.5 ambient air quality standards in nearly all areas in the Basin. For the CO 1-hour, CO 8-hour, NO_2 1-hour, and NO_2 annual average significance determinations, ground-level concentrations from the proposed project are calculated, added to the background ambient concentrations and compared to the most stringent ambient air quality standard. If the result exceeds the most stringent ambient air quality standard for that pollutant, the localized impact is concluded to be significant. Because the SCAQMD's area of jurisdiction exceeds at least one ambient air quality standard for PM10 and PM2.5, it is classified as nonattainment for these criteria pollutants. As a result, PM10 and PM2.5 localized air quality impacts are compared to significance thresholds developed specifically for these two pollutants (SCAQMD, 2008). The localized air quality analysis results and significance conclusions are shown in Table 4.2-3 (see Appendix B-2 for more detailed calculations).

The LST analysis results indicate that NO_2 emissions at residential receptors are expected to exceed the significance thresholds in Table 4.2-3 from construction activities associated with the proposed project. The maximum ground-level concentrations for a residential receptor are expected to occur approximately 1,350 feet west of the Wilmington Operations. Therefore, the localized air quality impacts from the proposed project would be considered significant during construction. Required mitigation is discussed in Section 4.2.3.

4.2.2.2 Operational Emission Impacts

The proposed project's operational emissions are evaluated in this subsection. Direct daily operational emissions include stationary and mobile source emissions that are expected from the proposed project. Stationary sources include combustion sources, storage tanks, and fugitive sources. Mobile sources include trucks, trains, and marine vessels. Since the proposed project does not involve adding new employees, no new passenger vehicle trips are included in the analysis. Detailed operational emission calculations are provided in Appendix B-3. In addition to new or modified emission sources, the proposed project includes emission reductions resulting from the shutdown of one of the Refinery's two FCCUs, the Wilmington Operations FCCU, which is currently a major source of emissions. Peak daily emissions are expected to decrease for CO. However, peak daily emissions are expected to increase for VOC, NOx, SOx, PM10, and PM2.5. Table 4.2-4 summarizes the expected daily operational emissions for the proposed project.

Due to the complexity and duration of the Refinery integration, some project components are expected to be implemented prior to the shutdown of the Wilmington Operations FCCU (referred to as the Interim Operations Scenario). To assess the interim impact of the proposed project, the project components that will be operational in advance of the shutdown of the Wilmington Operations FCCU have been evaluated. Project components included in the Interim Operations Scenario include the Wilmington Operations DCU H-100 Heater Duty Bump, and fugitive emissions from the Wilmington Operations HCU and Carson HCU Mods, LHU Mods, and Mid Barrel Distillate Treater. Table 4.2-5 presents the operational emissions that are expected from the Interim Operations Scenario. The expected interim emissions are less than significant.

An additional transitional period is expected to occur to facilitate the integration of the Refinery and the shutdown of the Wilmington Operations FCCU. The transitional period is expected to be approximately 90 days prior to the Wilmington Operations FCCU shutdown, when Refinery units will become operational while the Wilmington Operations FCCU remains operating. The transitional period is expected to create a temporary increase in emissions that when combined with the concurrent ongoing construction of other portions of the proposed project will have significant air quality impacts (see Table 4.2-6). The 90-day transitional period results in significant VOC and NOx emission impacts that are less than the significant peak daily VOC, and NOx emissions from construction alone. Additionally, the 90-day transitional period results in less than significant CO emission impacts that are less than the peak daily CO emissions. However, the 90-day transitional period results in less than significant SOx, PM10 and PM2.5 emission impacts that are greater than the peak daily SOx, PM10, and PM2.5 emissions from construction alone. The transitional period operational emissions increase will cease and become the reduced emissions presented in Table 4.2-4 following the shutdown of the Wilmington Operations FCCU and completion of the proposed project.

TABLE 4.2-4
Tesoro Los Angeles Refinery
Proposed Project Operational Emissions Summary

Sources	Emissions (lb/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5[(a)]
Direct Emission Impacts from Stationary Sources						
Wilmington DCU H-100 Heater Duty Bump[(b)]	-0.43	-5.14	-171.03	86.69	-0.98	-0.98
Wilmington HCU H-300/301 Heater Duty Bump[(c)]	10.10	49.75	4.67	-14.98	10.79	10.79
SARP Process Air Heater	3.27	16.37	6.99	0.28	3.51	3.51
SARP Decomp. Furnace	6.88	34.39	2.45	0.59	7.37	7.37
SARP Converter Heater	0.82	4.09	1.75	0.07	0.88	0.88
SARP Process Vent	--	--	--	31.12	--	--
Wilmington Tanks	141.64	--	--	--	--	--
Wilmington Fugitive Emissions:						
CRU 3	10.24	--	--	--	--	--
Crude Tanks	3.61	--	--	--	--	--
HCU	20.69	--	--	--	--	--
HTU 1	3.50	--	--	--	--	--
HTU 2	3.80	--	--	--	--	--
HTU 4	6.32	--	--	--	--	--
Interconnect Piping	37.20					
PSTU	15.44	--	--	--	--	--
Sulfuric Acid Plant[(d)]	--	--	--	--	--	--
Wilmington FCCU Shutdown:[(e)]						
Wilmington FCCU and CO Boiler	-290.46	-909.62	-343.31	-387.50	-121.30	-121.30
Wilmington Heaters H2, H3/H4, and H5	-10.74	-49.36	-226.28	-28.87	-49.88	-49.88
Wilmington Startup Heater	-0.16	-0.81	-3.00	-0.01	-0.17	-0.17
Wilmington Fugitive Components	-17.60	--	--	--	--	--
Carson No. 51 Vacuum Unit Heater	32.85	233.85	32.72	1.80	45.49	45.49
Carson Naphtha HDS ULNB Conversion	1.73	10.23	1.87	0.64	5.56	5.56
Carson Crude Tanks	112.51	--	--	--	--	--
Carson Fugitive Emissions:						
No. 51 Vacuum Unit	11.74	--	--	--	--	--
Alkylation	18.88	--	--	--	--	--
Crude Tanks	43.05	--	--	--	--	--
Carson HCU Mods	6.77	--	--	--	--	--
Interconnect Piping	27.22	--	--	--	--	--
Carson LHU Mods	14.34	--	--	--	--	--
Carson LPG Railcar Unload	26.85	--	--	--	--	--
Carson Mid Barrel Distillate Treater	2.15	--	--	--	--	--
Carson Naphtha Isomerization Unit	9.46	--	--	--	--	--
Carson NHDS Mods	15.21	--	--	--	--	--
Carson Wet Jet Treater	50.45	--	--	--	--	--
Subtotal, Direct Stationary Source Emissions	**317.33**	**-616.25**	**-693.17**	**-310.17**	**-98.73**	**-98.73**

TABLE 4.2-4 (continued)

Sources	Emissions (lb/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5[(a)]
Indirect Emission Impacts from Stationary Sources						
Wilmington DCU Heater H-101	0.83	4.36	19.00	7.58	0.83	0.83
Wilmington HTU #3 Heaters H-30 and H-21/22	2.20	3.14	20.56	3.86	2.56	2.56
Wilmington CRU Heaters H-501A/B, H-502, H-503/504, and H-510	0.23	1.55	1.75	0.65	0.74	0.74
Wilmington Boilers 7, 8, 9, and 10	1.26	0.74	24.00	6.14	3.78	3.78
Wilmington SRP Boilers H-1601/1602	0.02	0.01	0.11	0.04	0.05	0.05
Wilmington SRP Incinerators F-704 and F-754	0.02	0.08	0.76	25.32	0.04	0.04
Wilmington Existing Tanks 80044, 80074, 80211, 80215, and 80217	4.12	--	--	--	--	--
Carson FCCU[(f)]	--	--	--	--	--	--
Carson HC Heater R-1	1.77	1.04	18.00	4.61	5.38	5.38
Carson HC Heater R-2	2.36	1.38	14.40	9.81	7.18	7.18
Carson LHU Heater	0.62	0.36	6.00	1.50	1.87	1.87
Carson Existing Tanks 14, 31, 62, 63, 64, 502, and 959	64.35	--	--	--	--	--
Watson Cogen Facility	4.15	4.50	20.60	2.50	9.85	9.85
Subtotal, Indirect Stationary Source Emissions	**81.93**	**17.16**	**125.18**	**62.01**	**32.28**	**32.28**
Mobile Sources[(g)(h)]						
Vehicle Emissions	0.03	0.20	0.73	<0.01	0.21	0.05
Rail Emissions – On-Site Maneuvering	0.66	2.01	11.65	<0.01	0.25	0.24
Rail Emissions – In Basin Transiting	1.20	7.60	25.80	<0.01	0.70	0.60
Subtotal, Mobile Source Emissions	**1.89**	**9.81**	**38.18**	**<0.01**	**1.16**	**0.89**
Total Project Emissions	**401.15**	**-589.28**	**-529.81**	**-248.15**	**-65.29**	**-65.56**
Required Regulation XIII Compliance[(i)]	**-317.33**	**--**	**--**	**--**	**--**	**--**
Prior Regulation XIII Compliance[(j)]	**-34.73**	**--**	**--**	**--**	**-9.85**	**-9.85**
Expected ERCs[(k)]	**--**	**--**	**--**	**--**	**76.30**	**76.30**
Expected RTCs to be Retained[(l)]	**--**	**--**	**491.63**	**248.14**	**--**	**--**
Total Project Emissions after Regulation XIII Compliance and ERC Generation[(m)]	**49.09**	**-589.28**	**38.18**	**<0.01**	**1.16**	**0.89**
Significance Threshold	**55**	**550**	**55**	**150**	**150**	**55**
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Note: Negative numbers represent emission reductions.

(a) PM10 emissions are assumed to be 100 percent PM2.5 emissions for stationary combustion sources.

(b) Negative numbers represent emission reductions as a result of permit limits imposed, which will reduce emissions to less than historically achieved.

(c) SOx emissions reduction expected due to fuel switch from refinery fuel gas to natural gas, which contains less sulfur.

(d) No fugitive VOC emissions are expected from the Sulfuric Acid Plant.

(e) Based on actual historical emissions.

(f) Peak daily emissions are not expected to change, but increased utilization will affect annual emissions.

(g) Peak day marine vessel emissions do not change as a result of the proposed project.

(h) On-road mobile source emissions represent vehicle trips only within the jurisdiction of the SCAQMD. On-road mobile source emissions projected to occur outside of the SCAQMD's area of jurisdiction are provided in Subsection 4.2.2.2.2.

TABLE 4.2-4 (concluded)

(i) Regulation XIII compliance requires offsetting the project direct stationary source emissions increases. Indirect stationary source emissions increases comply with Regulation XIII – New Source Review.
(j) Some indirect sources (i.e., Carson Tanks 14, 502, and 959, Wilmington H-101, and Carson R-2) have undergone prior new source review.
(k) ERCs for emission reductions are expected to be generated for PM10. No credits are issued for PM2.5 because it is a constituent of PM10.
(l) Local emission reductions of SOx and NOx will result from the project. Tesoro will retain RTCs from retiring the Wilmington Operations FCCU for operation of its Los Angeles Refinery.
(m) Regulation XIII compliance applied to significance determination reduces the VOC emissions to zero from stationary sources and ERCs are expected from emission reductions of PM10, so that the proposed project shows an emissions increase from mobile sources only.

As shown in Table 4.2-4, there are substantial emission reductions in CO from the proposed project. NO, SOx, PM10, and PM2.5 will have local emissions benefits, but will be regionally neutral as RTCs and Emission Reduction Credits (ERCs) will be retained or generated. VOC emission increases from direct stationary sources associated with the proposed project will be offset using concurrent emission reductions or as required by SCAQMD Regulation XIII for emission increases greater than one pound per day from newly permitted and modified existing permitted emission sources. Use of emission offsets will reduce potential air quality impacts associated with emission increases from stationary sources, including fugitive emissions. Equipment that will use concurrent emission reductions will be restricted by SCAQMD permit conditions to ensure the Wilmington Operations FCCU is shutdown to provide the necessary offsets. The draft Title V permit condition for the Carson Operations is expected to be as follows:

L341.XX Within 90 days after startup of this equipment the following devices shall be removed from operation:

(D96) FCCU Regenerator at Tesoro LAR Wilmington Operations (Facility ID: 800436)
(D112) CO Boiler at Tesoro LAR Wilmington Operations (Facility ID: 800436)
(D92) H-2 Steam Superheater at Tesoro LAR Wilmington Operations (Facility ID: 800436)
(D89) H-3 Fresh Feed Heater at Tesoro LAR Wilmington Operations (Facility ID: 800436)
(D90) H-4 Hot Oil Loop Reboiler at Tesoro LAR Wilmington Operations (Facility ID: 800436)
(D91) H-5 Fresh Feed Heater at Tesoro LAR Wilmington Operations (Facility ID: 800436)
(D1664) B-1 Startup Heater at Tesoro LAR Wilmington Operations (Facility ID: 800436)

A similar condition will be included in the Wilmington Operations permit. <u>Permit conditions will be imposed that limit operational impacts to those analyzed in this EIR.</u> For equipment that will use ERCs to comply with Regulation XIII, ERCs will be provided prior to startup. Additionally, although the project is expected to result in PM10 and PM2.5 emission reductions, these benefits have been removed from the summary in Table 4.2-4 because Tesoro will seek ERCs for the PM10. The availability of PM10 ERCs is dwindling and ERCs may be needed for future projects at the Los Angeles Refinery or elsewhere in the South Coast Air Basin.

TABLE 4.2-5

Tesoro Los Angeles Refinery
Proposed Project Interim Operational Emissions Summary

Sources	Emissions (lb/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5[a]
Direct Emission Impacts from Stationary Sources						
Wilmington DCU H-100 Heater Duty Bump[b]	-0.43	-5.14	-171.03	86.69	-0.98	-0.98
Wilmington Fugitive Emissions:						
HCU	20.69	--	--	--	--	--
Carson Fugitive Emissions:						
Carson HCU Mods	6.77	--	--	--	--	--
Carson LHU Mods	14.34	--	--	--	--	--
Carson Mid Barrel Distillate Treater	2.15	--	--	--	--	--
Subtotal, Direct Stationary Source Emissions	**43.52**	**-5.14**	**-171.03**	**86.69**	**-0.98**	**-0.98**
Indirect Emission Impacts from Stationary Sources						
Wilmington DCU Heater H-101	0.83	4.36	19.00	7.58	0.83	0.83
Wilmington HTU #3 Heaters H-30 and H-21/22	2.20	3.14	20.56	3.86	2.56	2.56
Wilmington CRU Heaters H-501A/B, H-502, H-503/504, and H-510	0.23	1.55	1.75	0.65	0.74	0.74
Wilmington Boilers 7, 8, 9, and 10	1.26	0.74	24.00	6.14	3.78	3.78
Wilmington SRP Boilers H-1601/1602	0.02	0.01	0.11	0.04	0.05	0.05
Wilmington SRP Incinerators F-704 and F-754	0.02	0.08	0.76	25.32	0.04	0.04
Wilmington Existing Tanks 80044, 80074, 80211, 80215, and 80217	4.12	--	--	--	--	--
Carson LHU Heater	0.62	0.36	6.00	1.50	1.87	1.87
Subtotal, Indirect Stationary Source Emissions	**9.30**	**10.24**	**72.18**	**45.09**	**9.87**	**9.87**
Total Project Emissions	**52.82**	**5.10**	**-98.85**	**131.78**	**8.89**	**8.89**
Required Regulation XIII Compliance[c]	**-43.52**	**--**	**--**	**--**	**--**	**--**
Prior Regulation XIII Compliance[d]	**-0.83**	**--**	**--**	**--**	**--**	**--**
Total Project Emissions after Regulation XIII Compliance	**8.47**	**5.10**	**-98.85**	**131.78**	**8.89**	**8.89**
Significance Threshold	**55**	**550**	**55**	**150**	**150**	**55**
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Note: Negative numbers represent emission reductions.

(a) PM10 emissions are assumed to be 100 percent PM2.5 emissions for stationary combustion sources.

(b) Negative numbers represent emission reductions as a result of permit limits imposed, which will reduce emissions to less than historically achieved.

(c) Regulation XIII compliance requires offsetting the project direct stationary source emissions increases. Indirect stationary source emissions increases comply with Regulation XIII – New Source Review.

(d) Indirect source Wilmington H-101has undergone prior new source review.

TABLE 4.2-6

Tesoro Los Angeles Refinery
Proposed Project Construction and 90-Day Transitional Period Operational Emissions Summary

Sources	Emissions (lb/day)					
	VOC	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5[(a)]**
CONSTRUCTION EMISSIONS						
Maximum Construction Emissions during Transitional Period[(b)]	**52.38**	**488.48**	**575.73**	**1.41**	**68.55**	**38.67**
TRANSITIONAL PERIOD OPERATIONAL EMISSIONS						
Emissions from Interim Operations[(c)]	**8.47**	**5.10**	**-98.85**	**131.78**	**8.89**	**8.89**
Direct Emission Impacts from Stationary Sources[(d)]						
Wilmington Fugitive Emissions:						
Interconnect Piping[(e)]	13.02	--	--	--	--	--
Carson Fugitive Emissions:						
Interconnect Piping[(e)]	9.53	--	--	--	--	--
Carson LPG Railcar Unload	26.85	--	--	--	--	--
Carson NHDS Mods	15.21	--	--	--	--	--
Subtotal, Direct Stationary Source Emissions	**64.61**	**--**	**--**	**--**	**--**	**--**
Indirect Emission Impacts from Stationary Sources						
Carson Existing Tanks 31 ,62 63, and 64	36.92	--	--	--	--	--
Subtotal, Indirect Stationary Source Emissions	**36.92**	**--**	**--**	**--**	**--**	**--**
Mobile Sources						
Rail Emissions – On-Site Maneuvering	0.66	2.01	11.65	<0.01	0.25	0.24
Rail Emissions – In Basin Transiting	1.20	7.60	25.80	<0.01	0.70	0.60
Subtotal, Mobile Source Emissions	**1.86**	**9.61**	**37.45**	**<0.01**	**0.95**	**0.84**
Total Construction and Transitional Period Project Emissions	**164.24**	**503.19**	**514.33**	**133.19**	**78.39**	**48.40**
Required Regulation XIII Compliance[(f)]	**-64.61**	**--**	**--**	**--**	**--**	**--**
Total Project Emissions after Regulation XIII Compliance	**99.63**	**503.19**	**514.83**	**133.19**	**79.39**	**48.40**
Significance Threshold	**55**	**550**	**55**	**150**	**150**	**55**
Significant?	**Yes**	**No**	**Yes**	**No**	**No**	**No**

(a) PM10 emissions are assumed to be 100 percent PM2.5 emissions for stationary combustion sources.
(b) The projected peak construction emissions during the transitional period are expected to occur in Month 18 (See Appendix B-1 Construction Emission Summary).
(c) From Table 4.2-5.
(d) The unmitigated construction emissions combined with the transitional period of operational emissions are expected to occur for the 90 days prior to the Wilmington Operations FCCU shutdown. At which time, emission reductions will occur (see Table 4.2-4).
(e) The emissions associated with the interconnecting piping have been reduced to reflect that prior to the shutdown of the Wilmington Operations FCCU only two pipes will be operational.
(f) Regulation XIII compliance requires offsetting the project direct stationary source emissions increases. Indirect stationary source emissions increases comply with Regulation XIII – New Source Review.

As discussed in Section 4.1.1, indirect impacts from equipment potentially impacted by the proposed project, but not part of the proposed project (i.e., upstream or downstream equipment that are not modified as part of the proposed project) were evaluated to determine if they contributed to an emissions increase, even though the equipment is operating within permit limits and no permit modification would be required. These indirect effects were analyzed and are included in the emissions impact of the proposed project (see Table 4.2-4). The overall change in emissions associated with implementing the proposed project is shown in Table 4.2-4 and detailed operational emission calculations are provided in Appendix B-3. The proposed project is expected to generate emission reductions of CO, which is considered an emissions benefit, and a less than significant increase in VOC, NOx, SOx, PM10, and PM2.5 emissions.

To assess the potential impacts of the proposed project on modified equipment, the proposed permitted firing rates were used to determine the potential maximum emissions from the proposed project during operation and compared to actual emission in the baseline years of 2012 and 2013. The baseline emissions are based on the actual achieved emissions less two percent of the maximum (also called the 98^{th} percentile) emissions reported under the SCAQMD RECLAIM and Annual Emissions Reporting programs for all affected combustion sources. The use of the 98^{th} percentile normalizes the achieved maximum from the peak value, to avoid any anomaly. The 98^{th} percentile is based on the US EPA's Primary National Ambient Air Quality Standards (NAAQS) for Nitrogen Dioxide (February 9, 2010) that established the 1-hour standard for NO_2 based on the 98th percentile of the yearly emissions (see Federal Register http://www.epa.gov/ttn/naaqs/standards/nox/fr /20100209.pdf). Since NOx is one of the primary pollutants emitted at refineries, there is substantial evidence to support the use of the 98^{th} percentile of emissions data in determining the daily actual baseline emissions. The heaters are natural gas-fired and the emissions for criteria pollutants, except NOx, have been calculated using SCAQMD Annual Emission Reporting default factors. NOx emission factors are based on manufacturer's performance guarantees, which are based on manufacturing testing. TAC emissions have been calculated using industry data or refinery-specific test data for similar units (see the discussion in Subsection 4.2.2.5). Detailed operational emission calculations are presented in Appendix B-3.

4.2.2.2.1 Stationary Sources

Combustion Sources

The proposed project contains new combustion sources, modifications to existing combustion sources, and shutdown of combustion sources in the FCCU at the Wilmington Operations. The proposed changes to SCAQMD permit conditions for existing combustion sources are presented in Table 4.2-7.

TABLE 4.2-7

Existing Combustion Sources Modified as Part of the Proposed Project

Source	New/ Modified (N/M)	Current Permitted Firing Rate (mmBtu/hr)	Proposed Permitted Firing Rate (mmBtu/hr)	Change (mmBtu/hr)
Wilmington FCCU Shutdown				
CO Boiler		300.0	0.0	-300.0
H-2		37.4	0.0	-37.4
H-3		94.7	0.0	-94.7
H-4		127.2	0.0	-127.2
H-5		44.0	0.0	-44.0
B-1 Startup Heater		84.0	0.0	-84.0
Wilmington HCU	M	71.1	96.1	25.0
Wilmington DCU	M	252.0	302.4	50.4
SARP	N		67.0	67.0
Carson NHDS[(a)]	M	12.5	12.5	0.0
Carson No. 51 Vacuum Unit	M	300.0	360.0	60.0
Total		**1,310.4**	**831.5**	**-478.9**

Note: Currently permitted firing rates are provided for information purposes only. Emissions analysis compared with actual baseline emissions, a more conservative analysis.
(a) Modification to install ultra-low NOx burner with no change in firing rate.

Storage Tanks

The proposed project includes six new crude storage tanks at the Carson Crude Terminal and two at Wilmington. The emissions associated with the operation of the new storage tanks were calculated using the U.S. EPA TANKS 4.0.9d Model and the associated User's Guide (U.S. EPA, 1999). Emissions increases associated with additional utilization of existing storage tanks were also calculated using the U.S. EPA TANKS 4.0.9d Model and the associated User's Guide with the increased throughput used to determine the incremental increase in emissions.

The TAC speciation for the storage tanks is based on a hybrid speciation of the maximum concentration of TACs from the materials expected to be stored. The hybrid speciation was developed to ensure that the evaluated data is the highest value (worst-case) of the properties in the data. This ensures that the TAC properties evaluated are conservative and represent the variety of materials that may be stored and processed.

Fugitive Component Emissions

Fugitive emissions are emissions into the atmosphere that are not directly emitted from permitted equipment through a stack, chimney, vent, or other functionally-equivalent opening. Fugitive emission sources that are part of the proposed project include flanges on pipes and equipment, pumps, valves, compressors, and gauges, which are referred to as fugitive components. Emissions from fugitive components are calculated using emission factors that account for component type and service type (i.e., the material being handled is a vapor, light liquid, or heavy liquid) based on Method 2 of the *SCAQMD Guide for Fugitive Emissions Calculations* (SCAQMD, 2003). The fugitive VOC emissions from the proposed project are summarized in Table 4.2-4 (see also Appendix B-3 for more detailed emission calculations).

All new and modified process components are required to conform to the SCAQMD's BACT Guidelines. Fugitive components or emission sources are also regulated under New Source Performance Standards (NSPS) Subpart GGG and SCAQMD Rule 1173. The BACT associated with each of the major project fugitive components is discussed in the following paragraphs.

Process Pumps: Seal-less pumps will be used in compliance with BACT requirements for pumps in light hydrocarbon service. For those instances where seal-less pumps are not appropriate, SCAQMD BACT Guidelines allow either double or tandem mechanical seals to be used. Tandem mechanical seals that use a barrier fluid and a seal pot vented to a closed system, and dry-running tandem mechanical seals vented to a closed system are considered to be equivalent control technologies since they provide equivalent control of fugitive VOC emissions. All pumps will be subject to an SCAQMD-approved inspection and maintenance program, as required under SCAQMD Rule 1173.

Process Valves: Bellow sealed valves will be installed on project fugitive components to reduce fugitive VOC emissions. The SCAQMD BACT/Lowest Achievable Emission Rate (LAER) Guidelines indicate that leak-less valves must be used, except for certain exempt applications.

For heavy hydrocarbon liquids and for applications where leak-less valves cannot be used, SCAQMD BACT Guidance allows the use of valves of standard API/ANSI design to be used. Fugitive VOC emissions from light liquid valves will be monitored and controlled in accordance with an SCAQMD-approved inspection and maintenance program, as required under SCAQMD Rule 1173.

Process Drains: New process drain lines will be provided with two normally closed block valves in series or a single block valve in series with a cap or plug as required under SCAQMD Rule 1173. New drain hubs (funnels) will be equipped with P-Traps and/or seal pots along with an SCAQMD-approved inspection and maintenance program, as required under SCAQMD Rule 1176.

Flanges: The use of flanged connections will be minimized to the extent practicable. Where required for maintenance or other operations, flanged connections will be designed in accordance with ANSI B16.5-1988, Pipe Flanges and Flanged Fittings. Fugitive emissions will be monitored and controlled in accordance with an approved inspection and maintenance program, as required under SCAQMD Rule 1173.

Pressure Relief Devices (PRDs): PRDs will be routed to the existing Refinery safety flare system, where required, to control VOC emissions in the event of upset conditions in accordance with SCAQMD Rule 1118.

4.2.2.2.2 Mobile Sources

Vehicle Emissions

The operation of the proposed project will involve the following changes to on-road vehicle traffic associated with the Refinery, within and outside of the SCAQMD's area of jurisdiction:

- There will be no increase in workers as compared to baseline conditions following completion of the construction phase because no new workers will be hired for operation of the proposed project.

- Eight trucks per day will transport spent sulfuric acid from the Carson Operations to the new SARP at Wilmington, while the six trucks per day that currently transport spent sulfuric acid from the Wilmington plant to a regeneration facility in Carson will be discontinued. While the number of trucks that will transport spent sulfuric acid will increase by two per day, the distance traveled per truck will be shortened. The net effect is that total vehicle mileage for the transportation of spent sulfuric acid will be reduced.

- Three trucks per day will transport spent caustic to the transfer facility adjacent to the Carson Operations.

- Three trucks per day will transport fresh caustic from a local supplier.

- One truck per day will transport other materials and supplies to or from the Refinery.

- <u>There will be no daily increase over baseline peak day activity of coke transport trucks to the Port of Long Beach. However, annual coke production may increase as result of the potential increase of up to 6,000 bbl/day in crude oil processed at the Wilmington Operations DCU H-100 heater. Therefore, the annual coke truck trips to the Port are expected to increase by 1,460.</u>

The emissions associated with truck traffic are calculated using EMFAC 2011 emission factors for T7 vehicles (heavy, heavy-duty trucks) (see Appendix B-5 for detailed emission calculations). On-road vehicle emissions from the proposed project that contribute to air quality impacts within the SCAQMD's area of jurisdiction are summarized and total project emissions are compared to the SCAQMD's air quality significance thresholds in Table 4.2-4.

Rail Locomotive Emissions

The proposed project includes the following increases in deliveries to and shipments from the Refinery by rail:

- Ten railcars per day of LPG will be delivered from various locations, which could arrive by three different routes depending on the provider.

- Four railcars per week of spent caustic will be shipped to the Gulf Coast for recycling.

It is expected that the additional railcars will be added to existing trains arriving at the Refinery. The rail emissions were calculated using the additional weight of the railcars for on-site maneuvering, transiting within the SCAQMD's area of jurisdiction, and transiting within California, but outside the SCAQMD's area of jurisdiction. The rail locomotive emissions from the proposed project within the South Coast Air Basin are summarized in Table 4.2-4 (see also Appendix B-5 for more detailed emission calculations).

The sourcing of LPG varies depending on market availability; therefore, the exact routing for deliveries may vary. Routes for the three most likely LPG sources, which include: (1) from Martinez, California (2) from the Nevada state line; and (3) from the Arizona state line, were analyzed. To determine the maximum potential impact of increased rail activity, each route was evaluated using the entire estimated rail activity. Rail emissions for transiting the lines were calculated in appropriate air districts to determine if the proposed project would have significant impacts elsewhere in California. Table 4.2-8 presents the potential emissions that could occur in the various air districts. The emissions are considered less than significant when compared to the CEQA thresholds that have been developed for each of the air districts (see Table 4.2-8).

Marine Vessel Emissions

Crude oil is received by pipeline to the Refinery from the marine terminals and other locations served by pipelines. There is no change proposed to crude oil throughput at the Carson Operations. However, at the Wilmington Operations, the crude oil unloading rate is proposed to be increased from the current rate of 5,000 bbl/hour to 15,000 bbl/hour, two new 300,000 bbl internal floating roof tanks are proposed, and 12-inch piping is proposed to be replaced with 24-inch piping within the Wilmington Operations. There are several benefits to be realized from increasing the crude unloading rate of marine vessels (i.e., ships). It decreases demurrage costs for detaining a marine vessel longer than necessary to unload its cargo. Decreasing demurrage translates directly into decreased marine vessel emissions as further described below. Additionally, as discussed in Section 4.1, a potential increase of up to 6,000 bbl/day of crude oil processing may occur at the Wilmington Operations as a result of the proposed project. The impacts of the proposed change in unloading rate and crude oil processing capability affect only Wilmington Operations and are analyzed herein.

Currently, the 5,000 bbl/hour transfer rate during crude oil unloading at the Wilmington Operations is limited by the vapor recovery system capacity on the fixed-roof crude oil storage tanks. Crude oil at the Wilmington Operations is currently stored in 16 fixed-roof storage tanks that are connected to vapor recovery and four internal floating roof tanks that are not required to be connected to vapor recovery. When a fixed-roof tank is filled, the displaced vapors are controlled in the vapor recovery system. The new internal floating roof tanks would allow marine vessels to unload at a faster rate of approximately 15,000 bbl/hour, which will reduce the amount of time the marine vessel needs to spend at berth or in the harbor and the associated marine vessel emissions per marine vessel visit. Marine vessel emissions while in transit to and from the berth will not be affected by the increase in crude unloading rate.

TABLE 4.2-8

Rail Emissions Outside the SCAQMD's Area of Jurisdiction

Air District[a]	Emissions											
	VOC		CO		NOx		SOx		PM10		PM2.5	
	lb/day	tons/yr	lb/day	tons/yr	lb/day	tons/yr	lb/day	tons/yr	lb/day	tons/yr	lb/day	tons/yr
BAAQMD	0.47	0.08	2.95	0.054	10.01	1.83	0.01	0.00	0.26	0.05	0.24	0.04
BAAQMD's CEQA Significance Threshold	54	10	--[b]	--	54	10			82	15	54	10
SJVAPCD	1.78	0.32	11.27	2.06	38.20	6.97	0.03	0.01	1.01	0.18	0.93	0.17
SJVAPCD's CEQA Significance Threshold	--	10	--	100	--	10			--	15	--	15
EKAPCD	0.49	0.09	3.12	0.57	10.56	1.93	0.01	0.00	0.28	0.05	0.26	0.05
EKAPCD's CEQA Significance Threshold	--	25	--	--	--	25			--	15	--	--
MDAQMD	0.82	0.15	5.21	0.95	17.65	3.22	0.01	0.00	0.47	0.08	0.43	0.08
MDAQMD's CEQA Significance Threshold	137	25	548	100	137	25			82	15	82	15
ICAPCD	0.62	0.11	3.92	0.72	13.3	2.43	0.01	0.00	0.35	0.06	0.32	0.06
ICAPCD's CEQA Significance Threshold	55	--	550	--	55	--	150	--	150	--	--	--
Significant?	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

(a) BAAQMD = Bay Area Air Quality Management District; SJVAPCD = San Joaquin Valley Air Pollution Control District; EKAPCD = Eastern Kern Air Pollution Control District; MDAQMD = Mojave Desert Air Quality Management District; ICAPCD = Imperial County Air Pollution Control District; -- = No threshold established.

(b) – means that the air district has not developed significance thresholds for that pollutant.

The Wilmington Operations currently receives crude oil shipments only in vessels of two size classes, Panamax (400,000 bbl capacity) and Aframax (720,000 bbl capacity) and will continue to receive crude oil in the same size vessels once the new tanks and pipeline within the Wilmington Operations become operational. Marine vessels larger than an Aframax cannot be handled at the Long Beach Marine Terminal because of its location within the Port of Long Beach and the water depth at the Marine Terminal location. The Wilmington Operations typically offload their entire allocation of crude oil on the marine vessel in one visit. Since there are currently no proposals by the Port of Long Beach to change the size of the berth and the water depth, these two factors are not expected to change at the Marine Terminal. Historically, marine vessel berth time has varied with an average of approximately 79 hours per marine vessel, which is expected to be reduced by up to 60 percent by improving the unloading rate from approximately 5,000 bbl/hour to approximately 15,000 bbl/hour, provided that all of the shipment is unloaded into the new and existing internal floating roof tanks. If a portion of the crude oil is unloaded into fixed roof tanks, the percentage reduction would be less (i.e., reduced by approximately 56 percent instead of 60 percent). Thus, the marine vessel emissions associated with auxiliary engines and boilers used while hoteling will be less. All other emissions associated with marine vessel deliveries (e.g., transiting, maneuvering, docking, etc.) are expected to remain the same. Peak day emissions occur when the marine vessel is transiting. Since no change in transiting activities is included in the proposed project, no change to peak day emissions is expected.

Two aspects of the proposed project have the potential to affect marine vessel emissions: (1) increasing the offloading rate is expected to decrease hoteling time and associated emissions, and (2) additional deliveries to accommodate the increased crude oil throughput of 6,000 bbl/day are expected to increase annual emissions. To analyze the net effect of the change in marine vessel activities, emissions per marine vessel visit as well as the annual deliveries were analyzed using the following methodology.

Since the proposed project does not affect the peak daily emissions, which occur while the marine vessel is transiting the harbor, the emission effects of unloading crude more quickly are best presented on a per marine vessel visit basis, converted to emissions per 1,000 bbl unloaded per trip. Emissions tabulated per marine vessel visit include inbound transit, maneuvering, docking, hoteling, outbound transit, and associated assist tugs. Table 4.2-9 contains a comparison of marine vessel emissions per 1,000 bbl unloaded. The analysis compares the emissions from delivery activities associated with the two types of marine vessels that currently deliver crude oil with the emissions from delivery activities with the faster unloading rate following implementation of the proposed project. Note that any unloading that would occur at the same rate as the current rate (i.e., 5,000 bbl/hr) would have the same emissions as current operations, so no emissions reduction per 1,000 bbl unloaded would occur. To unload the same volume of crude oil, a marine vessel would be in port at berth for less time under the proposed project. On a marine vessel visit basis (emissions per 1,000 bbl unloaded), emissions reductions for all pollutants are expected from the change from current marine vessel activities to the marine vessel activities once the proposed project is implemented (see Table 4.2-9 and Appendix B-5 for more detailed calculations). Considering the cargo capacity of Panamax and Aframax, emission reductions per marine vessel visit would be substantial.

The second parameter that would affect crude delivery marine vessel emissions is the potential increase of two percent (6,000 bbl/day) of crude oil processed at the DCU in the Wilmington Operations. This two percent increase represents approximately 2.2 million bbl/yr (calculated as 6,000 bbl/day x 365 days/yr = 2.19 million bbl/yr). To accurately assess the potential change in marine vessel emissions associated with delivery of the additional crude oil in a given year, the maximum number of additional marine vessels per year needed to transport the additional crude oil would be either six Panamax (5.5 marine vessels x 400,000 bbl/marine vessel) or three Aframax (3 marine vessels x 720,000 bbl/marine vessel). As discussed previously, the peak daily emissions associated with a marine vessel visit (when a marine vessel is transiting) are not expected to change, only annual emissions would be affected.

TABLE 4.2-9

Comparison of Existing and Project Marine Vessel Emissions per Visit

Marine Vessel Size	Emissions (lb/1,000 bbl unloaded)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Panamax - Project	0.9	2.1	23.8	0.8	0.11	0.09
Panamax - Existing	1.0	2.4	27.1	1.3	0.15	0.12
Panamax - Change[(a)]	-0.1	-0.3	-3.3	-0.5	-0.03	-0.03
Aframax - Project	0.6	1.5	16.7	0.7	0.09	0.07
Aframax - Existing	0.7	1.8	19.9	1.2	0.12	0.10
Aframax - Change[(a)]	-0.1	-0.2	-3.2	-0.6	-0.04	-0.03

Note: Negative numbers represent emission reductions. See Appendix B-5 for further details.

(a) Existing/Project is the difference in the marine vessel emissions for the specified size from current activities compared to the expected emissions from marine vessel activities once the proposed project is implemented. The current unloading rate is 5,000 bbl/hour and the proposed unloading rate is 15,000 bbl/hour for transfer to internal floating roof storage tanks. The marine vessel sizes presented are those that are currently used and will continue to be used at the Terminal. No change in marine vessel size can be accommodated at the Terminal because of physical limitations (e.g., water depth).

Table 4.2-10 presents the volume of crude oil received at the Marine Terminal for the Wilmington Operations during 2012 and 2013. On average, approximately 11 million bbl/yr of crude oil were delivered to the Wilmington Operations in 2012-2013. While Panamax and Aframax will continue to deliver crude oil to the Wilmington Operations, the future number of each type of marine vessel visiting the Marine Terminal is unknown, making precise quantification of emission reductions difficult. However, an analysis where all of the annual crude deliveries are made by Panamax marine vessels compared to an analysis where all of the annual crude deliveries are made by Aframax marine vessels will capture the maximum annual marine vessel emission reductions per 1,000 bbl compared to the minimum annual marine vessel emission reductions per 1,000 bbl, respectively. As shown in Table 4.2-11, on an annual basis, marine vessel emission decreases are expected from the proposed project. See Appendix B-5 for additional information regarding calculating marine vessel emissions before and after implementing the proposed project. The net emission reductions effects take into account the additional marine vessel trips per year resulting from the two percent crude throughput increase for both types of crude delivery marine vessels as well as the faster offloading rate. As discussed in Chapter 2, no changes to the Crude Units are being made that would affect the crude oil throughput of the Wilmington Operations and the only change to crude oil throughput from the proposed project is the potential of up to 2.2 million bbl/yr analyzed herein. Thus, the emissions reduction from the reduced hoteling sufficiently compensates for the additional marine vessels potentially needed to deliver the 2.2 million bbl/yr of crude and also reduce marine vessel emissions annually.

TABLE 4.2-10

Crude Oil Deliveries via Marine Vessel to the Marine Terminal

Year	Volume (million bbl)
2012	12.616
2013	9.254
2012/2013 Average	10.940

Source: EIA, 2015a.

TABLE 4.2-11

Comparison of Current and Post-Project Marine Vessel Emissions on an Annual Basis

Marine Vessel Size	Emissions (lb/yr/1,000 bbl unloaded)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Panamax - Project[(a)]	9.6	23.1	260.8	8.5	1.2	1.0
Panamax - Existing	13.2	31.8	356.1	16.5	1.9	1.6
Panamax - Change[(a)]	-3.6	-8.6	-95.3	-8.0	-0.7	-0.6
Aframax - Project[(a)]	6.9	16.9	182.3	7.1	1.0	0.8
Aframax - Existing	9.8	23.3	261.0	16.1	1.6	1.3
Aframax - Change[(b)]	-2.9	-6.5	-78.6	-9.0	-0.7	-0.6

Note: Negative numbers represent emission reductions. See Appendix B-5 for further details.

(a) Project emissions include the effects of the increase in annual emissions from increasing the number of marine vessel visits per year due to the two percent increase in crude throughput minus the reduction in annual emissions from the reduced time necessary to offload the crude.

(b) The actual mix of Panamax and Aframax varies. The comparison shows the range of emission reductions if all the crude oil was delivered by a single marine vessel type. The actual emission reductions would be within the range shown.

Unmitigated daily operational emission effects from all proposed project emissions sources are summarized in Table 4.2-4, together with the SCAQMD daily operational significance thresholds. The operation of the proposed project is not expected to exceed any significance thresholds. Additionally, vehicle and rail emissions outside the SCAQMD jurisdiction summarized in Table 4.2-8 are not expected to exceed any applicable AQMD/APCD significance thresholds. Therefore, the air quality impacts associated with operational emissions from the proposed project are not considered significant.

4.2.2.3 CO Hot Spots

The potential for high concentration of CO emissions associated with truck/vehicle traffic was considered and evaluated per the requirements of the SCAQMD CEQA Air Quality Handbook (SCAQMD, 1993). The Handbook indicates that any project that could negatively impact levels of service at local intersections may create a CO hot spot and should be evaluated. As evaluated in Section 4.7, no changes in level of service are expected from the proposed project following mitigation. Therefore, no significant adverse impacts to ambient CO air quality due to the traffic impacts at intersections in the vicinity of the proposed project are expected, so no mitigation is required.

4.2.2.4 Localized Air Quality Impacts

Dispersion modeling was used to calculate ambient air concentrations of the criteria pollutants from the proposed project on-site stationary sources and on-site rail emissions, which emit CO, NOx, SOx, PM10, and PM2.5 emissions and to determine the localized air quality impacts. In order to determine ground-level concentrations, the U.S. EPA AERMOD (version 15181, which is the most recent version available at the time of the analysis) air dispersion model was used to predict the ambient concentrations for CO, NOx, SOx, and PM10 (ambient air quality standards have not been established for VOC and therefore is not required to be modeled). Since PM2.5 emissions are a fraction of PM10 emissions and the significance thresholds are the same for PM10 and PM2.5, PM2.5 emissions were not modeled but were based on the modeling results for PM10.

Emissions of CO, NOx, SOx, and PM10 were modeled using the appropriate averaging times for each pollutant. Averaging times modeled include one, eight, and 24 hours and annual, which are based on the averaging times used to derive the applicable ambient air quality standard. The emission rates, locations, and ground-level concentrations are included in Appendix B-3. The calculated impacts of the proposed project on ambient air pollutant concentrations of the modeled criteria pollutants are presented in Table 4.2-12.

Based on the AERMOD air dispersion model results, the ground-level concentrations of the criteria pollutants of concern will be below SCAQMD CEQA significance thresholds at all off-site receptor locations. Therefore, no significant adverse localized air quality impacts are anticipated to occur from the operation of the proposed project.

4.2.2.5 Toxic Air Contaminants

A health risk assessment (HRA) was performed to determine if emissions of TACs generated by the proposed project would exceed the SCAQMD thresholds of significance for cancer risk and hazard indices (for non-cancer health impacts). The following subsections outline the HRA methodology. A summary of the results of the HRA are presented in Table 4.2-13. The HRA evaluated the emissions associated with the operation of the proposed project and determined the carcinogenic and non-carcinogenic impacts for all off-site receptors are expected to be less than the applicable significance thresholds. The HRA summarized herein evaluates only the emission increases from the proposed project, and does not take emission reduction credit for emissions decreases associated with proposed project components. This approach provides a conservative analysis of the proposed project impacts. A detailed HRA can be found in Appendix B-4.

TABLE 4.2-12

Results of Criteria Pollutants Air Quality Modeling

Criteria Pollutant	Averaging Period	Modeled GLC ($\mu g/m^3$)	Background GLC. ($\mu g/m^3$)[(a)]	Total GLC ($\mu g/m^3$)	Most Stringent Air Quality Standard ($\mu g/m^3$) [(b)]	Exceeds LST Threshold?
CO	1-hour	~~10.4~~11.2	4,809.0	~~4,819.4~~4,820.2	23,000	No
	8-hour	~~3.6~~5.1	2,977.0	~~2,980.6~~2,982.1	10,000	No
NO_2[(c)]	1-hour	~~45.9~~48.5	255.5	~~301.4~~304.0	339	No
	1-hour (Fed.)[(d)]	~~38.6~~40.8	146.3[(e)]	~~184.9~~187.1	188	No
	Annual	2.1	47.6	49.7	57	No
SO_2	1-hour	6.5	64.9	71.4	655	No
	1-hour (Fed.)[(f)]	6.5	40.0	46.6	196	No
	24-hour	0.6	64.9	65.5	105	No
PM10	24-hour	0.42	--	--	2.5	No
	Annual	~~0.16~~0.52	--	--	1.0	No
PM2.5	24-hour	0.42	--	--	2.5	No

(a) South Coastal LA County 3 years 2012-2014. Maximum value of the three years was used, except concentrations used to compare with federal standards were averages.
(b) SCAQMD CEQA thresholds. For PM10 and PM2.5, project comparison to incremental change.
(c) Impacts from air dispersion model are reported as NOx. NO_2 converted from NOx by using default factor of 0.8 for hourly and 0.75 for annual, per 9/30/2014 Memorandum from R Chris Owen and Roger Brode, U.S. EPA Air Quality Modeling Group, to Regional Air Division Directors re: Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO2 NAAQ.
(d) Federal standard is the 98th percentile concentration, averaged over three years.
(e) 98th percentile background NO_2 value from the SCAQMD.
(f) Federal standard is the 99th percentile concentration, averaged over three years.

TABLE 4.2-13

Tesoro Refinery
HRA Results

Maximally Exposed Individual[(a)]	Increased Cancer Risk (per million)	Chronic Hazard Index	8-Hour Chronic Hazard Index	Acute Hazard Index[(b)]
Residential Receptor[(c)]	~~3.6~~ 3.7	~~0.049~~ 0.030	0.006	0.052
Off-site Workplace Receptor	~~9.2~~ 9.3	~~0.127~~ 0.106	0.108	0.052
Sensitive Receptors[(d)]	2.1	~~0.054~~ 0.025	0.005	0.010
Significance Threshold	**10**	**1.0**	**1.0**	**1.0**
Significant?	**No**	**No**	**No**	**No**

(a) Excludes onsite grid receptors.
(b) Fenceline receptors were conservatively included as potential residential and worker receptors for determination of maximum acute risk.
(c) Worst-case residential receptor.
(d) Maximum non-residential sensitive receptors: Cancer risk: Bethune Mary School; Chronic risk: Long Beach Japanese School; 8-Hr Chronic Risk: Bethune Mary School; and, Acute risk: Bethune Mary School

HRA Methodology

The HRA analysis for the proposed project began prior to the release on March 6, 2015, of the update to the HRA guidance by the Office of Environmental Health Hazard Assessment (OEHHA). The 2015 OEHHA Air Toxics Hot Spots Program Guidance Manual contained substantial changes to the HRA methodology relating to health effect values, exposure pathway variates (e.g., breathing rates), application of weighting to early age exposure (i.e., a ten-fold adjustment factor for less than two years of age and three-fold adjustment factor for two to sixteen years of age), and adjustment of exposure duration for residential and occupational worker receptors. Formal guidance has been developed by the SCAQMD for implementing the OEHHA updated guidance and was approved by the SCAQMD Governing Board on June 5, 2015. The HRA conforms with the 2015 SCAQMD guidance. The HRA includes a comprehensive analysis of the dispersion of certain AB2588-listed compounds into the environment, the potential for human exposure, and a quantitative assessment of individual health risks associated with the predicted levels of exposure. CARB Hotspots Analysis Reporting Program (HARP2, version 15197) model is the most appropriate model for determining the air quality impacts from the proposed project (CARB, 2015).

The HARP model is well suited for refinery modeling since it can accommodate multiple sources and receptors. The HARP2 model utilizes AERMOD to determine ground-level concentrations used in the health risk calculations. Consistent with SCAQMD modeling guidance, increased cancer risks associated with locomotive diesel particulate matter (DPM) exhaust emissions were determined using a simplified approach. AERMOD was used to calculate ambient DPM concentrations associated with locomotive activity, and the resulting DPM concentrations at each receptor were multiplied by composite risk factors to calculate increased cancer risks for residential and off-site worker exposure. The model default values were modified to conform to the SCAQMD Supplement Guidelines for Preparing Risk Assessment for the Air Toxics “Hot Spots” Information and Assessment Act (AB2588) (SCAQMD, 2015b).

A complete description of the HRA methodology is provided in Appendix B-4.

Hazard Identification

The proposed project generates various air contaminants. Some of these chemical compounds are potentially carcinogenic, non-carcinogenic (adverse health effects other than cancer, such as birth defects, reproductive defects, mutagenicity, etc.), toxic, or hazardous, depending on concentration or duration of exposure. Numerous federal, state, and local regulatory agencies have developed lists of TACs. The list of potentially-emitted substances considered in the preparation of the HRA for the proposed project is identified in Appendix A-I of the CARB AB2588 requirements and by OEHHA. The AB2588 TACs emitted from the proposed project are shown in Appendix B-3. Some of these pollutants were consolidated into one category, e.g., polycyclic aromatic hydrocarbons (PAHs). Health effects data are not available for all compounds. However, a total of 71 TACs were included in the air dispersion modeling (see Appendix B-3). For carcinogens, slope factors were used to compute cancer risk through inhalation. If the carcinogen is a multi-pathway pollutant, a potency slope was used for estimation of risk from non-inhalation pathways. For non-cancer health effects, reference exposure levels (REL) and acceptable oral doses (for multi-pathway pollutants) were used. The non-carcinogenic hazard indices were computed for chronic and acute exposures with their respective toxicological endpoints shown.

Emission Estimations and Sources

The purpose of the HRA for the proposed project was to evaluate the risk associated with changes in emissions resulting from the integration of the Wilmington and Carson Operations. Emission changes are summarized below:

> **Modified combustion sources**: Hourly emission rates from modified sources were based on the actual 2012/2013 *daily* emissions compared to maximum potential-to-emit emissions once the proposed project becomes operational. Annual emission rates were based on actual 2012/2013 *annual* emissions compared to potential-to-emit emissions once the proposed project becomes operational.
>
> **Non-modified combustion sources**: Emission rates for equipment not modified as part of the proposed project, but where an increase in operational activity is expected were estimated based on the anticipated increase in operating rate of the unit.
>
> **Storage tanks**: Pre-project storage tank emissions from existing tanks were based on 2012/2013 actual daily emissions; project storage tank emissions were based on estimated maximum potential-to-emit emissions upon operation of the proposed project.
>
> **Process unit piping component fugitives**: Total daily emissions were based on emission rates and the number and type of piping components to be installed.
>
> **Locomotive DPM**: Emissions increase in DPM was based on the estimated increase in locomotive activity associated with increased railcar movement of LPG, in-transit and idling on-site and just outside facility fence line.
>
> **New Emission Sources:** Emission rates for new sources (e.g., Wet Jet Treater at the Carson Operations; and PSTU, and SARP at the Wilmington Operations) were based on maximum potential-to-emit emissions on hourly and annual emissions.

Details of the emission calculations for stationary sources and locomotive-related emissions are presented in Appendix B-3.

Cancer Risk Analysis

The predicted increase in health risks at maximally exposed off-site receptors using HARP2 models are summarized by category in Table 4.2-13. The maximum cancer risk from the proposed project for an exposed individual resident (MEIR) is located just west of the western boundary of the Refinery nearest to the new crude tanks. The increased incremental cancer risk is 3.6 in one million at the MEIR, which is below SCAQMD's 10 in one million significance threshold. Therefore, the cancer risk at the MEIR is not significant. Detailed cancer risk contributions are presented in Appendix B-4.

The maximum incremental increase in cancer risk from the proposed project at the occupational maximum exposed individual worker (MEIW) (off-site worker) receptor is located near the railroad tracks at the northeastern boundary of the facility. The increased incremental cancer risk is 9.2 in one million at the MEIW which is below SCAQMD's 10 in one million significance threshold. Therefore, the cancer risk at the MEIW is not significant. Detailed cancer risk contributions are presented in Appendix B-4.

The maximum cancer risk from the proposed project for a non-residential sensitive receptor is located at Bethune Mary School, which is approximately 100 meters east of the eastern boundary of the Wilmington Operations. The increased incremental cancer risk is 2.1 in one million at Bethune Mary School which is below SCAQMD's 10 in one million significance threshold. Therefore, the cancer risk at the nearest non-residential sensitive receptor is not significant. Detailed cancer risk contributions are presented in Appendix B-4.

Cancer Burden

Cancer burden was calculated to estimate the increase in cancer cases in the population. Cancer burden was conservatively estimated by using as a screening calculation, where a default residential population density (for residential and commercial/industrial areas) and the worst-case cancer risk were combined. The cancer burden was calculated to be 0.44, which is below the SCAQMD's significance threshold of 0.5. Therefore, the cancer burden is not significant. Additional discussion of the cancer burden calculation is presented in Appendix B-4.

Non-Cancer Risk Analysis

The analysis of non-cancer health impacts is performed using a different methodology than a cancer risk analysis. Non-cancer health risk estimates are shown in terms of a hazard index (HI), either maximum chronic HI for long-term exposures or maximum acute HI for short-term exposures (one hour) to non-carcinogenic TAC emissions.

The maximum chronic hazard index (MCHI) is located just east of the southern portion of the facility. The MCHI for the proposed project is 0.127, which is below SCAQMD's chronic hazard index significance threshold of 1.0. Therefore, the peak chronic non-cancer health hazards generated by the proposed project are considered to be less than significant. Detailed contribution to the chronic hazard index for the maximum receptor location is presented in Appendix B-4.

The maximum 8-hour chronic hazard index is located on the northwestern boundary of the Wilmington Operations. The maximum 8-hour chronic hazard index for the proposed project is 0.108, which is below SCAQMD's chronic hazard index significance threshold of 1.0. Therefore, the peak chronic non-cancer health hazards generated by the proposed project are considered to be less than significant. Detailed contribution to the chronic hazard index for the maximum receptor location is presented in Appendix B-4.

The maximum acute hazard index (MAHI) is located just west of the southern portion of the facility. The MAHI for the proposed project is 0.052, which is below the 1.0 significance threshold. Therefore, the acute hazards generated by the proposed project are considered to be less than significant. Detailed contribution to the acute hazard index for the maximum receptor location is presented in Appendix B-4.

4.2.2.6 Summary of Health Impacts

The health impacts related to air quality impacts from the proposed project have been evaluated in several ways. First, the short-term air quality impacts related to construction emissions were evaluated by comparing the peak day construction emissions to the SCAQMD mass daily significance thresholds. In the short-term, the air quality impacts related to construction emissions would exceed the SCAQMD significance thresholds for VOC~~, CO,~~ and NOx and are considered to have a significant air quality impact. In order to evaluate the health impacts associated with criteria pollutant construction emissions, an LST analysis was also completed. The results of the LST analysis indicated that the short-term construction emissions would exceed the applicable LST NO_2 significance thresholds. The LST significance thresholds for NO_2 is based on the most stringent ambient air quality standard for NO_2, which in turn are based on the pollutant concentration observed to cause adverse human health effects (see Table 3.2-1). Since the area of the SCAQMD's jurisdiction is non-attainment for PM2.5 and PM10, a different LST methodology was used to derive their construction and operational significance thresholds (SCAQMD, 2008). Since construction of the proposed project is short-term and would exceed the LST significance thresholds for local ambient air quality, adverse health impacts associated with construction emissions could occur in industrial and residential areas or pedestrian walkways near the Refinery. The primary health effects associated with exposure to VOC <u>and</u> NO_2~~, and CO,~~ are respiratory impacts including decreased lung function, aggravation of chronic respiratory condition, and aggravation of heart disease conditions. Any adverse health impacts are only expected during the construction phase of the proposed project and would only be temporary. Upon completion of construction, operational VOC <u>and</u> NO_2~~, and CO,~~ emissions are considered less than significant, so localized operational air quality impacts for these pollutants were concluded to be less than significant.

The long-term air quality impacts from exposure to toxics were evaluated through the preparation of an HRA. The HRA evaluated toxic air contaminant emissions associated with the operation of the proposed project and compared them to carcinogenic and non-carcinogenic significance thresholds to determine potential health impacts. As demonstrated in the HRA, the carcinogenic and non-carcinogenic impacts for all receptors are expected to be less than the applicable significance thresholds. Therefore, no significant adverse carcinogenic or non-carcinogenic health impacts associated with the operation of the proposed project are expected.

Epidemiological analyses have consistently linked air pollution, especially PM, with excess mortality and morbidity. Health studies have shown both short-term and long-term exposures of ambient PM concentrations are directly associated with increased mortality and morbidity. Since the air quality analysis shows that the operational PM emissions from the proposed project are not changing and do not have off-site consequences (i.e., no concentrations above the ambient air quality standards), no increase in morbidity or mortality rates or related health effects are anticipated.

The indirect PM emissions associated with the proposed project are limited to an increase in truck trips and railcars. The potential annual increase in truck trips or railcars does not produce a localized increase in PM, but is dispersed along the route. Therefore, no significant air quality and corresponding health impacts are expected due to the proposed project.

4.2.3 MITIGATION MEASURES

Feasible mitigation measures are required, if available, to minimize the significant air quality impacts associated with the construction phase of the proposed project as the emissions of VOC~~,~~ ~~CO,~~ and NOx are considered significant.

As shown in Table 4.2-4, upon completion of the proposed project, operation of the proposed project will result in operational emission reductions for CO, and less than significant increases in VOC, NO, and SOx, PM10, and PM2.5 of 2.46 lb/day, 52.05 lb/day, less than 0.01 lb/day, 5.05 lb/day, and 1.94 lb/day, respectively, from mobile sources associated with the proposed project. As shown in Table 4.2-6, the 90-day transitional period associated with integrating the Refinery and shutting down the Wilmington Operations FCCU, will overlap with construction activities. The employment of the construction mitigation measures identified below will reduce construction impacts. No significant operational impacts were identified. Therefore, no operational mitigation is required; however, to reduce the construction emissions impacts, one feasible operational mitigation measure has been identified and imposed.

Construction Mitigation Measures

The proposed project is expected to have significant adverse air quality impacts during the construction phase. While the construction schedule of the proposed project spans approximately five years, most of the project construction will be completed in the first two years to facilitate the retiring of the Wilmington Operations FCCU. While construction emissions are significant, once the Wilmington FCCU is shut down, the local emissions benefit from the shutdown is far greater than the temporary localized construction emissions. Therefore, the following mitigation measures will be imposed on the project to reduce emissions associated with construction activities from heavy construction equipment and worker travel.

A-1 Maintain the Construction Management Program for the proposed project that shall, at a minimum, incorporate the following mitigation measures and Best Management Practices.

<u>On-Road Mobile Sources:</u>

A-2 Prohibit vehicles from idling longer than five minutes at the Refinery as contract conditions with construction companies and by posting signs on-site, except as provided in the exceptions in the applicable CARB regulations regarding idling.

A-3 All on-road heavy-duty diesel trucks or equipment with a gross vehicle weight rating (GVWR) of 19,500 pounds or greater shall comply with EPA 2007 on-road emission standards for PM and NOx (0.01 gram per brake horsepower - hour (g/bhp-hr) and at least 0.2 g/bhp-hr, respectively).

Off-Road Mobile Sources:

A-4 Prohibit construction equipment from idling longer than five minutes at the Refinery as contract conditions with construction companies and by posting signs on-site, except as provided in the exceptions in the applicable CARB regulations regarding idling.

A-5 The project proponent shall survey and document the proposed project's construction areas and identify all construction areas that are served by electricity. This documentation shall be provided as part of the Construction ~~Emissions~~ Management ~~Plan~~ Program. Electric welders shall be used in all construction areas that are demonstrated to be served by electricity. Electric power tools shall be used in areas when feasible and available.

A-6 The project proponent shall survey and document the proposed project's construction areas and identify all construction areas that are served by electricity. This documentation shall be provided as part of the Construction Management Program. On-site electricity rather than temporary power generators shall be used in all construction areas that are demonstrated to be served by electricity.

A-7 For off-road construction equipment rated greater than 50 hp, the project proponent shall use equipment that meets Tier 4 off-road emission standards at a minimum. Any emissions control device used by the Contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations. The project proponent shall provide documentation in the Construction ~~Emissions~~ Management ~~Plan~~ Program or associated subsequent status reports as information becomes available that equipment rated greater than 50 hp equipped with Tier 4 engines are not available.

A-8 Suspend use of all construction activities that generate air pollutant emissions during first stage smog alerts.

Exceptions

Mitigation measure ~~A-2 through A-8~~ A-3 and A-7 for on-road and off-road construction equipment and generator requirements shall apply unless any of the following circumstances exist and the project proponent and its contractor provides a written finding consistent with project contract requirements that:

1) The project proponent and its contractor intends to meet the requirements of these mitigation measures as to a particular vehicle or piece of equipment by leasing or short-term rental, and the project proponent and its contractor has attempted in good faith and due diligence to lease the vehicle or equipment that would comply with this policy, but that vehicle or equipment is not available for lease or short-term rental within 200 miles of the project site, and the Contractor has submitted documentation to Tesoro showing that the requirements of this Exception provision apply; or

2) The contractor has been awarded funding by SCAQMD or another agency that would provide some or all of the cost to retrofit, repower, or purchase a piece of equipment or vehicle, but the funding has not yet been provided due to circumstances beyond the contractor's control, and the contractor has attempted in good faith and due diligence to lease or short-term rent the equipment or vehicle that would comply with this policy, but that equipment or vehicle is not available for lease or short-term rental within 200 miles of the project site, and the contractor has submitted documentation to Tesoro showing that the requirements of this Exception provision apply; or

3) The contractor has ordered for purchase, a piece of equipment or vehicle to be used on the construction project in compliance with this policy at least 60 days before that equipment or vehicle is needed at the project site, but that equipment or vehicle has not yet arrived due to circumstances beyond the contractor's control, and the contractor has attempted in good faith and due diligence to lease or short-term rent a piece of equipment or vehicle to meet the requirements of this policy, but that equipment or vehicle is not available for lease or short-term rental within 200 miles of the project, and the contractor has submitted documentation to Tesoro showing that the requirements of this Exception provision apply; or

4) Construction-related diesel equipment or vehicles will be used on Tesoro construction project site for fewer than 10 calendar days per calendar year. The contractor shall not consecutively use different equipment or vehicles that perform the same or a substantially similar function in an attempt to use this Exception to circumvent the intent of this policy.

In any of the Mitigation Measures and Exceptions described above, the contractor shall provide the next cleanest piece of equipment or vehicle as provided by the step down schedules in Table A for Off-Road Equipment and Table B for On-Road Equipment.

Table A. Off-Road Compliance Step Down Schedule*

Compliance Alternative	Engine Standard	CARB-Verified DECS (VDECS)
1	Tier 4	N/A
2	Tier 3	Level 3
3	Tier 2	Level 3
4	Tier 1	Level 3
5	Tier 2	Level 2
6	Tier 2	Level 1
7	Tier 2	Uncontrolled
8	Tier 1	Level 2
Equipment less than Tier 1, Level 2 shall not be permitted.		

Note: DECS=diesel emissions control system

Table B. On-Road Compliance Step Down Schedule*

Compliance Alternative	Engine Model Year	CARB-Verified DECS (VDECS)
1	2010	N/A
2	2007	N/A
3	2004	Level 3
4	1998	Level 3
5	2004	Uncontrolled
6	1998	Uncontrolled
Equipment with a model year earlier than Model Year 1998 shall not be permitted.		

*How to use Table A and Table B: For example, if Compliance Alternative #3 is required by this policy but a Contractor cannot obtain an off-road vehicle that meets the Tier 2 engine standard that is equipped with a Level 3 DECS (Compliance Alternative #3 in Table A) and meets one of the above exceptions, then the Contractor shall use a vehicle that meets the next compliance alternative (Compliance Alternative #4) which is a Tier 1 engine standard equipped with a Level 3 DECS. Should the Contractor not be able to supply a vehicle with a Tier 1 engine equipped with a Level 3 DECS in accordance with Compliance Alternative #4 and has satisfied the requirements of one of the above exceptions as to the Contractor's ability to obtain a vehicle meeting Compliance Alternative #4, the Contractor shall then supply a vehicle meeting the next compliance alternative (Compliance Alternative #5), and so on. If the Contractor is proposing an exemption for on-road equipment, the step down schedule in Table B should be used. A Contractor must demonstrate that it has satisfied one of the exceptions listed in the selected Compliance Alternative # before it can use a subsequent Compliance Alternative. The goal is to ensure that the Contractor has exercised due diligence in supplying the cleanest fleet available.

Best Management Practices

In addition to equipment requirements, the Best Management Practices (BMPs) listed below are to be included in the Construction Management Program and imposed on all construction projects performed on Tesoro properties and rights-of-way.

BMPs shall include, at a minimum:

1) Maintain equipment according to manufacturers' specifications;

2) Restrict idling of construction equipment and on-road heavy-duty trucks to a maximum of 5 minutes when not in use, except as provided in the exceptions to the applicable CARB regulations regarding idling for off-road and on-road equipment;

3) Maintain a buffer zone that is a minimum of 1,000 feet between on-road truck traffic and sensitive receptors, where feasible;

4) Prohibit parking on public streets.

5) Prepare haul routes that conform to local requirements to minimize traversing through congested streets or near sensitive receptor areas;

6) Schedule construction activities that affect traffic flow on the arterial system to off-peak hours to the extent practicable;

7) Use electric power in lieu of diesel power where available; and

8) Traffic speeds on all unpaved roads to be 15 mph or less.

Stationary Source Mitigation

Once direct construction mitigation is implemented, the duration of significant NOx emissions will be reduced from the first 30 months to the first 24 months of construction. In addition to mitigation measures directly reducing emissions from construction equipment, Tesoro examined possible operational mitigation measures to further mitigate NOx emissions during construction of the proposed project. The identified feasible operational mitigation is the early implementation of NOx reduction projects that are planned for future regulatory compliance. Tesoro has determined that it can upgrade or change the catalyst in three SCRs currently operating as emission controls for NOx, to obtain some of the emission reductions needed to implement the recently adopted RECLAIM NOx amendments. The catalyst change-outs and subsequent NOx reductions were not scheduled to be implemented until the first quarter of 2020 or later, but will be implemented per the schedule in mitigation measure A-9. While costly, these change-outs were scheduled because they could be implemented without causing any additional major facility shutdowns or outages (which could cause additional emissions). These change-outs would not require additional approvals and would not require major construction and, thus, not add to the already significant construction emissions from the proposed project. Tesoro shall comply with the following mitigation measure:

A-9 Tesoro will implement the following early SCR catalyst change-outs to improve NOx reduction according to the schedule in Table 4.2-14.

TABLE 4.2-14

SCR Catalyst Replacement Schedule

Location	Unit	Completion Date
Carson Operations	Hydrogen Plant #2	Prior to start of construction
Wilmington Operations	HGU-2	Six months following project approval
Carson Operations	Cogen GTG Unit 91, <u>or other GTG Unit with equivalent or greater NOx emission reductions</u>	Nine months following project approval

The stationary source mitigation combined with the construction mitigation measures reduces the duration of significant NOx emissions to the first 20 months of construction. Implementation of the SCR catalyst change-outs identified in Mitigation Measure A-9 is expected to reduce NOx emissions from the units listed above from 40,000 to 49,000 lbs/yr compared to recent (2015) levels, once all three change-outs have been completed.

<u>Other Mitigation Measures</u>

During the course of construction, process units with combustion sources will be shutdown to accomplish the project modifications. Therefore, varying temporary emission reductions will occur. Emission reductions will vary depending on the number of units that are shutdown concurrently. Therefore, while the reductions are quantifiable, the emission reductions do not directly offset peak construction emissions and will not be accumulated and counted as mitigation emissions reductions. Table 4.2-15 shows the ranges of emission reductions from not operating refinery equipment that are expected to occur during the construction period. Unit shutdowns will vary during the construction period, with a wide range of emission reductions, but as previously indicated, will not be counted as mitigated construction emission reductions. Calculations for deriving the emission effects from equipment shutdowns during construction can be found in Appendix B-1.

Other mitigation measures were considered but were rejected because they would not further mitigate the potential significant impacts. These mitigation measures include: (1) implement a shuttle service to and from retail services during lunch hours (most workers eat lunch on-site and lunch trucks will visit the construction site); (2) use methanol, natural gas, propane or butane powered construction equipment (equipment is not CARB-certified or commercially available); and (3) pave unpaved roads (most Refinery roads are already paved).

TABLE 4.2-15

Emission Reductions from Unit Shutdowns During Construction (lb/day)

Pollutant	Range of Emissions Reduction
CO	50 – 432
NOx	42 – 240
SOx	5 – 255
VOC	19 – 102
PM10	14 – 100

Table 4.2-16 shows the minimum potential mitigated emissions. Since the pool of available Tier 4 equipment is limited, it is not certain that all construction equipment will be available that meets Tier 4 standards. However, Tier 4 off-road equipment will be used when available to mitigate the emissions during construction as required in Mitigation Measure A-7. The calculated mitigated emissions for off-road equipment assume that 50 percent of the construction equipment will be available with Tier 4 emissions-compliant engines and that 50 percent of the trucks associated with the construction will meet the 2010 emissions model year standards. It is expected that a greater percentage will be employed, thus reducing emissions further. The use of Tier 4 equipment and 2010 emissions model year on-road trucks would reduce construction emissions, but VOC and NOx emissions would remain significant. Therefore, during the 90-day transitional period, VOC and NOx emissions would remain significant.

4.2.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Construction emissions for the proposed project for VOC and NOx are expected to remain significant following mitigation. Unmitigated construction emissions of CO, SOx, PM10, and PM2.5 were shown to be less than significant and are expected to remain less than significant following mitigation. Construction emissions are expected to be short-term and they will be eliminated following completion of the construction phase.

Localized air quality significance impacts from construction activities were analyzed for CO, NO_2, PM10, and PM2.5. With implementation of all feasible mitigation measures, construction emissions of NO_2 are expected to remain significant at reduced emission levels. However, the mitigated construction emissions are not expected to reduce the localized air quality impacts to less than significant. Therefore, the construction activities associated with the proposed project are expected to cause significant adverse localized air quality impacts.

TABLE 4.2-16

Tesoro Refinery
Mitigated Peak Construction Emissions[a]
(lb/day)

ACTIVITY	VOC	CO	NOx	SOx	PM10	PM2.5[b]
Total Unmitigated Construction Emissions[c]	106.65	515.54	575.73	1.41	68.55	38.67
Mitigated Construction Emissions						
Construction Equipment	22.31	289.58	247.16	0.76	15.83	12.38
Vehicle Emissions	2.59	76.46	95.44	0.49	29.09	8.18
Fugitive Dust From Construction[d]	--	--	--	--	2.36	0.68
Fugitive Road Dust[d]	--	--	--	--	3.80	0.80
Architectural Coating	62.25	--	--	--	--	--
Stationary Source Mitigation	--	--	-27[e]	--	--	--
Total Emissions[f]	**87.15**	**366.04**	**315.60**	**1.25**	**51.08**	**22.04**
SCAQMD Threshold Level	75	550	100	150	150	55
Significant?	**Yes**	**No**	**Yes**	**No**	**No**	**No**

(a) Peak mitigated emissions for VOC predicted to occur in Month 25. Peak CO, NOx, SOx, PM10, and PM2.5 predicted to occur during Month 13.
(b) PM2.5 is determined using SCAQMD, 2006.
(c) From Table 4.2-2
(d) Assumes application of water three times per day.
(e) Minimum emissions reduction expected during the peak construction month. Actual reductions may be greater. In subsequent months additional NOx emission reductions will be implemented up to 109 lb/day by Month 19.
(f) The emissions in the table may differ slightly from those in Appendix B-1 due to rounding.

The potential for high concentration of CO emissions associated with truck/vehicle traffic was considered and evaluated per the requirements of the SCAQMD CEQA Air Quality Handbook (SCAQMD, 1993). The Handbook indicates that any project that could negatively impact levels of service at local intersections may create a CO hot spot and should be evaluated. As evaluated in Section 4.7, no changes in level of service are expected from the proposed project following traffic impact mitigation. Therefore, no significant adverse impacts to ambient air quality due to the traffic impact at intersections in the vicinity of the proposed project are expected.

During the 90-day transitional period, when construction activities are on-going, VOC and NOx emissions will remain significant. Therefore, the 90-day transitional period combined with construction activities associated with the proposed project are expected to cause significant adverse construction air quality impacts and no additional feasible mitigation has been identified that would reduce the localized impacts during construction.

The proposed project is not expected to generate significant adverse CO, NOx, SOx, VOC, PM10, or PM2.5 air quality during operation. Therefore, no mitigation measures are required for operational air quality impacts.

Operational localized air quality impacts from the proposed project were modeled for CO, NO_2, SOx, PM10, and PM2.5 emissions. The analysis demonstrated that the proposed project would not cause or contribute to an exceedance of any ambient air quality standard. Therefore, the operation of the proposed project is not expected to cause a significant adverse impact on ambient air quality and no mitigation measures are required.

The proposed project was analyzed for cancer and non-cancer human health impacts and determined to be less than significant. The estimated cancer risk due to the operation of the proposed project is expected to be less than the SCAQMD's cancer risk significance threshold of 10 in one million. The chronic and acute hazard indices are expected to be below the SCAQMD's chronic and acute hazard indices threshold of 1.0. Therefore, the proposed project is not expected to cause a potentially significant adverse impact associated with exposure to carcinogenic and non-carcinogenic TAC emissions.

4.3 HAZARDS AND HAZARDOUS MATERIALS

The NOP/IS (see Appendix A) determined that the proposed project at the Refinery has the potential to generate significant adverse hazards and hazardous materials impacts. The hazards and hazardous material impacts associated with the proposed project are evaluated in this section. The hazard analysis in Section 4.3 is based on the Worst-Case Consequence Analysis prepared for the proposed project and found in Appendix C.

4.3.1 SIGNIFICANCE CRITERIA

Hazards and hazardous materials impacts would be considered significant if the following occurs:

Non-compliance with any applicable design code or regulation.

Non-conformance to National Fire Protection Association standards.

Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.

Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

Exposure to radiant heat exposures in excess of 1,600 British Thermal Units (Btu)/(hr-ft^2) (the level that creates second degree burns on unprotected skin).

Overpressure exposure that exceeds one pound per square inch (gauge) (psig) (the level that would result in partial demolition of houses)

Flash fire hazard zones that exceed the lower flammable limit (LFL) (the level that would result in a flash fire in the event a flammable vapor cloud was ignited).

4.3.2 ENVIRONMENTAL IMPACTS

4.3.2.1 Process Unit, Storage Tank, and Related Hazards

The major types of public safety risks at the Refinery consist of risks from accidental releases of regulated substances and from major fires and explosions. The discussion of the hazards associated with the existing Refinery and proposed project relies on data in the Worst Case Consequence Analysis for the Tesoro Los Angeles Refinery (see Appendix C). The study has three tasks: (1) Determine the maximum credible potential accidental releases of hazardous materials, and their effects on existing process units, transfer systems, and storage areas; (2) Determine the maximum credible potential accidental releases of hazardous materials, and their consequences, for the modifications to the facility which have been proposed by Tesoro;

and (3) Determine whether the consequences associated with the proposed modifications generate potential hazards impacts that are larger or smaller than the potential hazards which currently exist.

The potential hazards associated with the proposed project are common to most oil processing facilities worldwide, and are a function of the materials being processed, processing systems, procedures used for operating and maintaining the facility, and hazard detection and mitigation systems. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and the process conditions. For hydrocarbon fuel and petrochemical facilities, the common hazards are: toxic gas clouds (e.g., gas with hydrogen sulfide, sulfur dioxide, or sulfur trioxide); flash fires; torch fires; pool fires; BLEVEs; and, vapor cloud explosions.

The endpoint hazard criteria used in this EIR correspond to hazard levels which might cause various types of injuries, depending upon the type of hazard. Table 4.3-1 presents the endpoint hazard criteria used by federal agencies and national associations for this type of analysis and that are used as significance thresholds in this EIR for determining whether or not potential hazard and hazardous materials impacts from the proposed project are significant.

TABLE 4.3-1

Consequence Analysis Hazards and Their Endpoint Hazard Criteria

Hazard Type	Injury Threshold		Reference
	Exposure Duration	Endpoint Hazard Criteria	
Sulfur Dioxide (SO_2) exposure	Up to 60 min	3 ppm	ERPG-2[(a)]
Sulfur Trioxide (SO_3) exposure	Up to 60 min	2.5 ppm	ERPG-2
Hydrogen Sulfide (H_2S) exposure	Up to 60 min	30 ppm	ERPG-2
Radiant heat exposure	40 seconds	1,600 Btu/(hr·ft^2)[(b)]	40 CFR 68[(c)]
Explosion overpressure	Instantaneous	1.0 psig[(d)]	40 CFR 68
Flash fires (flammable vapor clouds)	Instantaneous	Lower Flammable Limit	40 CFR 68

(a) ERPG2: The maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair an individual's ability to take protective action.
(b) Corresponds to second-degree skin burns.
(c) 40 CFR 86 corresponds to U.S. Environmental Protection Agency RMP endpoints.
(d) An overpressure of 1 psi may cause partial demolition of houses, which can result in serious injuries to people, and shattering of glass windows, which may cause skin laceration from flying glass.

In order to determine the hazards from the existing units, proposed new units, and modified units, the CANARY consequence analysis models were used. See Chapter 3.3 and Appendix C for more details on the model and related assumptions. The maximum vulnerability zones (also referred to as hazard zones) for the existing equipment before and after modifications have been made and for proposed new units are presented in Table 4.3-2, which lists the types of potential hazards (fires, thermal radiation, vapor cloud explosion or toxic release) from the new or modified units associated with the proposed project and the results of the modeling for these hazards. The maximum hazard zone identifies the area where the injury significance thresholds would be potentially exceeded in the event of an accidental upset. For each potential hazardous materials release, the distance to the significance threshold level was determined before and after the proposed project modifications (where applicable). For new units, the distance to the threshold level for each release was determined.

Table 4-3-2 shows that the hazard zones for many of the existing units that are part of the proposed project are the same size or larger compared to the hazard zones for these units after modification. New units (e.g., Wet Jet Treater at the Carson Operations; and PSTU, and SARP at the Wilmington Operations) do not have existing hazard zones, so the hazard zones for the proposed new units would represent new hazard zones.

The potential hazard zones from accidental releases originating inside the Carson Operations are dominated by the toxic hazards from the HCU and BLEVE hazard from the LPG Rail Unloading (see Figure 4.3-1). Potential hazard zones from accidental releases at the Wilmington Operation are dominated by toxic hazards in the CRU-3, PSTU, and SARP areas (see Figure 4.3-2).

With the maximum hazard zones defined for each release, the units can be divided into four categories dependent on their potential to create significant adverse off-site impacts to the public. The categories are defined as follows:

- **Units with No Potential Existing and No Post-Project Off-Site Impacts**: The process units that are in this category include the following units at the Carson Operations: Alkylation Unit, 51 Vacuum Unit, Wet Jet Treater; and Mid-Barrel Hydrotreater. The process units that are in this category include the following units at the Wilmington Operations: HTU-1, HTU-2, HTU-4, and modifications to existing crude tanks.

- **Units with Potential Existing and Post-Project Off-Site Impacts, but Post-Project Impacts Are Less Than or Equal to Existing Impacts:** The process units that are in this category at the Carson Operations include the HCU, Naphtha HDS, LHU, and Rail Loading/Unloading area. The process units that are in this category at the Wilmington Operations include the PSTU, CRU-3, and HCU.

- **Units with Potential Existing and Post-Project Off-Site Impacts but No Residential Exposure** (i.e., the post-project area of off-site impact is larger than the existing area of off-site impacts, but remains in industrial areas so that off-site workers in areas adjacent to the Refinery could potentially be exposed): The process units that are in this category at the

Carson Operations include the Naphtha Isomerization Unit and the new crude tanks. The hazards (flash fires) associated with the Interconnecting Pipelines (includes piping within and between the Wilmington and Carson Operations) also are in this category (see Figure 4.3-3) as the off-site impacts would be limited to streets adjacent to the Refinery, but within industrial areas.

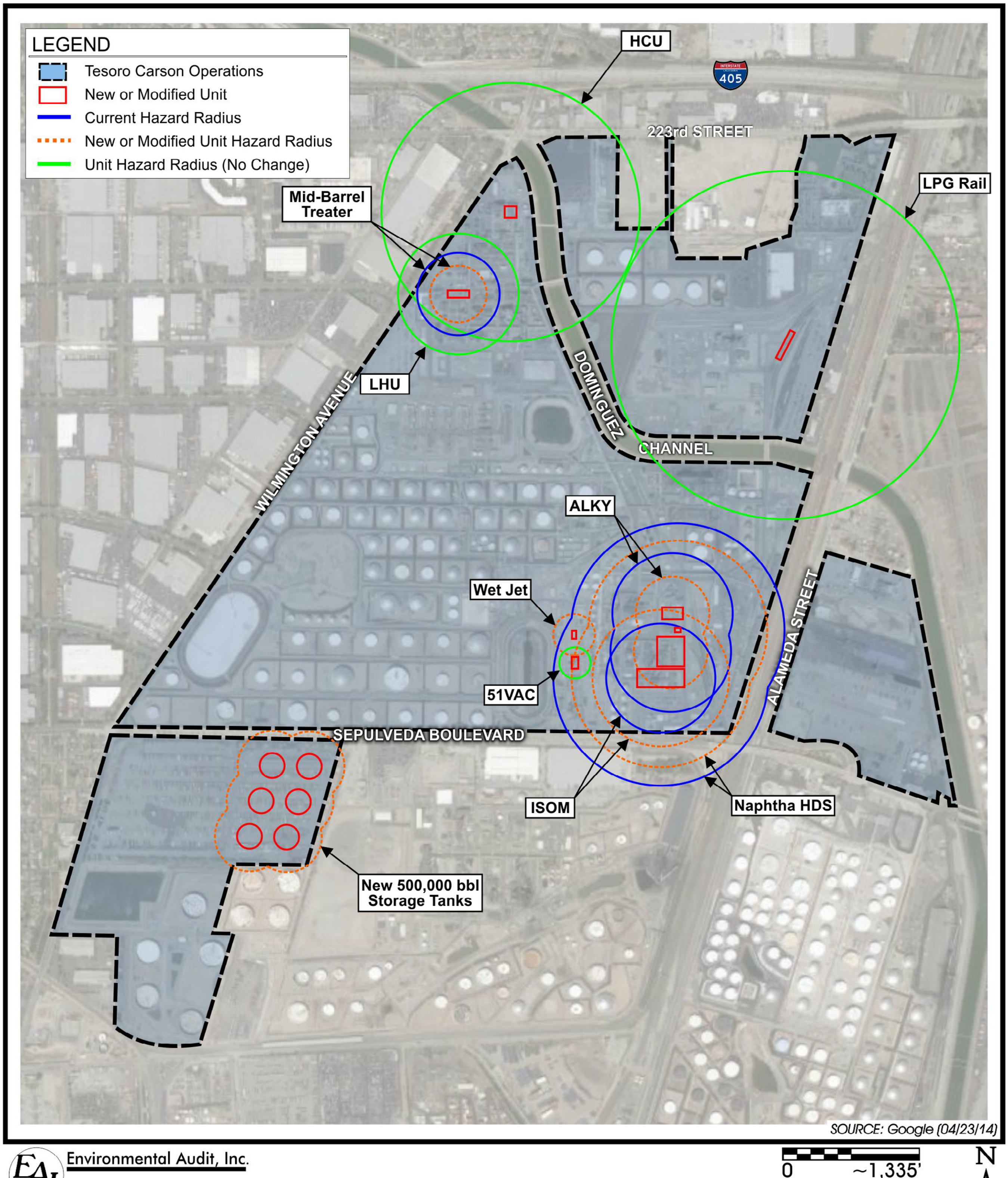
- **New Units with Potential Off-Site Impacts with Potential Residential Exposure:** The modified SARP at the Wilmington Operations is the only proposed project component that falls into this category (see Figure 4.3-2).

TABLE 4.3-2

Maximum Hazard Distance for Maximum Credible Events in Each Process Unit[(a)]

Unit	Injury Threshold	Distance to Hazard (feet)		Hazard (Projected/ Existing)
		Projected	Existing	
Carson Operations				
51 Vacuum Unit	LFL	150	155	Flash Fire
Alkylation Unit	LFL	360	585	Flash Fire
HCU	30 ppm	1245	1250	Toxic (H_2S)
Mid-Barrel Distillate Treater	1,600 Btu/(hr-ft^2)/30 ppm	275	400	Torch Fire/ Toxic (H_2S)
Naphtha HDS	LFL	865	1035	Flash Fire
Naphtha Isomerization	LFL	665	530	Flash Fire*
LHU	LFL	600	585	Flash Fire
Wet Jet Treater	LFL	205	DNCE[(b)]	Flash Fire
New Crude Tanks	1,600 Btu/(hr-ft^2)	340	DNCE	Pool Fire*
Wilmington Operations				
FCCU	Hazards eliminated due to unit shutdown			
HTU-1/2	LFL	1170	1065	Flash Fire
HTU-4	Modifications do not affect hazard zone			
CRU-3	30 ppm	1595	2190	Toxic (H_2S)
PSTU	30 ppm	1085	2190[(c)]	Toxic (H_2S)
HCU	LFL	1320	1450	Flash Fire
SARP	3 ppm	1905	DNCE	Toxic (SO_2)*
Replace Crude Tanks	1,600 Btu/(hr-ft^2)	265	190	Pool Fire
Replace pipeline[(d)]	1,600 Btu/(hr-ft^2)	120	70	Pool Fire
Other				
Interconnecting Pipelines	LFL	380	DNCE	Flash Fire*
LPG Rail Car Unloading	~~1.0 psig~~1,600 Btu/(hr-ft^2)	1,700	1,700	BLEVE Fireball

(a) See Appendix C for further details on the maximum credible events.
(b) DNCE: The hazard does not currently exist.
(c) Existing hazard in the CRU3.
(d) Replace 12-inch pipeline was not the maximum impact for pipelines but has been added for clarity.
* Potentially Significant Hazard Impact

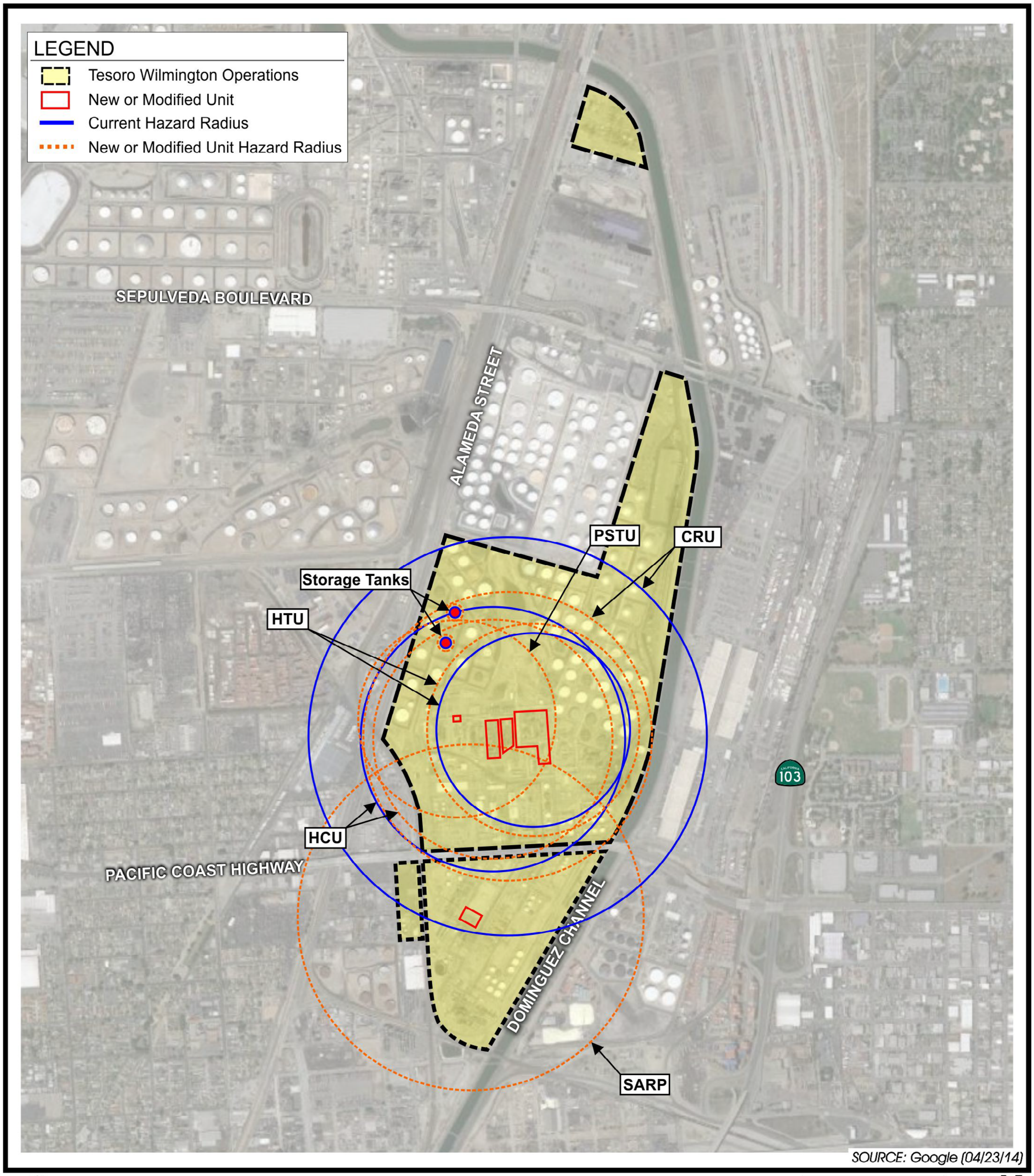


Environmental Audit, Inc.

FIGURE 4.3-1
CARSON OPERATIONS VULNERABILITY ZONES
TESORO LOS ANGELES REFINERY

Project No. 2844

N:\2844\Hazards\Hazards (Carson, rev.3).cdr



Environmental Audit, Inc.

FIGURE 4.3-2
WILMINGTON OPERATIONS VULNERABILITY ZONES
TESORO LOS ANGELES REFINERY

Project No. 2844

N:\2844\Hazards\Hazards (Wilmington, rev.2).cdr

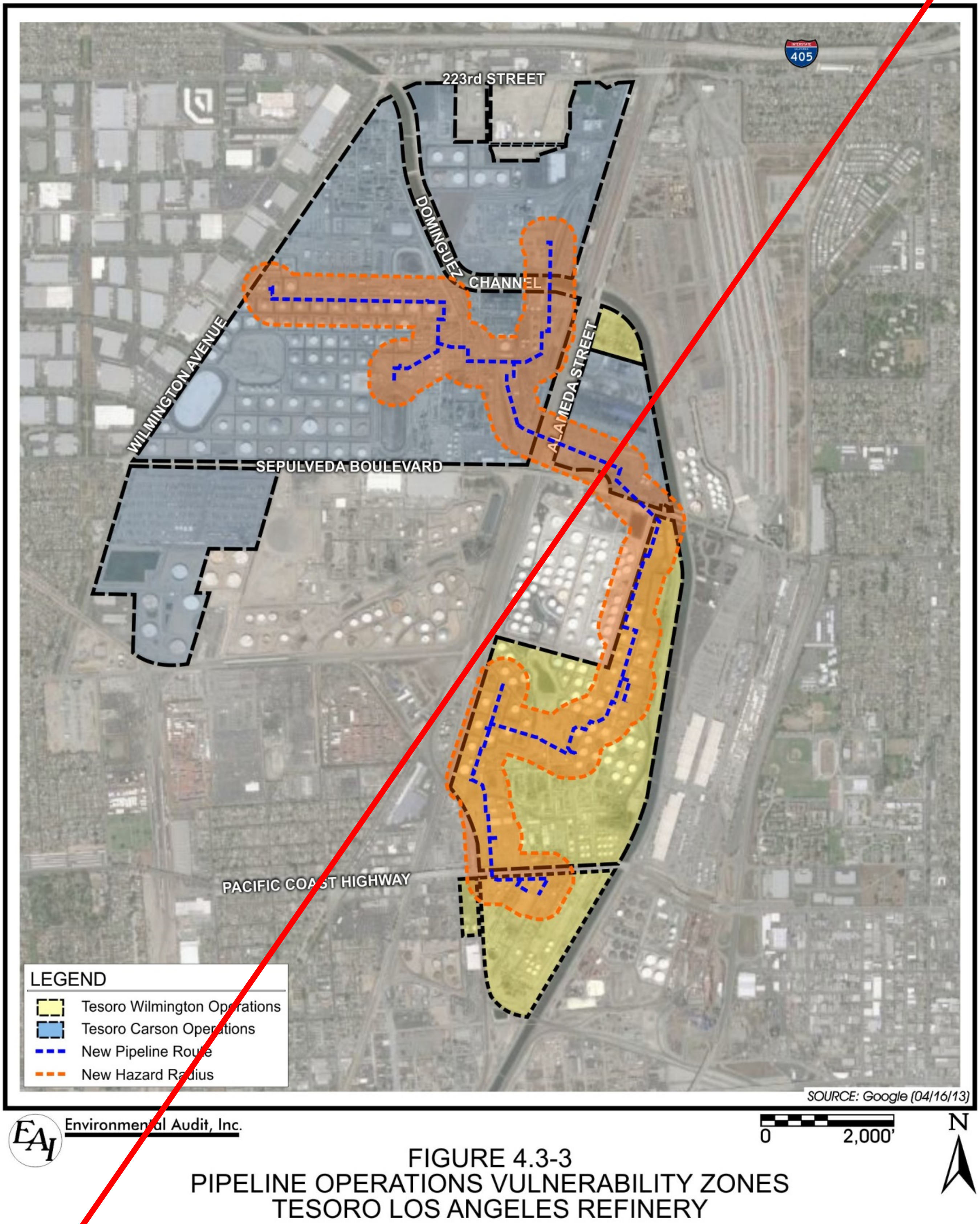


FIGURE 4.3-3
PIPELINE OPERATIONS VULNERABILITY ZONES
TESORO LOS ANGELES REFINERY

Project No. 2844
N:\2844\Hazards\Hazards (Pipeline).cdr

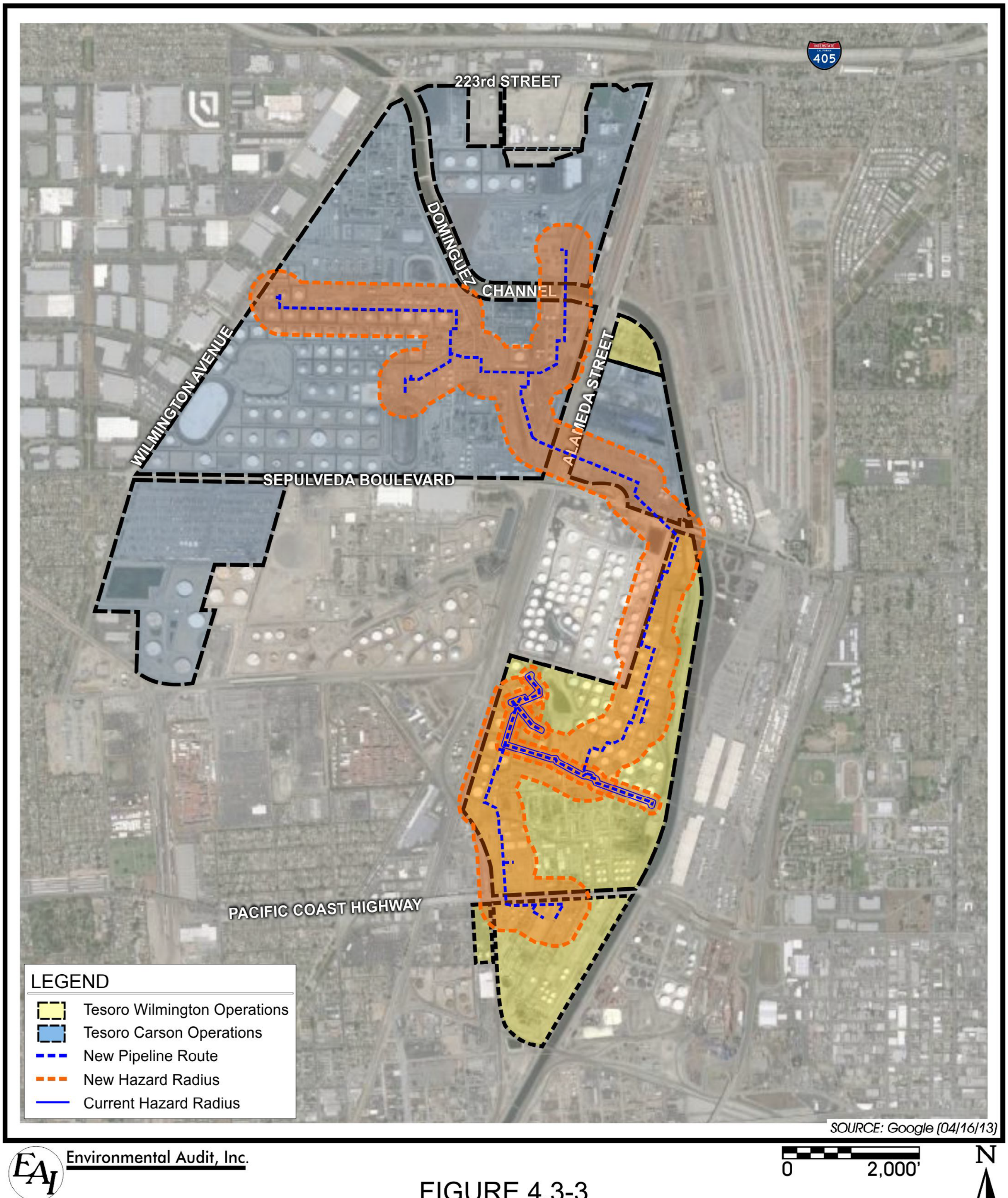


FIGURE 4.3-3
PIPELINE OPERATIONS VULNERABILITY ZONES
TESORO LOS ANGELES REFINERY

Project No. 2844

N:\2844\Hazards\Hazards (Pipeline, rev.1).cdr

Figures 4.3-1 and 4.3-2 identify existing and future maximum hazard zones once the proposed project becomes operational and the off-site areas where the applicable significance thresholds would be potentially exceeded in the event of an accidental upset exposure. The project components that have the potential to generate significant adverse hazard impacts are those that have the potential to result in new off-site exposures to members of the public (i.e., residents, off-site workers, or general public). The new and modified units that have the potential to create a new off-site hazard or extend an existing hazard further off-site to non-residential off-site workers include the Naphtha Isomerization Unit and new crude tanks at the Carson Operations, and the SARP at the Wilmington Operations. The hazards associated with the Interconnecting Pipelines would also extend off-site to non-residential off-site workers as portions of the pipeline are located off-site (see Figure 4.3-3). The hazards associated with the Naphtha Isomerization Unit, new crude tanks, and Interconnecting Pipelines would adversely impact the roadways adjacent to the Refinery (see Figures 4.3-1 and 4.3-2) or other industrial areas (e.g., other refineries, railyards) resulting in new significant hazard exposure to non-residential off-site workers in the event of an accidental release. The hazards associated with the SARP are potentially significant in the event of a worst-case accidental release of sulfur dioxide and could extend up to about 1,905 feet. Although the projected hazard zone would avoid residential areas, several houses are located within nearby industrial areas where the projected sulfur dioxide hazard zone (sulfur dioxide concentrations would exceed the three ppm significance threshold). Tesoro has chosen the optimal location for the SARP, both from an operational standpoint as well as to limit any hazard impacts. The SARP regenerates spent acid from the Alkylation Units; therefore, the optimal location of the SARP is adjacent to the Alkylation Unit at either Carson or Wilmington Operations. This will limit additional potential hazards associated with longer acid piping runs through the Refinery. There is no plot space available near the Carson Operations Alkylation Unit for the SARP, however there is sufficient plot space next to the Wilmington Operations Alkylation Unit. The Wilmington Operations Alkylation Unit is also adjacent to the Wilmington Operations Boiler House. Locating the SARP by the Wilmington Operations Alkylation Unit and Boiler House ensures availability of necessary utilities for the SARP operations. As a result, the proposed project has the potential to create significant adverse hazard impacts to residents in the event of a worst-case accidental release. Therefore, the hazard impacts associated with the proposed project are concluded to be potentially significant. The details of the analysis are included in Appendix C.

The above hazards analysis takes a worst-case approach by assuming that the entire contents of a tank or other equipment would rapidly be released and that no safety measures are implemented that could reduce the severity of an accidental release. It should be noted that existing maintenance inspections and extensive safety measures and training would likely reduce the probability and severity of a catastrophic or hazardous event. In addition, in 2012 subsequent to the Chevron Richmond Refinery fire, the Governor formed an Interagency Working Group to improve public and worker safety state-wide to minimize events and improve interagency coordination of response activities during an event (Interagency Working Group on Refinery Safety, 2014). Based on the analysis of potential hazard impacts, which uses worst-case assumptions, the consequences of a hazardous materials release would be the same irrespective of the cause of the release (e.g., human error, equipment failure, sabotage, terrorism, natural disaster, or civil uprising). Since operation of the proposed project will not introduce the use of new flammable substances or hazardous materials that are not currently used at the Refinery, no new sources of accidental releases of new hazardous materials would be present at the Refinery. The proposed project includes modifications to existing units and new units that will be connected to vapor recovery and safety flare systems. Additional flaring from normal operations is prohibited by Rule 1118. The project is not expected to increase flaring at the Refinery. There will be no routine vents to the flare system or the flare gas recovery systems from any of the modifications. While the number of pressure relief valves tied in to the flare systems will increase with installation of new or modified process units, this will not cause an increase in flaring. There will, however, be additional potential vent sources to the flare gas recovery and flare systems during unit upsets or emergencies.

Secondary effects, such as ash fallout from a fire, may occur as a result of a potential hazard. These effects are incident specific and would vary depending on the type of hazard, chemicals involved, and ambient conditions at the time of the incident. Therefore, these secondary effects are considered speculative and are not analyzed.

4.3.2.2 Regulatory Compliance

The proposed project modifications must comply with various regulations, including state and federal OSHA regulations, as well as regulations that regulate the handling of toxic, flammable, reactive, and explosive materials, as discussed below.

The proposed project will make modifications to existing Operations that are expected to be adequately served by the existing fire-fighting capabilities. Section 3.3.6 describes the existing fire-fighting capabilities. New tanks will be equipped with fixed foam systems in compliance with current regulations.

Section 112 (r) of the Clean Air Act Amendments of 1990 [42 U.S.C. 7401 et. seq.] and Article 2, Chapter 6.95 of the California Health and Safety Code require facilities that handle listed regulated substances to develop RMPs to prevent accidental releases of these substances. The Refinery has prepared an RMP for the existing Refinery which may need to be revised to incorporate the changes associated with the proposed project.

Under federal OSHA, regulations have been promulgated that require the preparation and implementation of a Process Safety Management (PSM) Program (29 CFR Part 1910, Section 119, and Title 8 of the California Code of Regulations, Section 5189). A PSM Program that meets the requirements of the regulations will prevent or minimize the consequences of a release involving a toxic, reactive, flammable, or explosive chemical and their potential impacts on workers and the surrounding community. A PSM review for the new and modified equipment would be required as part of the proposed project. The primary components of a PSM include the following:

- Compilation of written process safety information to enable the employer and employees to identify and understand the hazards posed by the process;
- Performance of a process safety analysis to determine and evaluate the hazard of the process being analyzed;

- Development of operating procedures that provide clear instructions for safely conducting activities involved in each process identified for analysis;
- Training in the overview of the process and in the operating procedures for facility personnel and contractors. The training would emphasize the specific safety and health hazards, procedures, and safe practices; and,
- A pre-start up safety review for new facilities and for modified facilities where a change is made in the process safety information.

The Refinery will comply with all the above-listed regulations, conform to National Fire Protection Association standards, and to any other applicable safety regulations such as the federal Hazardous Material Transportation Act, which regulates transportation of hazardous materials. For a comprehensive discussion of other potentially applicable federal, state, and local hazardous materials regulations the Refinery may need to comply with, see Section 3.3.6 of this EIR. Therefore, no significant adverse regulatory compliance impacts are expected.

4.3.2.3 Pipeline Hazards

Pipeline Rupture/Fires: The new Interconnecting Pipelines bundle will contain multiple pipelines that are expected to transport gasoline and gasoline blending components, gas oil, crude oil, butylene, propylene, and LPG between the Carson and Wilmington Operations, thus, achieving the project objective of further integrating the operations into one Refinery. As discussed in Section 4.3.2.1, the potential worst-case hazard associated with the new Interconnecting Pipelines would be a flash fire from an above ground pipeline that could extend up to approximately 380 feet (see Table 4.3-2 and Figure 4.3-3). Land use in the vicinity of the Interconnecting Pipelines is heavy industrial and most of the new Interconnecting Pipelines would be within the confines of the Refinery, except where it crosses under Sepulveda Boulevard and Alameda Street. The closest residential land uses to the proposed new pipelines would be approximately one-half mile away (residential area east of the Refinery in Long Beach). The maximum hazard zone for any of the pipelines would be 380 feet and would not extend to the residential areas. It should also be noted that existing pipelines are located in the same corridor as the proposed pipelines and have existing hazards of approximately the same magnitude as the proposed pipelines as the existing pipelines convey similar materials at similar operating temperatures and pressures. Therefore, the largest potential hazards associated with the proposed pipelines are essentially the same as existing pipelines.

The proposed Interconnecting Pipelines associated with the proposed project would be underground off-site (i.e., approximately 80 feet under Alameda Street and Sepulveda Boulevard). Therefore, the potential for a fire in the off-site pipelines would be unlikely due to the depth of the pipeline and the lack of air needed to initiate combustion. In addition, the proposed Interconnecting Pipelines will include heavy-wall pipe with extra corrosion allowance, cathodic protection installed on all lines, and all lines will have a fusion bond epoxy coating with abrasion resistant coating. Further, because the proposed project does not include making any equipment modifications (such as, change in metallurgy in the crude units) that would allow the Refinery to receive crude oils that cannot be blended to the same API gravity, sulfur content and other parameters such as TAN that it currently receives, the proposed project is not expected to result in pipeline transport of petroleum products with a higher corrosivity than is currently transported by the Refinery through existing pipelines (see Subsection 2.5.4.2 for additional information on crude oil blends that can be received by the Refinery). Isolation valves will be installed on both ends of the lines with flow meters to monitor for flow discrepancies and activate isolation valves if necessary. Equipment that would allow early detection of anomalies in the lines would also be included as part of the interconnecting pipeline. Therefore, an underground pipeline failure of one pipeline is not expected to contribute to a failure of another pipeline.

For the above ground portions of the Interconnecting Pipelines, a fire involving one pipeline could radiate heat to other adjacent above-ground pipelines that are near the pipeline that is producing the fire. Refinery equipment and piping is designed using stringent design codes. For the facility process piping, it is American Society of Mechanical Engineers (ASME) B31.3. While not specifically designed for an external fire, under this code, piping is designed to withstand various design temperatures and pressures and has safety factors such as corrosion allowance that give it additional strength. The melting point for the carbon steel material used per B31.3 is approximately 2600 deg F. If the adjacent pipelines are operating, heat would be transferred to the product in the pipeline, but the heat would dissipate as the product travels through the pipeline away from the vicinity of the fire, reducing the potential for a release from another pipeline failure. If the adjacent pipeline was not operating, there would be no product in the pipeline so that an accidental release in the adjacent pipeline could not occur. The pipelines that would be above ground would be limited to the Refinery property and fires impacts would be limited to the Refinery property. Therefore, the potential hazard impacts associated with the proposed Interconnecting Pipelines are expected to occur primarily on the Refinery properties or off-site industrial areas immediately adjacent to those pipelines (see Figure 4.3-3).

Pipeline Releases: In addition to flash fires, hazards associated with pipelines could include accidental releases of the material that they transport (e.g., gasoline blending components, gas oil, crude oil, butylene, propylene and LPG) to the environment. In the event that the pipeline leak is not detected promptly, potential impacts associated with a pipeline leak would generally be contamination of the local soils and, depending on the geology of the accident site, potential contamination of local ground water (see Subsection 4.3.2.4). Because comprehensive corrosion protection and leak detection measures required by the Department of Transportation (DOT) (see Pipeline Regulations below) would be required and are included as part of proposed Interconnecting Pipelines, the potential for a leak to go undetected is expected to be minimal. As explained below, a number of laws, rules, and regulations are in place that apply to both new and existing pipelines that minimize the potential for accidental pipeline releases. As explained in the following paragraphs, the proposed project will comply with all applicable pipeline regulations.

Pipeline Regulations: The U.S. DOT Pipeline and Hazardous Materials Safety Administration (PHMSA) compiles pipeline incidents statistics, which identify the major causes of leakage or rupture including: (1) corrosion; (2) third party excavation; (3) damage by natural events (e.g., a seismic event); and, (4) equipment failure. New pipelines are less likely to leak or rupture than old pipelines due to increased regulatory requirements such as use of state-of-the-art in-field inspection techniques and corrosion protection as explained in the following paragraphs.

New pipelines are subject to comprehensive regulation including requirements for pre-operational testing to ensure the operational integrity of the pipeline. (See the discussion of regulatory standards in Section 3.3.7.1.5.) Hydrostatic testing to 125 percent of the operating pressure is required by the State Fire Marshal prior to operation of a pipeline. Additional periodic testing is required for pipelines, with the frequency of testing based on pipeline age, use of cathodic protection, and release history. New pipelines are required to accommodate instrumented internal inspection devices (commonly referred to as “smart pigs”). “Smart pigs” detect where corrosion or other damage has affected the wall thickness or shape. Additionally, to ensure the pipeline is operating properly and the total volume of material shipped is received, monitoring of operations during transfer of material is required and may include pressure indicators along the pipeline route, as well as flow meters at both the shipping and receiving ends of the pipeline. Underground interconnecting piping that will be installed between Wilmington and Carson Operations will employ state of the art corrosion control and leak detection equipment that meets the requirements of the DOT and recommended engineering practices. Leak prevention measures include cathodic protection and corrosion-resistant coatings and/or wrappings for corrosion control. Leak detection measures include flow meters accurate to 0.1% for lines 6” and smaller and 0.15% for the 10” and 12” lines along with automatic isolation valves at both ends of the underground interconnecting pipelines. If flow measurements from the dual meters for any line vary above a specified threshold, transfer pumps will be shut down and the automatic isolation valves will be activated, as appropriate. The line will not be returned to service until the discrepancy is resolved. Management and monitoring systems associated with pipelines allow the rapid identification of a release and immediate shutdown of the pipeline to minimize the impact of a release. Tesoro operators will comply with all applicable regulations, testing, and monitoring requirements. Implementation of these requirements is expected to minimize the probability and severity of potential hazard impacts of any pipeline leaks, should they occur.

A number of federal, state, and local laws have been enacted to regulate the use, storage, transportation, and management of hazardous materials and wastes. Section 3.3.6.1.5 outlines pertinent regulations and agency oversight that direct the use, handling, transportation, storage, and remediation of hazardous materials and wastes, including petroleum products. The Tesoro Los Angeles Refinery complies with these regulations and has numerous programs to ensure its continued compliance with environmental, safety and health requirements. Compliance with such regulations is expected to reduce the frequency and consequences of events resulting in hazardous releases. Although the regulatory requirements imposed on the proposed project pipelines minimize the potential for hazard impacts, the potential adverse off-site pipeline hazard impacts remain and are considered potentially significant.

4.3.2.4 Impacts on Water Quality

An accidental spill of any of the hazardous materials associated with the proposed project (generally petroleum products and by-products from the refining process) used and stored at the Refinery could occur under upset conditions, e.g., earthquake, tank rupture, and tank overflow. Accidental spills or leaks also could occur from undetected corrosion of containers, piping and process equipment, and leaks from seals or gaskets at pumps and flanges. A major earthquake would be a potential cause of a large spill or release. Other causes could include human or mechanical error.

The probability of leaks occurring from the underground Interconnecting Pipelines bundle is low because comprehensive corrosion protection and leak detection measures would be required and are included as part of proposed interconnecting pipeline (see Subsection 4.3.2.3). Further, management and monitoring systems associated with pipelines allow the rapid identification of a release and immediate shutdown of the pipeline to minimize the impact of a release. Therefore, the probability of a leak of hazardous materials from the Interconnecting Pipelines bundle that could adversely affect groundwater is considered to be low.

The Refinery must obtain building permits prior to construction activities. During the issuance of building permits, the Refinery must demonstrate to the local agency (either the City of Los Angeles or Carson) that construction of the vessels and foundations would be in accordance with the California Building Code requirements. Compliance with the California Building Code helps structures to resist major earthquakes without collapse, but could result in some structural and non-structural damage following a major earthquake. Further, the Refinery performs foundation inspections after major earthquakes and makes any necessary repairs. Foundation inspections would continue to occur after major earthquakes once the proposed project becomes operational.

Spills at the Refinery facilities would generally be collected within containment facilities for storage tanks and loading and unloading equipment, including the equipment modified as part of the proposed project. The Refinery has emergency spill containment equipment and would implement spill control measures in the event of an accidental release of hazardous caused, for example, by human error, equipment failure, sabotage, terrorism, natural disaster (e.g., earthquake), or civil uprising. Storage tanks and loading and unloading equipment have secondary containment capable of containing 110 percent of the contents of the storage tanks. Therefore, the rupture of a tank would be collected within the containment system and pumped to an appropriate storage tank as soon as possible. Containment facilities would be required for new equipment.

No surface water runoff occurs from the Refinery site. Therefore, large spills outside of containment areas at the Refinery are expected to be captured by the Refinery grading and drainage system, where it would be controlled. Spilled material would be collected and pumped to an appropriate tank, or sent off-site if the materials cannot be used on-site. Because of the containment and drainage systems, spills are not expected to migrate from the facility off-site or in to any water systems; therefore, potential adverse water quality hazard impacts are considered to be less than significant.

4.3.2.5 Transportation Hazards

The transportation of hazardous materials can result in off-site releases through accidents or equipment failure. The materials currently transported to and from the Refinery include crude oil, gas oil, gasoline, diesel, LPG, sulfur, oxygen, fresh and spent sulfuric acid, fresh and spent caustic, and ammonia.

The transportation of hazardous substances poses a potential for fires, explosions, and other hazardous materials releases. In general, the greater the miles traveled, the greater the potential for a release during transport of hazardous substances. Statistical accident frequency varies, and is related to the relative accident potential for the travel route since some routes of travel are safer than others. The size of a potential release is related to the maximum volume of a hazardous substance that can be released in a single accident, should an accident occur, and the type of failure of the containment structure, e.g., rupture, leak, or BLEVE. The potential consequences of the accident are related to the size of the release, the population density at the location of the accident, the specific release scenario, the physical and chemical properties of the hazardous material, and the local meteorological conditions.

The factors that enter into accident statistics include distance traveled and type of vehicle or transportation system. A common reference frequently used in measuring risk of an accident is the number of accidents per million miles traveled. Complicating the assessment of risk is the fact that some accidents can cause significant damage without injury or fatality. Therefore, to be conservative, the significance determination is based on consequence alone and information on frequency (i.e., miles traveled) is to provide context and disclosure and is not relied upon.

Every time hazardous materials are moved from the site of generation, there are opportunities for accidental (unintentional) releases. The U.S. DOT conducted a study on the comparative risks of hazardous materials and non-hazardous materials truck shipment accidents (i.e., involved in a collision) and incidents (i.e., not involved in a collision). The Federal Motor Carrier Safety Administration (FMCSA) compared risks of hazardous materials truck shipment accidents and incidents to non-hazardous materials truck shipment accidents and incidents (FMCSA, 2001). The estimated accident rate for trucks (shipping non-hazardous materials) was 0.73 per million miles traveled. The average accident rate for trucks transporting hazardous materials (all hazard classes) was estimated to be 0.32 per million miles traveled (FMCSA, 2001). Since not all hazardous materials transport accidents involve releases, the average accident rate for trucks carrying corrosive materials involving a release (hazard class 8), such as sulfuric acid or fresh/spent caustic, was estimated to be 0.04 per million miles traveled (73/1,900,000,000) (FMCSA, 2001). A similar analysis of rail transport based on data from the U.S. DOT Bureau of Transportation Statistics (BTS, 2015) and the Pipeline and Hazardous Materials Safety Administration (PHMSA, 2015) estimates an average serious Hazard Material Information System (HMIS) incident rate of 0.08 per million miles traveled (17/221,820,000) for spent caustic and 0.03 per million miles traveled (9/331,090,000) for LPG. The accidents and incident rates are inclusive of all hazard situation (fire, explosion, release, BLEVE, etc.) that may occur, therefore, covers the risks scenarios ranging from small leaks to fatalities.

4.3.2.5.1 Truck Transport

The proposed project would result in a decrease in the transportation of spent sulfuric acid. Currently, spent sulfuric acid from the Carson Alkylation Unit is transported via pipeline to the ECO Services Dominguez Carson facility (located at 20720 South Wilmington Avenue, Carson, California, approximately one mile north of the Carson Operations) for recycling. Following completion of the SARP, spent sulfuric acid would be transported via truck to the SARP at the Wilmington Operations, a distance of about 1.9 miles. Spent sulfuric acid from the Wilmington

Alkylation Unit is currently transported via truck to the ECO Services Dominguez Carson facility for recycling, a distance of approximately 5.55 miles. Following completion of the SARP, spent sulfuric acid from Wilmington Operations would be treated on-site so that the transportation of spent sulfuric acid from Wilmington Operations would be eliminated. As shown in Table 4.3-3, the proposed project is expected to result in a decrease in the number of total vehicle miles traveled to transport spent acid, reducing overall truck transport~~ and the related hazards~~. Because spent acid is currently transported by truck, the consequences of an accidental release would not change, and, t~~T~~herefore, the potential hazards associated with transporting sulfuric acid are considered to be less than significant.

TABLE 4.3-3

Proposed Project Impacts on Sulfuric Acid Transport

Parameter	Baseline 2012/2013 Average	Estimated Use Proposed Project
Wilmington Operations		
Spent Acid Generated (tons/yr)	52,984	52,984
Trucks to transport of Spent Acid (trucks/yr)[(a)]	2,119	2,119
Distance from Wilmington to the ECO Services Dominguez (miles)	5.55	NA
Total Truck Transport of Spent Acid (miles/yr)	11,762	0
Carson Operations		
Spent Acid Generated (tons/yr)	70,353	70,353
Trucks to transport of Spent Acid (trucks/yr)	2,814	2,814
Distance from Carson to Wilmington Operations (miles)[(b)]	NA	1.92
Total Truck Transport of Spent Acid (miles/yr)	0	5,403
Refinery Post Project Estimates		
Truck Transport of Spent Acid Post Project (Proposed Project –Baseline) (miles/yr)		-6,359

(a) Truck capacity is approximately 25 tons of acid per truck.
(b) 1.92 miles

The proposed project is expected to increase the shipment of caustic by truck. Fresh and spent caustic is currently shipped to the Refinery via truck. The Refinery currently uses over two million gallons (50,000 barrels) of caustic per year in various Refinery processes and transports approximately 300,000 gallons (7,000 barrels) of spent caustic per year. Spent caustic is first transported via truck to the Ventura Trucking facility (located just east of the Tesoro administration building on 223rd Street) where it is loaded onto rail for transport to the Gulf Coast for regeneration. The remaining spent caustic is recycled or processed internally in the Refinery and then discharged with treated wastewater.

The proposed project will result in an increase in the transport of fresh caustic of up to three trucks per day to the Carson Operations and the Wilmington Operations. Caustic will be used primarily in the Wet Jet Treater at Carson and also in air pollution control equipment (wet gas scrubber) proposed at the SARP at the Wilmington Operations. The proposed project is expected to generate approximately 110,880 gallons (2,640 barrels) of spent caustic per week so that approximately 10 truck trips per week will be required with up to three truck trips per day of five miles each. Trucks will transport spent caustic from the Wet Jet Treater and SARP units to the Ventura Trucking facility. The spent caustic transported to the Ventura Trucking facility will be loaded onto railcars for transport to the Gulf Coast for regeneration.

As discussed above, the fresh and spent caustic trucks from the proposed project are expected to deliver the caustic materials locally, and travel a maximum of 45 miles per day (over 6 deliveries). Using the maximum estimated truck trips of 45 miles per day, the potential for an accident involving a caustic truck is 0.000002 (45 miles per day / 1 million miles x 0.04 accidents/million miles driven) or approximately one accident every 555,556 years. Though it is difficult to compare hazardous and non-hazardous transport risk, the differences appear to be significant enough to conclude that the number of non-hazardous transport accidents dominates highway transport risk. The specific hazardous material trucking regulations and additional care provided by carriers and shippers of hazardous materials appear to be reducing the accident rate for hazardous material shipments (FMCSA, 2001).

The County of Los Angeles has developed criteria to determine the safest transportation routes. Some of the factors which need to be considered when determining the safest direct routes include traffic volume, vehicle type, road capacity, pavement conditions, emergency response capabilities, spill records, adjacent land use, and population density. In managing the risk involved in the transportation of hazardous materials, all these factors must be considered.

The actual occurrence of an accidental release of a hazardous material associated with a traffic accident cannot be predicted. The location of an accident or whether sensitive populations would be present in the immediate vicinity also cannot be identified. In general, the shortest and most direct route that takes the least amount of time would have the least risk of an accident. Hazardous material transporters do not routinely avoid populated areas along their routes, although they generally use approved truck routes that take population densities and residential areas into account. ~~Because spent caustic is currently transported by truck, the consequences of an accidental release would not change.~~ The likelihood that an accident involving a hazardous truck transport would occur is once every 555,556 years. Therefore, the probability for an adverse impact from truck transport of hazardous materials is extremely low. Because spent caustic is currently transported by truck, the consequences of an accidental release would not change. ~~A~~and, therefore, the potential hazard impact related to truck transport from the proposed project is less than significant.

In addition, annual transport of additional coke produced as a result of the potential increase in crude oil processed in the DCU H-100 heater is expected to increase. However, coke is not considered a hazardous material. Therefore, no increase in hazardous material transport is associated with coke transport.

4.3.2.5.2 Rail Transport

The proposed project is expected to increase the shipment of caustic by rail using rail cars specifically designed for the transport of caustic. As previously discussed, the proposed project is expected to generate approximately 110,880 gallons (2,640 barrels) of spent caustic per week.

The spent caustic will be transported to the Ventura Trucking facility by truck before it will be loaded onto railcars for transport to the Gulf Coast for regeneration. Therefore, the proposed project will add about four railcars per week of spent caustic acid to existing trains that are currently transporting spent caustic from the Refinery. Using the maximum estimated travel to the state line of 277 miles per railcar for four railcars, the potential for a serious HMIS incident involving a caustic railcar is 0.00007 (1110 miles per day / 1 million miles x 0.08 accidents/million railcar miles) or approximately one accident every 11,760 years.

The proposed project is also expected to increase the number of LPG railcars by a maximum of 10 per day. The LPG will be transported in railcars specifically designed to transport LPG and stored within existing storage tanks at the Carson and Wilmington Operations. LPG can originate from a number of locations including Northern and Central California; Lynndyl, Utah; Bumstead, Arizona; and Hutchinson or Conway, Kansas. The longest route within California starts in Martinez and arrives at the Refinery via Barstow, and is approximately 605 miles. These additional LPG railcars will be added to existing rail shipments. Using the maximum estimated trips travel of 605 miles per day per railcar for 10 railcars, the potential for a serious HMIS incident involving a LPG railcar is 0.0002 (6,050 miles per day / 1 million railcar miles x 0.03 accidents/million miles) or approximately one accident every 6,081 years.

The likelihood that an accident involving a hazardous rail transport would occur is once every 11,760 years for spent caustic and 6,050 years for LPG. ~~Because spent caustic and LPG are currently transported by rail, the consequences of an accidental release of either material would not change.~~ Therefore, the probability for an adverse impact from rail transport of hazardous materials is extremely low. Because spent caustic and LPG are currently transported by rail, the consequences of an accidental release of either material would not change and, therefore, the potential hazard impact related to rail transport from the proposed project is less than significant.

The existing hazards associated with loading/unloading LPG are shown on Figure 4.3-1. The proposed project would not introduce any additional hazards associated with the loading/unloading of LPG as there would be no modifications to the existing storage facilities or loading and unloading facilities; there would only be an increased throughput of LPG through the existing facilities. Therefore, the proposed project would not change the magnitude of the existing hazard zone shown in Figure 4.3-1 because all of the equipment associated with rail loading, delivery, and storage would remain unchanged.

4.3.2.6 Hazard Impacts During Construction

The Carson Operations and Wilmington Operations are known to have groundwater and soil contamination that have been and will continue to be remediated and managed under RWQCB oversight. Extensive soil and groundwater investigations have been conducted at the site with the oversight of the RWQCB as discussed in Subsections ~~3.3.4.1~~ 3.3.5.1 and ~~3.3.4.2~~ 3.3.5.2 in Chapter 3 of this EIR.

The construction phase of the proposed project will require construction workers to excavate soil across the Wilmington Operations, primarily the southeastern portion of the Carson Operations, and the Carson Crude Terminal, where construction of the new crude storage tanks will occur.

Therefore, construction workers could encounter contaminated soils and groundwater during site excavation. Generally, a hazards analysis focuses on impacts to off-site receptors because they are unlikely to have undergone safety training or have safety equipment available in the event of a hazard event. On-site workers are provided with protection against many types of hazard impacts as a result of having access to safety equipment, participating in safety exercises, and undergoing profession training to safely work around the potentially hazardous conditions that exist within a refinery. Further, extensive rules, regulations, laws, and other requirements are in place, specifically designed to ensure a safe working environment for industrial workers, including refinery workers and construction workers. The following analysis of potential hazard impacts during construction identifies potential hazards during construction and whether such hazards could pose significant risks to off-site receptors. Effects of any construction hazards identified will also be evaluated for construction workers.

All excavated soil will be handled per Tesoro's Los Angeles Refinery Management Plan for Excavated Soil. This plan details Tesoro's process for soil handling, excavation planning and soil management, and compliance with SCAQMD's Rule 1166 VOC Monitoring and fugitive-dust controls. The Management Plan for Excavated Soil will be followed prior to and during the excavation of soil within the Tesoro Wilmington and Carson Operations property boundaries, consistent with any Tesoro excavation projects. Existing site characterization data showing contaminated soil sites will be supplemented with sample data from pre-project exploratory borings conducted throughout the construction zone to develop a project-specific Soil Management Plan.

As part of the design of the proposed project, soil samples have been collected in areas of the Refinery where construction is to take place to characterize the soil for disposal purposes (i.e., hazardous or non-hazardous waste designation) and to provide data to assess the potential of exposure to contaminated soil and groundwater (Trihydro, 2015). The samples indicate that of soil to be potentially excavated, with the exception of soil in the location of the six new crude tanks, approximately 95 percent of the excavated soil will be classified as non-hazardous waste (see Table 4.6-1, which shows the total volume of soil excavated and the volumes of the total that would be classified pursuant to 40 CFR 260 and 22 CCR Title 9 as hazardous or non-hazardous wastes). During the soil sampling activities, air sampling consistent with SCAQMD Rule 1166 guidance was performed. The air sampling results indicate that in areas within the Refinery where excavation is expected to be less than 20 feet, VOC concentrations are expected to be less than the 50 ppm limit that requires special soil handling procedures to be implemented, with the exception of two areas. Two areas have the potential for shallow soil contamination with VOC concentrations in excess of the Rule 1166 50 ppm limit.

The first exception area where air samples exceeded 50 ppm is a portion of the area where the six new crude tanks are to be installed, which was the location of a former oil reservoir. The soil in this area is potentially impacted with heavy hydrocarbons with small concentrations of light hydrocarbons (e.g., benzene, toluene, ethylbenzene, xylenes) with the local depth to groundwater around 45 feet (ThermoRetec, 2001). The nearest resident to the proposed six new crude storage tanks is approximately 1,300 feet west of the Refinery. However, with low concentrations of light hydrocarbons, it is not expected that the Rule 1166 50 ppm limit will be exceeded at the nearest residential areas because the hydrocarbon gases will be substantially diluted as they travel 1,300 feet. Pursuant to applicable worker safety laws (which are outlined in the bullet points below) workers in this area will be required to wear personal protection equipment such as gloves, coveralls, boots, hard hats, etc. and if deemed necessary by monitoring, respiratory protection (see the discussion under Health and Safety Plans below). Workers will also be required to handle contaminated soil in accordance with a variety of safety procedures including the Resources Conservation and Recovery Act and Hazardous Waste Control Law (see the summary of those requirements in the bullet points below).

The second exception where air samples exceeded 50 ppm is the area along the pipeline route in the central portion of the Wilmington Operations. The Rule 1166 monitoring performed during soil sampling activities measured a 364.1 ppm concentration of VOC emissions, which exceeds the Rule 1166 50 ppm limit that requires special handling procedures. The monitoring showed that the potential to generate hydrocarbon emissions from soil excavation during construction is expected to be limited to the area along the pipeline route in the central portion of the Wilmington Operations. The nearest resident to the pipeline construction area in the central portion of the Wilmington Operations is approximately 2,000 feet to the west. It is expected that dilution of the hydrocarbon gases over distance will result in hydrocarbon concentrations much less than the Rule 1166 50 ppm limit at the nearest residential receptors. Construction workers that work in this area will be required to wear personal protection equipment such as respirators, gloves, coveralls, boots, hard hats, etc. (see the discussion under Health and Safety Plans below). Workers will also be required to handle contaminated soil in accordance with a variety of safety procedures including the Resources Conservation and Recovery Act and Hazardous Waste Control Law (see the summary of those requirements in the bullet points below).

The total depth of excavations necessary to install the foundations for the proposed project components are expected to be four feet deep with pilings drilled to approximately 30 feet. While groundwater is not expected to be encountered during excavations for foundations, it is possible that contaminated groundwater may be encountered during construction of pilings. Pilings would be required to support all new units and major pieces of equipment, e.g., Wet Jet Treater, SARP, and storage tanks. During the installation of pilings, if contaminated groundwater is encountered, it would be handled in accordance with Refinery operating procedures to collect the fluid in a sealed container and process the collected fluid in the on-site wastewater treatment plant. Construction workers that may encounter contaminated water are required by applicable laws to wear personal protection equipment such as respirators, gloves, coveralls, boots, hard hats, etc. (see the discussion under Health and Safety Plans below). Workers will also be required to handle contaminated soil in accordance with a variety of safety procedures including the Resources Conservation and Recovery Act and Hazardous Waste Control Law (see the summary of those requirements in the bullet points below).

Construction workers at the Refinery and other locations are protected by numerous existing rules, regulations and requirements and have been professionally trained to safely work around the potentially hazardous conditions that exist within a refinery. The Tesoro Refinery complies with existing laws and regulations that address the discovery and remediation of contaminated sites, including the discovery of such sites during construction activities. The Refinery complies with existing laws that require health and safety plans, worker training, and various other activities which serve to protect workers from exposure to contamination and are summarized below. Compliance with these laws will ensure that any off-site receptor or worker exposure is less than significant. The principle laws relative to worker safety are summarized in the following bullet points.

- **Hazardous Waste Operations and Emergency Response Standard (HAZWOPER, Fed-OSHA, 29 CFR 1910.120):** The HAZWOPER Standard applies to employees who are exposed or potentially exposed to hazardous substances, including hazardous waste, and who are engaged in clean-up operations. Facilities that use, store, manufacture, handle, process, or move hazardous materials (including remediation operations) are required to conduct employee safety training, have available and know how to use safety equipment, prepare illness prevention programs, provide hazardous substance exposure warnings, prepare emergency response plans, and prepare a fire prevention plan (29 CFR Part 1910). In California, Cal-OSHA assumes primary responsibility for enforcing workplace safety regulations (Cal-OSHA, HAZWOPER, 8 CCR 5192).

- **Cal-OSHA:** Safety requirements to protect employees, including construction workers, from potential exposure to hazardous substances are enforced by Cal-OSHA in Title 8 of the CCR. Specifically, 8 CCR 5155 establishes permissible exposure levels (PELs) and short-term exposure levels (STELs) for various chemicals including petroleum hydrocarbons. These requirements apply to all construction and exposure, whether contamination is discovered as part of construction or from other activities such as direct chemical use. The PELs and STELs establish levels below which no adverse health effects are expected. These requirements protect the health and safety of the workers and, by limiting workplace concentrations, limits potential exposures to nearby populations, including sensitive receptors.

- **Health and Safety Plans (HASP):** HASPs are prepared on a site-specific basis for contaminated sites and are developed in accordance with guidelines set forth in 8 CCR 5192 and 29 CFR 1910.120. HASPs include a review of site specific hazards and evaluation of the potential for chemical inhalation, ingestion, and absorption hazards, as well as a review of physical hazards (heat, slips, trips, falls, and noise) at the site. HASPs outline the required monitoring at the site for chemical exposures, particulate/dust, noise, and other site-specific hazards. For example, photoionization detectors (PIDs) are often used to monitor for vapors in the worker's breathing zone. Readings above 75 ppm for more than one minute generally require the use of respirators with organic vapor cartridges. Additional controls and measures are required when higher vapor readings are detected, e.g., full-face respirators, removal of workers from the site, etc. The use of respiratory protection minimizes worker exposures in the event that high levels of contaminants are encountered. HASPs outline requirements for training workers engaged in field activities on the potential health and safety hazards associated with their job function, in compliance with the HAZWOPER (29 CFR 1910.120) and other applicable OSHA standards. Other general health and safety requirements included in HASPs and enforced at contaminated worksites include site safety meetings, the use of personal protective equipment (e.g., gloves, coveralls, boots, hard hats, etc.), decontamination procedures, disposal procedures, communication procedures, emergency procedures, and recordkeeping requirements.

- **SCAQMD Rule 1166, VOC Emissions from Decontamination of Soil:** Under the SCAQMD-approved Rule 1166 monitoring plan, routine monitoring is required during excavation to detect VOC contamination that exceeds 50 ppmv. For, example, Rule 1166 requires monitoring for VOC contamination at least once every 15 minutes commencing at the beginning of excavation or grading and record all VOC concentration readings of VOC contaminated soil and appropriate mitigation, if VOC contamination exceeds 50 ppm. If contamination is discovered, the health and safety plan will be implemented that specifically requires the use of employees trained in hazardous material/waste procedures, personal protective clothing, and so forth that minimize employee exposure. These actions include the covering of the soil with tarps or other impermeable coverings. Actions to minimize employee exposure will also serve to reduce off-site exposures.

- **Resource Conservation and Recovery Act and Associated Hazardous and Solid Waste Amendments, 40 CFR 260:** RCRA created a major federal hazardous waste regulatory program that is administered by the U.S. EPA. The goal of RCRA, a federal statute passed in 1976, is the protection of human health and the environment, the reduction of waste, the conservation of energy and natural resources, and the elimination of the generation of hazardous waste as expeditiously as possible. The Hazardous and Solid Waste Amendments of 1984 significantly expanded the scope of RCRA by adding new corrective action requirements, land disposal restrictions, and technical requirements. The corresponding regulations in 40 CFR 260-299 provide the general framework for managing hazardous waste, including requirements for entities that generate, store, transport, treat, and dispose of hazardous waste. RCRA sets standards for transporters of hazardous waste. Hazardous waste removed from generating sites must be transported by licensed hazardous waste transporters. Transported materials must be accompanied by hazardous waste manifests. U.S. EPA approved California's program to implement federal hazardous waste regulations as of August 1, 1992.

- **Hazardous Waste Control Law (California Health and Safety Code, Chapter 6.5):** California's program to implement the federal RCRA requirements is referred to as the Hazardous Waste Control Law (HWCL) and administered by the Cal-EPA, DTSC. DTSC has adopted extensive regulations governing the generation, transportation, and disposal of hazardous wastes to implement the federal RCRA cradle-to-grave waste management system in California aimed at protecting human health and the environment. California hazardous waste regulations can be found in Title 22, CCR Division 4.5, Environmental Health Standards for the Management of Hazardous Wastes. The HWCL regulations establish requirements for identifying, packaging, and labeling hazardous wastes. They prescribe management practices for hazardous wastes; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous wastes that cannot be disposed of in landfills. Hazardous waste is tracked from the point of generation to the point of disposal or treatment using hazardous waste manifests. The manifests list a description of the waste, its intended destination, and regulatory information about the waste. In addition, California regulates the transportation of hazardous waste originating or passing through the state (13 CCR Title 13).

As discussed in the CARB Air Quality and Land Use Handbook: A Community Health Perspective, health risk decreases rapidly with distance (e.g., for gasoline dispensing stations, which handle light hydrocarbons, health risks at 500 feet from the source are less than one in one million) (CARB, 2005). Therefore, as demonstrated in the analysis above, exposure to VOC emissions from contaminated soil during construction activities by off-site residential receptors is expected to be less than significant because the distances to residential receptors is expected to be 1,000 to 2,000 feet from construction areas identified to have low concentrations of light hydrocarbons. Similarly, exposure to VOC emissions from contaminated groundwater during construction activities by off-site residential receptors, which are located no less than 1,000 feet from construction areas, is expected to be less than significant as well, because of the distance between construction activities and residential receptors.

The above analysis also demonstrates that existing laws, rules, and regulations that apply to the Refinery requiring safety equipment, professional safety training, etc., are expected to minimize worker exposure to VOC soil and groundwater contamination during construction. Further, if VOC contamination is encountered, monitoring and remediation required by existing laws, rules, and regulations would be expected to minimize the potential for worker exposure. Compliance with these laws will minimize the potential for worker exposure to less than significant. Finally, off-site exposure to hazardous levels of hydrocarbon emissions from contaminated soil and groundwater is not expected due to the existing laws, rules, and regulations that apply to the Refinery that minimize the potential for off-site exposure and the distance between the construction areas and the residential receptors. Therefore, on-site and off-site exposures to VOC contaminated soil and groundwater during construction activities for the proposed project are concluded to be less than significant.

4.3.2.7 Hazards Associated with the Increased H-100 Firing Rate and Increased Utilization

The project includes increasing the duty of H-100, the Wilmington Operations DCU fresh feed heater, and potentially an increase of crude capacity at the Refinery by up to 6,000 bbl/day or approximately two percent. The increased use of the heater will also enable more efficient production of gas oil and distillates from the charge to the DCU. In addition, the proposed project could result in changes to the operation of some existing tanks and heaters. Although no physical modifications will be made, the following units will experience increased utilization as a result of this project:

- Carson Storage Tanks 14 (gas oil), 31 (gasoline), 62 (gasoline), 63 (gasoline), 64 (gasoline), 502 (gas oil), and 959 (gas oil).

- Wilmington Storage Tanks 80074 (distillate), 80211 (gasoline blendstocks), 80215 (gasoline blendstocks) and 80217 (gasoline blendstocks).

- Carson Heaters Hydrocracker R-1, Hydrocracker R-2 and the Light Hydrotreating Unit Heater.
- Wilmington DCU Heater H-101.
- Wilmington Hydrotreater Unit #3 Heaters H-30 and H-21/22.
- Wilmington Catalytic Reforming Unit Heaters H-510, H-501A, H-501B, H-502, H-503/504.
- Wilmington Steam Generating Boilers 7, 8, 9 and 10.
- Sulfur Recovery Plant Boilers H-1601/1602.
- Sulfur Recovery Plant Incinerators F-704 and F-754.

No physical modifications or changes to existing SCAQMD permits will be made to any of the storage tanks at the Carson Operations (Tanks 14, 31, 62, 63, 64, 502 and 959) or Wilmington Operations (Tanks 80074, 80211, 80215 and 80217) so there will be no change in the capacity or type of product that could be stored in each tank. However, there may be an increased utilization (throughput), within existing limits and capacity associated with the operation of these tanks. Because there is no change in the maximum storage capacity or type of commodity stored in the tanks, there would be no change in the hazard zones or hazard impacts associated with these tanks. Increasing the throughput by approximately two percent is not expected to appreciably affect the probability of a hazardous event occurring.

The proposed project could also result in increased utilization for the heaters, boilers and Sulfur Recovery Plant Incinerators identified above. The proposed project may result in an increased use of the heater, boiler or incinerators (within existing permit limits) but would not require any physical modifications. Since there would be no physical modifications, there would be no change in the hazards associated with these combustion sources (heaters, boilers and Sulfur Recovery Plant Incinerators).

4.3.3 MITIGATION MEASURES

Mitigation measures are required, if feasible, to minimize the potentially significant “worst-case” off-site hazard impacts associated with the proposed modifications to the Naphtha Isomerization Unit, the proposed new crude tanks, SARP, and Interconnecting Pipelines (see Table 4.3-2). As discussed in Section 3.3.7 and Subsection 4.3.2.2, there are a number of rules, regulations, and laws governing the Refinery operations that will minimize the potential adverse impacts associated with hazards at the facility and which would minimize the hazards associated with the Naphtha Isomerization Unit, new crude storage tanks, SARP, and Interconnecting Pipelines. Under federal OSHA, regulations have been promulgated that require the preparation and implementation of a PSM Program (40 CFR Part 1910, Section 119, and Title 8, CCR, Section 5189). A PSM that meets the requirements of the regulations will minimize the consequences of a release involving a toxic, reactive, flammable, or explosive chemical. Only one feasible mitigation measures has been identified, over and above the extensive safety regulations that currently apply to the Tesoro Refinery.

Regulatory requirements have varying implementation requirements. For example, CalARP requires updates be made within six months of a change, while PSM regulations require Pre-Start Up Safety Review for new facilities and for modified facilities if the modification necessitates a change in the PSM. Depending on the modifications of an existing process unit, PSM may not apply if no change to Process Safety Information is expected. However, to ensure all proposed project components are evaluated and early compliance with regulatory requirements, mitigation measure HHM-1 is required so that applicable plans and Pre-Startup Reviews are completed for all proposed project components prior to the commencement of operations associated with new and modified project components, regardless of whether or not they are required to be included in the PSM.

HHM-1 To ensure all proposed project components are evaluated and early compliance with regulatory requirements are met, implementation of this mitigation measure shall be completed prior to the commencement of operations associated with new and modified project components. The applicant shall demonstrate to the Los Angeles City and County Fire Departments compliance with applicable hazardous material rules and regulations, to include, at minimum, an Emergency Action Plan as required by the Fire Department addressing spill, fire, and explosion hazards and relative risk of upset to adjacent land uses; PSM requirements under 40 CFR Part 1910, Section 119, and Title 8, CCR, Section 5189; and Article 2, Chapter 6.95 of the California Health and Safety Code that require facilities that handle listed regulated substances to develop RMPs to prevent accidental releases of these substances.

4.3.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The impacts of the proposed project on hazards associated with the Naphtha Isomerization Unit, new crude tanks, SARP, and Interconnecting Pipelines are expected to be significant. Compliance with existing PSM, RMP, and CalARP regulations and implementation of the recommended safety measures would minimize the potential impacts associated with a release, but are not expected to eliminate the potential hazard impacts. No feasible mitigation measures were identified to further reduce significant adverse hazard impacts. Therefore, hazards and hazardous material impacts generated by the proposed project are expected to remain significant.

4.4 HYDROLOGY AND WATER QUALITY

The NOP/IS (see Appendix A) determined the hydrology and water quality impacts of the proposed project at the Tesoro Los Angeles Refinery were potentially significant for water supply. The potential adverse impacts of the proposed project on water supply will be evaluated in this section. The NOP/IS also concluded that the proposed project would have less than significant impacts to water quality including wastewater generation. However, to provide a complete understanding of the water supply and wastewater discharge relationship, a discussion of the proposed project wastewater impacts is provided along with the analysis of water supply impacts.

4.4.1 SIGNIFICANCE CRITERIA

The proposed project impacts on hydrology and water quality would be considered significant if the following occurs:

Water Demand:

- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use more than 262,820 gallons per day of potable water.
- The project increases demand for water by more than five million gallons per day.

Water Quality:

- The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.
- The project will cause the degradation of surface water substantially affecting current or future uses.
- The project will result in a violation of NPDES permit requirements.
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.

4.4.2 ENVIRONMENTAL IMPACTS

4.4.2.1 Water Demand

4.4.2.1.1 Construction Impacts

Water demand during construction is limited to water applied for dust suppression and water needed to perform hydrostatic testing of new tanks and pipelines. Potential water demand impacts during construction are evaluated in the following subsections.

Dust Suppression

During construction of the proposed project, water will be needed for dust suppression as required during grading operations to prepare the construction areas for the placement of foundations for new equipment. Grading activities are expected to be limited to a two to three week period for each project component that has foundations (e.g., the new tanks, and the new SARP) and are not expected to overlap. Construction at the Carson Operations is expected to use an estimated maximum volume of 6,000 gpd of potable water based on the expected area to be graded for the six new crude tanks. Thus, construction at the Carson Operations will increase potable water demand. While the Carson Operations currently purchases reclaimed water, the Carson Operations purchases the maximum amount of reclaimed water available and no additional reclaimed water is available for purchase for dust suppression activities.

Only potable water is supplied to the Wilmington Operations by LADWP, potable water demand at the Wilmington Operations is estimated to be a maximum of 4,000 gpd for dust suppression purposes based on the expected area to be graded for the two new replacement crude storage tanks. Based on the construction schedule (see Figure 2-18), a number of construction activities during the peak construction period at the Carson Operations and the Wilmington Operations would occur simultaneously, but it is not clear whether or not peak water demand for dust control activities would occur specifically during these overlapping construction activities. Therefore, to ensure the most conservative water demand is analyzed, water demand from both Operations is assumed to occur at the same time and are analyzed concurrently, resulting in a potential potable water demand of 10,000 gpd, which is less than the SCAQMD significance threshold of 262,820 gpd of potable water and, thus, less than significant.

Hydrostatic Testing

During construction of the proposed project, water will also be needed to perform hydrostatic testing of the new tanks and connective piping. Hydrostatic testing involves filling a tank or piping with water to check for leaks and does not require the use of potable water. The water used for the hydrostatic testing tanks and associated tank piping will be Refinery wastewater that is diverted for testing prior to discharge to the industrial sewer system. Using diverted wastewater will eliminate the need for additional potable water supplies and will not increase the amount of wastewater generated by the Refinery, but will vary the discharge rate during construction. While the wastewater is diverted, the total daily discharge rate of the Refinery will decrease and upon completion of hydrostatic testing, the discharge rate will temporarily increase. It is expected that for a total of approximately four to six weeks distributed over the construction period, a temporary daily increase in water discharge will occur at the completion of hydrostatic testing.

New tanks and associated tank piping at the Carson Operations would be hydrotested using cooling tower blowdown water. Cooling tower blowdown is a wastewater stream which is discharged from the Carson Operations to the Los Angeles County Sanitation District (LACSD) sewer system. The Carson Operations currently discharge an average of approximately 3,650 gpm of treated wastewater to the LACSD with historic maximum discharges greater than 5,200 gpm, which is below the permitted discharge limit of 12,000 gpm. The typical rate for cooling tower blowdown is 1,000 gpm. During hydrostatic testing of the six new 500,000 barrel tanks, the cooling tower blowdown water will temporarily not be discharged to the LACSD and will be diverted for hydrostatic testing. Upon completion of the hydrotest for the new 500,000 barrel tanks and piping, the hydrotest water will be routed back to the Carson Operations for treatment, if necessary, and discharge to the LACSD. It is expected that the wastewater used for the testing will be discharged at a rate of no greater than 1,500 gpm for a temporary increase in the discharge rate to 5,150 gpm, which is less than the rate achieved in the past and is well below the permitted discharge rate. The available capacity in the daily discharge rate (permitted 12,000 gpm – current discharge 3,650 gpm = 8,350 gpm available) is sufficient to accommodate the hydrotest wastewater discharge without requiring additional water supplies or wastewater treatment facilities. Therefore, no permit modification or new wastewater treatment facilities are needed to accommodate the temporary increase in discharge of wastewater during hydrostatic testing from the Carson Operations.

New tanks and associated piping at the Wilmington Operations would be hydrotested with up to approximately 300,000 bbl of diverted treated process wastewater from the wastewater storage tank over a period of approximately one to two weeks. After being used for hydrostatic testing, the water will be returned to the Refinery wastewater system for discharge to the LACSD sanitary sewer system. The Wilmington Operations wastewater discharge limit is 10,000 gpm and the Wilmington Operations typically discharge an average of approximately 2,000 gpm during dry weather and 2,300 gpm during wet weather with historic maximum discharges greater than 3,000 gpm. It will take 300,000 barrels of wastewater to hydrotest the two new tanks, which would all be supplied by diverted wastewater. Once hydrostatic testing is complete, the wastewater will be treated again, if necessary, and discharged to the LACSD sewer system at a rate of approximately between 400 and 700 gpm for a temporary increase in the discharge rate to 3,000 gpm or less, which is less than or equal to the rate achieved in the past and is well below the permitted discharge rate. The available discharge capacity (10,000 gpm limit– current discharge 2,300 gpm = 7,700 gpm available) is sufficient to accommodate the hydrotest wastewater discharge. Therefore, no permit modification or new wastewater treatment facilities are needed to accommodate the temporary increase in discharge of wastewater during testing from the Wilmington Operations.

As indicated above, demand for water to perform hydrostatic testing of new tanks at both the Carson and Wilmington Operations can be supplied entirely using current wastewater streams at each operation. Once hydrostatic testing is completed, the hydrostatic testing wastewater would be returned to the Refinery's existing wastewater stream, treated as necessary, and then released to the LACSD sanitary sewer system without exceeding current wastewater limits, requiring changes to existing wastewater permit conditions, or requiring new wastewater permits.

Connective piping in process units at both the Carson and Wilmington Operations and the Interconnecting Pipelines that will be routed under the Alameda Corridor and Sepulveda Boulevard will be hydrotested using potable water, as there will be no access to the wastewater system at either the Carson or Wilmington Operation.

Given the large amount of time that will elapse between hydrostatic testing for the Interconnecting Pipelines and the tanks, even if hydrostatic testing for the Interconnecting

Pipelines is somewhat delayed, it is not expected to overlap with tank hydrostatic testing. Therefore, it is not expected that the fill rate of pipelines for hydrostatic testing would exceed the pump limit of 500 gpm, which corresponds to less than 30,000 gpd. Therefore, it is expected that a maximum of 30,000 gpd of potable water would be used to perform hydrostatic testing for the Interconnecting Pipelines installed at the Refinery as part of the proposed project.

The wastewater generated during hydrostatic testing of Interconnecting Pipelines will be a temporary wastewater stream generated during construction activities. The wastewater will be collected and added to the normal wastewater discharge at a rate no greater than that used for tank hydrostatic testing (i.e., less than 1,500 gpm at the Carson Operations and less than 700 gpm at the Wilmington Operations). As piping is completed it will be hydrotested and, where possible, the water will be transferred from one piping segment to the next completed segment. Hydrostatic testing for the new tanks would occur after completion of tank construction, approximately six months after completion of the Interconnecting Pipelines. Therefore, it is not expected that hydrostatic testing of Interconnecting Pipelines will occur concurrently with hydrostatic testing of tanks. Thus, adequate capacity in the current wastewater treatment facilities is available and no permit modifications would be required.

The total maximum daily potable water demand during construction is expected to be 40,000 gpd (10,000 gpd associated with dust suppression activities and up to 30,000 gpd for hydrostatic testing all new pipelines), which is less than the significance threshold of 262,820 gpd. Therefore, the proposed project will have less than significant impacts on water supply during construction. Further, wastewater diverted from existing wastewater streams for hydrostatic testing purposes as part of the proposed project is expected to be discharged in compliance with the existing Industrial Wastewater Discharge Permits (IWDPs) for the Refinery after completing the hydrostatic testing process. Since construction water discharges are expected to be discharge under the existing IWDPs, construction is not expected to require discharging wastewater under an NPDES permit. Therefore, changes to existing permit conditions will not be required and no violations of existing NPDES permit limits are expected.

4.4.2.1.2 Operational Impacts

The Refinery currently uses on average about 13.8 million gpd of fresh/potable water and about 4.5 million gpd of reclaimed water in its operations. At the time that the NOP/IS was prepared, it was estimated that the proposed project would result in a reduction in water demand because of shutting down the FCCU. However, upon further analysis, new or modified equipment has the potential to increase water demand. As shown in Table 4.4-1, the direct water demand of the proposed project is expected to require an estimated 173.4 gpm (about 249,696 gpd) of water for cooling purposes, an estimated 50 gpm (about 72,000 gpd) of boiler feed water, and an estimated 10 gpm (about 14,400 gpd) of water for desuperheating (i.e., to lower the temperature of superheated steam). Shutting down the FCCU at the Wilmington Operations as part of the proposed project will reduce existing wash water demand by an estimated 99 gpm (about 142,560 gpd) and cooling water by an estimated 415.50 gpm (about 598,320 gpd) as shown in Table 4.4-1. Therefore, the proposed project will increase the net direct water demand at the Refinery by about 76.5 gpm or about 110,160 gpd, which is less than the SCAQMD potable water demand significance threshold of 262,820 gpd.

Table 4.4-1

Proposed Project Water Demand

Activity	Rate (gpm)	Rate (gpd)
Direct Water Demands		
Carson Cooling Water [(a)]	173.40	249,696
Carson Boiler Feed Water	50.00	72,000
Carson Desuperheater Water	10.00	14,400
Wilmington Cooling Water [(b)]	-415.50	-598,320
Cooling Water, New SARP	357.60	514,944
Wilmington Wash Water [(c)]	-99.0	-142,560
Subtotal, Direct Water Demand	**76.5**	**110,160**
Indirect Water Demands		
Wilmington Cooling Water	56.33	81,115
Subtotal, Indirect Water Demand	**56.33**	**81,115**
Total Water Demand	**132.83**	**191,275**
Significance Threshold		**262,820**
Significant?		**No**

Note: Negative numbers represent reductions in water demand.

(a) Associated with changes at the Naphtha HDS, No. 51 Vacuum, Alkylation, and Wet Jet Treater Units

(b) Associated with the Wilmington FCCU shutdown, and changes at the HTU-1 and HTU-4 Units.

(c) Associated with the Wilmington FCCU shutdown.

The proposed project will require the installation of additional eye washes and emergency showers, which require potable water, near the new units. However, no constant increase in potable water demand is expected from the addition of these eye washes and showers, as the proposed project is not expected to increase the number of employees. The hazard analysis indicated that some modified and new equipment have the potential to create significant adverse impacts, which could result in the increased use of showers and eye washes. However, such incidents would occur extremely rarely, if ever, and additional water demand would return to the baseline levels after the incident is over.

As discussed in Section 4.1.2, equipment potentially indirectly affected by the proposed project (upstream and downstream) was evaluated to determine if the proposed project would result in an indirect water demand increase. Potential indirect water demand impacts, which are associated with increased processing in the downstream units that will require additional cooling, are included in the total water demand impact analysis of the proposed project (see Table 4.4-1). The overall change in water demand associated with implementing the proposed project is shown in Table 4.4-1. The combined total of the proposed project direct water demand and the additional indirect water demand from downstream units is 191,275 gpd.

As discussed in Section 3.4.1, the Refinery owns and operates private water wells to produce process water and purchases additional potable and reclaimed water to supplement the water drawn from the wells. The Refinery has adjudicated water rights that allow the production of up to 2.8 billion gallons of water per year from its wells. However, declining water production from two of the wells owned by the Refinery in the recent past has restricted the Refinery operators from using their historic production quantities within their adjudicated rights (as shown in Table 3.4-1, only 1.875 and 1.62 billion gallons per year were produced in 2012 and 2013, respectively). In 2014, the two old water producing wells were replaced with two new wells to allow the Refinery to produce additional quantities of well water within its adjudicated water rights. The two old wells were abandoned. The Watermaster Service Report (applicable water supply assessment per CEQA Guidelines Section 15155) provides the reported and allowed water use within the Basin, which bases future water availability on the adjudicated water rights within the Basin for regional water management. The incremental increase in water demand of 191,275 gpd (approximately 69.8 million gallons per year) from the proposed project is expected to be produced by the privately-owned wells (i.e., from the available 1.2 billion gallons per year of adjudicated water rights). The existing water supply can meet the water demand of the proposed project and the daily water demand associated with the proposed project is less than the significance threshold of 262,820 gpd. Therefore, the proposed project water supply impacts are expected to be less than significant.

The proposed project is expected to reduce overall wastewater generated during operation at the Refinery by an estimated 55.1 gpm (79,344 gpd) (see Table 4.4-2). This is due, in large part, to the shutdown of the Wilmington Operations FCCU. While there will be an increase in wastewater generation from some operations, such as the SARP, adequate capacity in the existing wastewater treatment facilities is available as described in Section 4.4.2.1.1. Therefore, no new wastewater treatment facilities are needed and the existing facilities are adequate to meet the needs of the proposed project. As such, the proposed project water quality impacts would be less than significant.

4.4.3 MITIGATION MEASURES

No significant impacts associated with water demand and wastewater discharge are expected from the proposed project, so no mitigation measures are required.

4.4.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The proposed project impacts on hydrology and water quality are expected to be less than significant.

Table 4.4-2

Wastewater Changes Associated with the Proposed Project

Affected Process	Rate Change (gpm)	Rate Change (gpd)
Carson Stripping Steam	8.0	11,520
Carson Cooling Tower Blowdown	34.7	49,968
Wilmington Cooling Tower Blowdown	-73.8	-106,272
Carson Boiler Blowdown	3.5	5,040
Carson Desuperheater Water[(a)]	0.0	0
Wilmington Wash Water[(b)]	-99.0	-142,560
New SARP	71.5	102,960
Wastewater Discharge Change	-55.1	-79,344

Note: Negative numbers represent reductions in wastewater generation.

(a) Condensate is recycled.

(b) Associated with the Wilmington FCCU shutdown.

4.5 NOISE

The NOP/IS (see Appendix A) determined that the proposed project at the Tesoro Los Angeles Refinery has the potential to generate significant adverse noise impacts during construction and operation. Potential noise impacts associated with the proposed project construction and operational activities are evaluated in this section. The noise analysis in Section 4.5 is based on the Noise Impact Assessment prepared for the proposed project by Navcon and found in Appendix D.

4.5.1 THRESHOLDS OF SIGNIFICANCE

Sensitive noise receptors in the vicinity of the proposed project fall within three jurisdictions, the Wilmington District of the City of Los Angeles, the City of Carson, and the City of Long Beach (see Figure 3.5-2). The significance thresholds used for this noise analysis rely on the Los Angeles CEQA Thresholds Guide (City of Los Angeles 2006) and the vibration significance criterion corresponds to Federal Transit Administration (FTA) Vibration Impact Criteria for General Assessment, which sets acceptability limits for vibration in buildings (including residential structure).

A project would be considered to have a significant adverse noise or vibration impact under the following circumstances:

- Construction of the proposed project would have a significant noise impact if construction noise levels exceed the local noise ordinances, or if the noise ordinance is currently exceeded, if ambient Community Noise Exposure Levels (CNEL) would be increased by 3.0 dBA or more at a noise sensitive receptor during the construction period.

- Operation of the proposed project would have a significant noise impact if proposed project operational noise levels exceed any of the local noise ordinances at the site boundary or, if the noise threshold is currently exceeded, ambient CNEL noise levels would be increased by 3.0 dBA or more at a noise sensitive receptor.

- Construction and operation of the proposed project would have a significant vibration impact if ground vibration levels for residential structures would exceed 72 vibration decibels (VdB) for frequent events (70+ vibration events), 75 VdB for occasional events (30-70 events), and/or 80 VdB for infrequent events (30 or fewer events), the acceptability limits prescribed by the FTA.

The local noise ordinances are summarized in Subsection 3.5.3 for the jurisdictions in which the project is located (i.e., the Cities of Carson and Los Angeles). In order to provide a conservative analysis of noise impacts, noise impacts will be considered significant if there would be an increase of 3.0 dBA or more during construction and operational activities as the use of the noise ordinances could allow increases greater than 3.0 dBA.

4.5.2 ENVIRONMENTAL IMPACTS

4.5.2.1 Construction Noise Impacts

Proposed project construction is anticipated to increase noise levels temporarily at noise-sensitive (e.g., residential) receptors in the vicinity of the Tesoro Los Angeles Refinery, because heavy construction equipment is required during construction activities associated with the proposed project. The magnitude of the increases would depend on the type of construction activity, the noise level generated by various pieces of construction equipment, site geometry (i.e., shielding by intervening fences, buildings, and other structures), and the distance between the noise source and the receptors.

Noise from construction activities is generated by a broad array of construction equipment. Table 4.5-1 shows the noise level ranges of typical construction equipment. These noise sources will operate primarily during daylight hours and will be a source of noise over the construction period.

TABLE 4.5-1

Example of Noise Levels from Construction Noise Sources

EQUIPMENT	TYPICAL RANGE (decibels)[(a)]
Truck	82-95
Front Loader	73-86
Backhoe	73-95
Vibrator	68-82
Air Compressor	85-91
Saws	72-82
Jackhammers	81-98
Pumps	68-72
Generators	71-83
Compressors	75-87
Concrete Mixers	75-88
Concrete Pumps	81-85
Pile Driving (peaks)	95-107
Tractor	77-98
Scrapers, Graders	80-93
Pavers	85-88
Cranes	75-89

(a) City of Los Angeles, 2006. Levels are in dBA at 50-foot reference distance.

Construction noise levels were estimated based on the types of equipment proposed to be used on-site to complete the various construction activities. These sources include equipment such as loaders, dozers, cranes, trucks, pavers, etc. During any construction project, the overall average noise levels vary with the level of construction activity and the types of equipment that are on-site and operating at a particular time. In order to provide a conservative estimate of potential noise impacts, the construction noise assessment in this EIR assumes that all construction activities would occur during the same timeframe and construction would occur 24-hours per day. As discussed in Section 2.8, the estimated construction schedule is expected to begin in third quarter of 2016 and be completed in second quarter of 2021. During normal construction periods, one work shift per day is expected beginning at 7 a.m. and ending at 5:30 p.m. (allowing 30 minutes for lunch). During Refinery turnaround periods (when some of the Refinery Units are shut down), two work shifts are expected and work may be conducted 24 hours per day. Shifts would operate from 6:00 a.m. to 6:00 p.m. and 6:00 p.m. to 6:00 a.m. It is common for construction/maintenance activities to occur 24 hours per day during all Refinery turnarounds to minimize the time when the Refinery unit is not operating and 24-hour construction maintenance activities normally occur during all Refinery turnarounds. The construction noise was modeled using the SoundPLAN model to estimate the noise levels that would occur within the residential areas adjacent to the Carson and Wilmington Operations.

The sound pressure levels at 50 feet were used to determine the equipment sound power emission levels using the procedures described in the Federal Highway Administration (FHWA) Roadway Construction Noise Model (FHWA-RCNM October 2006) and the Federal Transit Authority (FTA) Noise and Vibration Guidance Handbook. The construction noise source data are summarized in Appendix D. The construction noise model parameters were as follows:

- The construction noise model represents a worst-case scenario by assuming that all construction activities will occur at the same time.
- The construction noise power emission levels were based upon FHWA Roadway Construction Noise Model.
- The construction equipment was modeled as a line stationary source along the pipelines.

Three dimensional noise models of the proposed project were created using the noise modeling software, SoundPLAN. Actual noise monitoring in the vicinity of the Refinery was used to estimate baseline noise levels (see Chapter 3.5.2.2 for further details). The results of the noise modeling associated with the proposed project construction activities are shown in Table 4.5-2.

There are several existing noise-sensitive populations adjacent to the Refinery. The closest residential areas to construction activities associated with the proposed project are residents west of Wilmington Avenue, adjacent the Tesoro property but 1,300 feet west of the construction area of the six new crude tanks (see Receptor #4, Table 4.5-2 and Figure 3.5-2). The predicted noise levels at the noise-sensitive locations during the construction period, as well as the change from the CEQA baseline levels, are summarized in Table 4.5-2. The noise increase associated with construction activities was predicted by subtracting the baseline noise estimates from the total noise estimates predicted during construction activities (i.e., Baseline and Construction noise estimates minus the Baseline noise estimates). As Table 4.5-2 shows, construction activities would add less than the significance threshold of 3.0 dBA to the adjacent residential communities, including all noise-sensitive receptors. The noise levels at the closest residential areas are expected to increase from 0.1 to 0.9 dBA depending on the location and the time of day. No significant noise impacts related to project construction are expected within the nearby residential areas.

TABLE 4.5-2

Proposed Project Estimated Construction Noise Levels

Receptors[(a)]	Baseline 2014[(b)]			Construction			Baseline & Construction			Overall Change		
	CNEL[(c)]	Leq,d[(d)]	Leq,n[(e)]	CNEL	Leq,d	Leq,n	CNEL[(f)]	Leq,d	Leq,n	CNEL	Leq,d	Leq,n
#1 Merimac Ave/W Willard St, City of Long Beach	72.8	69.2	64.9	59.0	57.7	47.9	73.0	69.5	65.0	0.2	0.3	0.1
#2 Mauretania St/Goodrich Ave, City of Los Angeles	76.4	70.1	69.8	64.4	63.7	52.7	76.7	71.0	69.9	0.3	0.9	0.1
#3 Drumm Ave/E Sandison St. City of Los Angeles	72.7	68.4	65.4	58.6	57.2	47.7	72.9	68.7	65.5	0.2	0.3	0.1
#4 Wilmington Ave/E Pacific St. City of Carson	68.2	65.0	60.3	59.0	58.2	47.2	68.7	65.8	60.5	0.5	0.8	0.2

(a) Refers to noise locations shown in Figure 3.5-2.
(b) Includes all ambient noise sources. Noise levels are from Table 3.5-3.
(c) CNEL – Community Noise Exposure Level (5 dB penalty 7 p.m. – 10 p.m., 10 dB penalty 10 p.m. – 7 a.m.).
(d) Leq,d – Average Sound Level Day Time (7 a.m.– 10 p.m.).
(e) Leq,n – Average Sound Level Night Time (10 p.m. – 7 a.m.).
(f) The total sound level was modeled, see Appendix D. Sound is measured on a logarithmic scale and, therefore, baseline combined with construction is not simply additive.

Workers exposed to noise sources in excess of 85 dBA for an eight-hour period will be required to wear hearing protection devices that conform to OSHA/NIOSH standards (see Subsection 3.5.3.1). Required compliance with the applicable OSHA and NIOSH standards (as described in Subsection 3.5.3.1) will ensure that construction workers are not exposed to harmful noise levels in excess of 85 dBA for an eight-hour time period.

Based on the above analysis, all potential noise impacts from the proposed project during the construction phase are expected to be less than significant.

4.5.2.2 Operational Noise Impacts

The proposed project will add equipment to the existing Refinery so that there will be additional operational noise sources at the facility. Additional noise sources associated with the proposed project generally include process equipment components such as valves, flanges, vents, pumps, and compressors. Additional noise sources at the Refinery are expected to include the following:

- New pumps associated with the No. 51 Vacuum Unit modifications;
- New air cooler and pumps associated with the HCU modifications;
- New pumps associated with the LPG rail unloading rack;
- New pumps associated with the HTU-4 modifications;
- New air cooler and pumps associated with the Naphtha HDS Unit modifications;
- New pumps associated with the Naphtha Isomerization Unit modifications;
- New pumps associated with the Alkylation Unit modifications;
- New equipment associated with the Wet Jet Treater;
- New pumps associated with the new crude storage tanks;
- New equipment associated with the PSTU;
- New pumps associated with CRU-3;
- New pumps associated with the HTU-1 and HTU-2 modifications;
- New equipment associated with the SARP; and
- New equipment (Venturi Scrubber) associated with the Coker Unit modifications.

In addition to the increase in the number of noise sources at the Refinery, the proposed project will also remove noise sources at the Wilmington Operations FCCU; however, the reduction in noise associated with the shutdown of the Wilmington Operations FCCU was not included in the noise analysis to provide a conservative estimate of project noise impacts. Noise impacts during operational activities were estimated after the completion of construction activities when all new sources are expected to be operational. Refinery operations are continuous over a 24-hour period.

The SoundPlan model predicted noise levels at full operation for all noise sources associated with the proposed project, including increased traffic (see Table 4.5-3). The noise increase associated with proposed project (only) was predicted by subtracting the baseline noise estimates from the total Baseline and Operation noise estimates predicted (i.e., Baseline plus Operations noise estimates, minus Baseline noise estimates).

As shown in Table 4.5-3, the model results indicate that the CNEL levels within residential areas would increase by less than the 3.0 dBA significance threshold as a result of the operation of the proposed project. The only projected noise increase (0.1 dBA at Receptor 2) is the residential area west of Alameda Street, north of Pacific Coast Highway. The noise levels associated with the operation of the proposed project at the three other sensitive noise receptor locations are expected to remain the same as existing noise levels at all residential receptors adjacent to the Refinery, i.e., no changes in noise levels are expected. Potential noise impacts at all receptor locations are predicted to be less than 3.0 dBA and, therefore, noise impacts associated with the operation of the proposed project would be less than significant.

Portions of the proposed project are expected to become operational during the construction period. As shown in Table 4.5-3, the change in operational noise levels is not expected to be discernible from baseline noise levels. Therefore, the results in Table 4.5-2, which are less than significant, are representative of the expected noise levels during the period of construction that is concurrent with operation of the proposed project.

TABLE 4.5-3

Project Operational Noise Levels

Receptors[a]	Baseline 2014[b]			Operations			Baseline & Operations			Overall Change		
	CNEL[c]	Leq,d[d]	Leq,n[e]	CNEL	Leq,d	Leq,n	CNEL[f]	Leq,d	Leq,n	CNEL	Leq,d	Leq,n
#1 Merimac Ave/W Willard St. City of Long Beach	72.8	69.2	64.9	46.0	39.3	39.3	72.8	69.2	64.9	0.0	0.0	0.0
#2 Mauretania St/Goodrich Ave, City of Los Angeles	76.4	70.1	69.8	59.3	52.6	52.6	76.5	70.2	69.9	0.1	0.1	0.1
#3 Drumm Ave/E Sandison St, City of Los Angeles	72.7	68.4	65.4	45.8	39.1	39.1	72.7	68.4	65.4	0.0	0.0	0.0
#4 Wilmington Ave/E Pacific St, City of Carson	68.2	65.0	60.3	42.9	36.3	36.3	68.2	65.0	60.3	0.0	0.0	0.0

(a) Refers to the sampling locations identified in Figure 3.5-2.
(b) Includes all ambient noise sources. Noise levels are from Table 3.5-3.
(c) CNEL – Community Noise Exposure Level (5 dB penalty 7 p.m.– 10 p.m., 10 dB penalty 10 p.m.– 7 a.m.).
(d) Leq,d – Average Sound Level Day Time (7 a.m.– 10 p.m.).
(e) Leq,n – Average Sound Level Night Time (10 p.m.– 7 a.m.).
(a) The total sound level was modeled, see Appendix D. Sound is measured on a logarithmic scale and, therefore, baseline combined with construction is not simply additive.

4.5.2.3 Vibration Impacts

Construction of the proposed project would involve equipment and activities that may have the potential to temporarily generate groundborne vibration. Groundborne vibration is generally caused by equipment with moving or oscillating parts. Construction equipment is operated sporadically during different construction activities and involves movement of the construction equipment or movement of other objects (e,g., moving dirt piles or site grading, moving new equipment into place, removing equipment no longer being used, etc.) by construction equipment. The FTA has published standard vibration levels and peak particle velocities[1] for construction equipment operations (FTA, 2006). The approximate velocity level and peak particle velocities for large construction equipment are listed in Table 4.5-4. Groundborne vibration is quantified in terms of decibels, since that scale compresses the range of numbers required to describe the oscillations. The FTA uses vibration decibels (abbreviated as VdB) to measure and assess vibration amplitude. In the United States, vibration is referenced to one

[1] The peak particle velocity is defined by the FTA as the maximum instantaneous positive or negative peak of a vibration signal.

micro-inch/sec (converted to 25.4 micro-mm/sec in the metric system) and presented in units of VdB. Based on the activities and equipment which would be used during the proposed project construction phases, the construction equipment source levels are estimated to range between 58 VdB and 100 VdB at a distance of 25 feet.

TABLE 4.5-4

Construction Vibration Impacts

Equipment	Estimated Peak Particle Velocity at 25 Ft. (inches/second)[(a)]	Estimated Velocity Level at 25 Ft. (VdB)[(b)]	Estimated Velocity Level at Closest Residential Area (VdB)	Significant? (Exceeds 72 VdB)[(c)]
Pile Driver typical	0.644	100	71	No
Large Bulldozers	0.089	87	58	No
Loaded Trucks	0.076	86	57	No
Jackhammer	0.035	79	50	No
Small Bulldozer	0.003	58	29	No

(a) Source: FTA, 2006. Data reflects typical vibration level.
(b) Distance to closest off-site receptor. Assumes an estimated six VdB reduction for every doubling of distance per FTA 2006.
(c) FTA Ground-Borne Vibration Impact Level (FTA, 2006).

When analyzing groundborne vibration, the FTA recommends using an estimated six VdB reduction for every doubling of distance (FTA, 2006). Using the FTA methodology, the groundborne vibration levels at the closest residential receptor (about 1,300 feet west of the six new crude oil storage tanks), the VdB would range from 29 to 71 VdB (see Table 4.5-4). The predicted vibration during construction activities can be compared to the FTA groundborne vibration impact level of 72 VdB, which is the level above which human annoyance or interference with vibration-sensitive equipment is expected to occur. Levels of vibration below the FTA groundborne vibration impact level are considered less than significant by the FTA. Therefore, because the vibration from construction activities is less than the FTA vibration impact level significance threshold and because the SCAQMD is using the same groundborne vibration level significance threshold as the FTA, no significant adverse vibration impacts are expected during the construction period.

The equipment associated with the operation of the proposed project is not expected to generate detectable groundborne vibration during normal operation because new and modified equipment is not expected to have oscillating parts which have the potential to generate groundborne vibration. Therefore, vibration from operation of the proposed project is expected to be less than significant and no significant vibration impacts are expected during operation.

4.5.3 MITIGATION MEASURES

No significant adverse impacts associated with noise or vibration are expected from the proposed project during construction or operational phases, so no mitigation measures are required.

4.5.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The noise or vibration impacts of the proposed project during construction and operational activities are expected to be less than significant.

4.6 SOLID AND HAZARDOUS WASTE

The NOP/IS (see Appendix A) determined that construction and operation of the proposed project could generate potentially significant adverse solid and hazardous waste impacts. Therefore, Section 4.6 addresses the potential solid and hazardous waste impacts associated with the proposed project.

4.6.1 THRESHOLDS OF SIGNIFICANCE

The proposed project would have a significant impact on solid and hazardous waste if it would:

- Result in an increase in solid or hazardous waste generation due to project operations that would exceed the capacity of existing solid or hazardous waste handling and disposal facilities.

4.6.2 CONSTRUCTION IMPACTS

Solid Waste: Construction activities will involve some demolition, grading, and excavating activities that could generate solid waste. Demolition activities could generate demolition waste, while grading and excavating could uncover contaminated soils since the proposed project activities are located in existing industrial areas.

Construction and demolition associated with the proposed project could generate debris in the form of concrete, asphalt, structural elements, metal waste, and other building components, some of which would require disposal in a landfill. In 2008, debris from construction and demolition made up approximately 16 percent of the State of California's waste disposal (CIWMB/CalRecycle 2009). Asphalt and concrete are typically recycled for aggregate base or, due to lower disposal costs, may be disposed of at inert landfills (e.g., Azusa landfill) instead of municipal landfills.

The proposed project includes the demolition and removal of two existing storage tanks and affected existing piping at the Wilmington Operations. The tanks and piping are constructed of steel. Because steel is a commodity, it would be sent for recycling in lieu of disposal in a landfill. Demolition of the concrete pads of the existing tanks is expected to result in an estimated 265 cubic yards of concrete waste material that would be transported off-site for crushing and recycling.

Solid waste (i.e., construction debris and non-hazardous soil) generated during construction of the proposed project that may require disposal will be stored on the Refinery property prior to disposal at one of the landfills in southern California. Daily shipments of solid waste to landfills would be scheduled to avoid exceeding the landfills' permitted daily capacities, if applicable. The total remaining permitted Class III landfill capacity in southern California is estimated to be approximately 129.2 million tons (about 2,584 million cubic yards). The landfills in southern California have the capacity to accept the solid waste produced during the construction phase of the proposed project on a one-time basis (see Table 3.6-6). In addition, because a percentage of the solid waste has economic value (steel) or can be recycled (concrete), the amount of solid waste generated by the construction of the proposed project (206,953 cubic yards, see Table 4.6-1) is expected to be relatively small compared to the total amount of solid waste generated in Los Angeles County (over 8,800,000 tons per year, see Table 3.6-4). Therefore, the proposed project is not expected to result in a significant impact on solid waste during the construction phase.

Hazardous Waste: Site preparation, grading, and construction activities for the proposed project have the potential to encounter contaminated soils. As part of the planning for the proposed project, soil samples have been collected in areas of the Refinery where construction is expected to take place to characterize the soil (i.e., uncontaminated, hazardous or non-hazardous waste designation). A conservatively high estimate of the volume of contaminated soil that could potentially be encountered during project construction has been developed (see Table 4.6-1). Based on the soil samples, it is estimated that a total of approximately 290,148 cubic yards of contaminated soil may be encountered during construction, which would require removal and reuse or disposal: Of the total, it is estimated that approximately 83,213 cubic yards would be hazardous waste, and approximately 206,953 cubic yards would be non-hazardous waste. Reuse of non-hazardous soil suitable for fill on proposed project components is expected to reduce the quantity of soil transported offsite for disposal.

With respect to contaminated soils (both hazardous and non-hazardous), Tesoro would consider the type and extent of contamination and explore the variety of options available for disposal and remediation. Laboratory analyses for characterization of the excavated soil will be compared to criteria established for acceptable levels of contaminants for the various disposal and remediation options, which could include *in situ*, on-site, and off-site treatment (e.g., incineration, soil vapor extraction, bioremediation, etc.). As shown in Table 4.6-1, an estimated 83,213 cubic yards of soil may be considered hazardous waste. Hazardous contaminated soil that cannot be treated/remediated could be taken to Kettleman Hills Landfill, Clean Harbors Buttonwillow, or another Class I landfill in the United States. The Kettleman Hills facility has sufficient available capacity of about 5,000,000 cubic yards and the Clean Harbors Buttonwillow facility has available capacity of over 8,000,000 cubic yards to handle the estimated one-time contaminated soil waste generated by construction activities associated with the proposed project. In addition, other hazardous waste disposal facilities are available for off-site disposal in other states. Since the amount of disposal capacity necessary to dispose of contaminated soils is well below the capacity of the available Class I landfills, no significant adverse hazardous waste impacts will occur from the proposed project. Non-hazardous soil that cannot be used onsite will be disposed of at a Class III landfill. The construction impacts associated with the proposed project represent a one-time increase in solid/hazardous waste during the construction phase only.

The potential for exposure to contaminated soil, the potential impacts, and the applicable rules and regulations are discussed in Section 4.3.2.6. It is expected that contaminated soil encountered during the proposed project construction would be managed in compliance with all applicable rules and regulations discussed in Sections 3.6.3 and 4.3.2.6.

TABLE 4.6-1

Estimated Waste Streams from Construction Activities

Description	Total Cubic Yards	Hazardous Waste (cubic yards)	Non-Hazardous Waste (cubic yards)
Wilmington SARP	3,261	783	2,478
Wilmington HTU-1	400	96	304
Wilmington HTU-1 &2	1,653	397	1,256
Wilmington HTU-4	3,734	896	2,838
Wilmington HCU	955	229	726
Wilmington HCU, CRU-3, PSTU	174	42	132
Wilmington Crude Tanks	95,000	20,000	75,000
Electrical Intertie	5,343	1,282	4,061
Carson Wet Jet Treater	1,011	243	786
Carson Naphtha HDS	1,318	316	1002
Carson Naphtha Isomerization Unit	689	165	524
Carson LHU	1,653	397	1,256
Carson Alky	1,133	272	861
Carson HCU	418	100	318
Carson No 51 Vac Unit	1,294	311	983
Carson Dehexanizer	982	236	746
Carson LPG Railcar U/L	764	183	581
Carson Steam Generation	640	154	486
Carson outside limits of existing units	29,160	6,998	22,162
Interconnecting Pipelines	50,566	10,113	40,453
Carson 500,000 bbl Crude Tanks	90,000	40,000	50,000
Total Waste Volume	**290,148**		
Total Hazardous Waste Volume		**83,213**	
Total Non-Hazardous Waste Volume			**206,953**

Prior to demolition, structures would be inspected by qualified personnel for the presence of asbestos-containing materials and lead-containing surface coatings (LCSCs) and/or lead-based paint (LBP). If asbestos that could become friable during demolition is found in a building material, or if LCSC and LBP are found, these materials would be removed and disposed of in compliance with U.S. EPA, the City of Los Angeles Bureau of Sanitation, and the South Coast Air Quality Management District regulations prior to demolition. Demolition of substantial Refinery structures, which is where asbestos, LCSC, LBP would most likely be found, is not included as part of the proposed project, so significant adverse impacts associated with LCSC, LBP, or asbestos are not expected. Note that the Wilmington FCCU is expected to be abandoned in place and the proposed project does not include demolishing it.

4.6.3 OPERATIONAL IMPACTS

Solid Waste: As noted in Subsection 3.6.1.2, Table 3.6-7, an average of 39,099 tons per year of solid waste was generated by the Tesoro Refinery in 2012/2013. Once the proposed project becomes operational, the average annual amounts of solid waste are not expected to change because there would be no increase in the number of workers and refinery units do not typically generate solid waste. Solid waste is generated from routine office activities such as paper, cans, bottles, cardboard boxes, etc. There would be no increase in workers, so no increase in solid waste is expected.

Hazardous Waste: Wastes generated by the operation of the proposed project will be managed and/or disposed of in compliance with applicable federal, state, and local statutes and regulations discussed in Section 3.6.3. The proposed new and modified equipment associated with the proposed project will perform similar functions as the existing equipment and will use the same types of materials necessary to process crude oil into refined products. The proposed project is expected to increase the amount of spent sulfuric acid, primarily from the Carson Operations Alkylation Unit. Following completion of the SARP, eight trucks per day would transport spent sulfuric acid from the Carson Operations to the SARP at the Wilmington Operations. All of the spent sulfuric acid from Wilmington Operations would then be treated on-site and reused, so increased production of spent sulfuric acid will not create an additional hazardous waste stream from the Refinery requiring disposal.

The proposed project includes constructing the SARP which requires a sulfuric acid catalyst that is expected to be a silica-based vanadium salt complex catalyst. Therefore, the proposed project will result in an increase in the use of catalyst and is expected to generate increased amounts of spent catalyst waste associated with the SARP. The volume of catalyst to be used in the SARP is currently unknown but based on similar units operated at other facilities in the U.S., a portion of the catalyst (estimated to be 30 percent) is expected to require changing approximately every two to three years. The spent catalyst is expected to be recycled for the metal content. Recycling facilities are selected through a qualification process that evaluates availability to process the material, location, handling practices, and cost.

The Wet Jet Treater uses caustic to convert mercaptans to disulfides and reduces the total acid content of the feed. Spent caustic from the Wet Jet Treater will be generated at a rate of approximately 4.5 gpm or about 6,480 gpd. Additionally, caustic vent scrubbers may be installed for air pollution control at the SARP. The combined use of caustic from the Wet Jet Treater, and SARP will bring the rate of spent caustic generation to approximately 11 gpm or 12,960 gpd. Spent caustic is currently recycled or reused on-site in the Refinery and then discharged. The spent caustic that is not reused on-site will first be transported via truck to the Ventura Trucking facility (located adjacent to the Tesoro administration building on 223rd Street) where it would be loaded onto rail (approximately four railcars per week) and sent to the Gulf Coast for recycling. No additional waste streams that require disposal will be generated by the Wet Jet Treater or the SARP. Since all spent caustic will be sent to a recycling facility for regeneration, increased production of spent caustic will not create an additional hazardous waste stream from the Refinery requiring disposal.

The operation of storage tanks does not routinely generate non-hazardous or hazardous wastes. The proposed project has the potential to generate additional sludge during tank cleaning operations which occur once every ten to 20 years. Periodically, for maintenance, storage tanks are currently emptied and cleaned, resulting in a sludge that generally requires treatment to recover useful product (oil), etc., and disposal (e.g., disposal at a hazardous waste or non-hazardous waste landfill, depending on the concentration of various constituents). The proposed project includes the replacement of existing Tanks 80035 and 80036 with larger new Tanks 300035 and 300036 and the construction of six new crude oil storage tanks. The proposed project could generate additional amounts of sludge wastes associated with periodic tank cleaning operations. The daily volume of waste generated during the periodic cleaning of the new storage tanks is expected to be about the same as current operations because no change in the method for tank cleaning is proposed and no more than one storage tank would be cleaned at any time. It takes several days to several weeks to clean storage tanks, depending on the size and the material stored in the tanks. The sludge is expected to remain on-site and will be used as feedstock to the DCU (i.e., recycled on-site); therefore, no increase in waste disposal would be expected from operation of the new and modified storage tanks. Both Carson and Wilmington Operations currently recycle oil-bearing refinery materials, such as tank bottoms into the DCUs. Additionally, since both Carson and Wilmington DCUs currently handle tank bottoms and no change in the volume of daily tank bottom recovery is expected, the proposed project will have no effect on the DCU's capacity to handle tank bottom sludge volumes after the proposed project becomes operational. Therefore, no increase in waste disposal would be expected from the storage tanks.

As explained above, while operation of the proposed project may generate solid or hazardous waste streams, those waste streams are: not expected to exceed the disposal capacity of any landfills where the waste would likely be sent or would be reused or recycled. Therefore, operation of the proposed project is not expected to require additional waste disposal capacity and will not interfere with the Tesoro Refinery's ability to comply with existing federal, state, and local regulations for solid and hazardous waste handling and disposal. Therefore, significant solid and hazardous waste impacts are not expected from construction and operation of the proposed project.

4.6.4 MITIGATION MEASURES

No significant adverse impacts associated with solid or hazardous wastes are expected from the proposed project during construction or operational phases, so no mitigation measures are required.

4.6.5 LEVEL OF SIGNIFICANCE AFTER MITIGATION

No significant adverse solid or hazardous wastes impacts are expected.

4.7 TRANSPORTATION AND TRAFFIC

The NOP/IS concluded that the traffic impacts associated with the construction phase and parking during the construction phase were potentially significant and would be evaluated in the Draft EIR (see Appendix A). The other transportation and traffic issues were determined to be less than significant and do not require additional environmental review. Potential traffic impacts associated with the proposed project construction activities are evaluated in this section. The transportation and traffic analysis in Section 4.7 is based on the Traffic Impact Analysis prepared for the proposed project by Iteris and found in Appendix E.

The geographic study area of the transportation analysis includes streets and intersections that would be used by truck and automobile traffic in connection with the proposed project to gain access to and from the Tesoro Los Angeles Refinery. The study area includes streets and intersections within the Cities of Los Angeles, Carson, and Long Beach. The technical traffic analysis data, and worksheets for all analyses conducted for the baseline and impact scenarios are included in Appendix E, and provide additional details to support the findings of the impact analysis presented in this section.

The traffic study analysis includes several scenarios to describe baseline and future conditions without the proposed project, during the construction of the proposed project, and in the operational phase of the proposed project. The traffic study includes analyses of baseline conditions, peak construction activities, and year 2020 traffic conditions, which represent future traffic growth and operating conditions at study locations due to population growth not associated with the proposed project. Therefore, this analysis addresses the proposed project's contribution to cumulative traffic growth and congestion.

4.7.1 THRESHOLDS OF SIGNIFICANCE

Transportation and traffic significance criteria are based on the location of each analyzed intersection and the proposed project's effect on traffic congestion at affected roadways and intersections. Two types of significance criteria will be used: the Intersection Capacity Utilization (ICU) methodology will be used for intersections under the Cities of Los Angeles, Carson, and Long Beach jurisdictions; and the Highway Capacity Manual (HCM) methodology will be used for intersections under Caltrans jurisdiction. The ICU methodology bases LOS on the volume-to-capacity ratio while the HCM methodology bases LOS on the average vehicle delay experienced by all vehicles traveling through the intersection. Table 3.7-1 presents both the V/C ratio and average delay associated with each LOS grade as well as a qualitative description of intersection operations at that grade.

For intersections under City of Los Angeles and Carson jurisdictions, the proposed project's impacts on transportation and traffic would be considered significant if any of the following significance criteria occurs (using the ICU methodology):

- Peak period levels on major arterials are disrupted to a point where the LOS is reduced to D, E, or F for more than one month.

- An intersection's volume to capacity (V/C) ratio increases by 0.02 (two percent) or more when the LOS is already D, E, or F.

For freeway ramp intersections, the proposed project's impacts on transportation and traffic would be considered significant if the following significance criteria occur (using the HCM methodology):

- Peak period levels on major arterials are disrupted to a point where the LOS is reduced to D, E, or F for more than one month.

The following significance thresholds apply to all portions of the proposed project, regardless of the jurisdiction:

- The project conflicts with applicable policies, plans or programs establishing measures of effectiveness, thereby decreasing the performance or safety of any mode of transportation.

- A major roadway is closed to all through traffic and no alternate route is available.

- The demand for parking facilities is substantially increased.

4.7.2 CONSTRUCTION IMPACTS

The proposed project’s impacts on traffic during construction are discussed below and are based on when they will occur during the approximate five year construction cycle. Initial construction activities for the proposed project are expected to begin in the third quarter of 2016 and are expected to be completed by second quarter of 2021, based on preliminary project engineering. The preliminary construction schedule timing and duration for each component of the proposed project varies. The construction period when the most number of construction equipment and activities of the proposed project are expected to overlap is expected to occur in the first three years (peak construction period). Construction work shifts are expected to last about ten hours per day during most portions of the overall construction schedule. During normal construction periods, one work shift per day, five days per week is expected. During Refinery turnaround periods (when some of the Refinery Units are shut down), two work shifts are expected and work may be conducted 24 hours per day, seven days per week. Shifts would operate from 6:00 a.m. to 6:00 p.m. and 6:00 p.m. to 6:00 a.m. The traffic analysis presented below assumes that at least one Refinery turnaround will occur during the peak construction period to provide a conservative analysis of traffic impacts.

Although construction-related traffic is considered to be temporary in nature, i.e., ends after a proposed project becomes operational, a detailed analysis of construction period traffic impacts was conducted for the proposed project due to two factors:

1. The proposed project is expected to require a large number of workers and, therefore, could generate a large number of worker trips compared to typical development projects in southern California, and

2. The Interstate 405/Wilmington Avenue interchange is currently under construction. Caltrans estimates that construction at this interchange would be complete by early 2017. The baseline for the traffic analysis for the proposed project assumes that the Interstate 405/Wilmington Avenue interchange is in its preconstruction configuration. Construction of the Interstate 405/Wilmington Avenue interchange could overlap with the first phase of the proposed project construction. In order to provide a conservative analysis and because construction schedules can change, the traffic analysis of the peak construction period for the proposed project assumes that construction of the Interstate 405/Wilmington Avenue Interchange would not be complete and would be under construction during peak construction of the proposed project.

For these reasons, detailed analyses of construction period traffic impacts were conducted to identify potential significant impacts and because traffic impacts at one roadway segment were concluded to be significant, construction period traffic management strategies are required to mitigate those impacts.

4.7.2.1 Construction Traffic

Baseline conditions were obtained from turning movement traffic counts taken in August 2014 during the a.m. and p.m. peak hours of operation. The baseline trip estimates include trips to and from the Refinery and the parking lots to be used for the proposed project. Based on the traffic counts at the Refinery and parking lot driveways, there are a total of 1,060 daily round trips: 135 daily round trips from the 223rd Street parking lot, 912 daily round trips from the Alameda street parking lot, and 265 daily round trips from the Sepulveda Boulevard parking lot.

Construction traffic conditions are analyzed for the construction phase having the maximum number of construction trips (peak construction period) over the entire construction period. The traffic analysis is based on the preliminary construction schedule that included a total of 950 workers, 875 day shift workers and 75 night shift workers. The peak construction period trip generation is shown below in Table 4.7-1. Following the traffic study, the construction schedule has been refined and the number of workers has decreased. The decrease in total trips is within the margin of accuracy and using the original traffic estimate of 950 construction workers provides a worst-case estimate of traffic estimates. In total, 696 workers will travel to and from the proposed project site during the highest trip-generation phase of construction of the proposed project (i.e., during Month 15). In addition to worker trips, 120 truck trips would be generated during the peak trip-generating construction phase throughout the work day. This traffic analysis that considers a higher number of trips, provides a conservative "worst-case" impact analysis.

TABLE 4.7-1

Construction Period Daily Trip Generation

Type	Work Shift	Total Round Trips	Total One-Way Trips
Supervisors	6 a.m.–5:30 p.m.	40	80
Workers	7:00 a.m.–5:30 p.m.	835	1,670
Workers	7:00 p.m.–7:00 a.m.	75	150
Trucks	Throughout the day	120	240
Total		**1,070**	**2,140**

Given the work shift hours for each type of worker, the following peak hour trip generation assumptions were made for this study:

- Peak morning hours are from 6:00 a.m. to 9:00 ~~p.m.~~ a.m.
- Peak evening hours are from 4:00 p.m. to 6:00 p.m.
- Supervisors would arrive before the a.m. peak hour and 50 percent would leave in the p.m. peak hour (40 supervisors x 50 percent x 10 percent carpool = 18 outbound p.m. peak hour trips).
- 50 percent of day shift workers would arrive during the a.m. peak hour and 50 percent would leave in the p.m. peak hour (835 workers x 50 percent x 10 percent carpool = 376 inbound trips in the a.m. peak hour and 376 outbound trips in the p.m. peak hour).
- 50 percent of night shift workers would leave in the a.m. peak hour and 50 percent would arrive in the p.m. peak hour (75 workers x 50 percent x 10 percent carpool = 34 inbound trips in the a.m. peak hour and 34 outbound trips in the p.m. peak hour).
- An average vehicle ridership (AVR) of 1.1, that is, 90 percent of the construction workers were assumed to drive to work alone.
- Truck trips are distributed evenly throughout the ten hour work day with 12 inbound and 12 outbound trips per peak hour. A passenger car equivalency (PCE) factor of 2.0 is applied to the truck trips to account for their larger size and slower turning speeds at intersections (120 trucks over 10 hours = 12 trucks per hour x 2.0 PCE = 24 PCE truck trips per hour inbound and outbound).

Of the 2,140 total daily one-way construction-related trips shown in Table 4.7-1, the number of PCE trips occurring in the peak hours are forecasted to be 458 PCE in the a.m. peak hour period, and 476 PCE trips in the p.m. peak hour period as shown in Table 4.7-2.

TABLE 4.7-2

Construction Period Peak Hour Trip Generation

Type	A.M. Peak Hour			P.M. Peak Hour		
	In	Out	Total	In	Out	Total
Auto	376	34	410	34	394	428
Truck (PCE)	24	24	48	24	24	48
Total	**400**	**58**	**458**	**58**	**418**	**476**

Trip distribution assumptions were used to determine the origin and destination of new vehicle trips associated with the proposed project. Trip distribution for the construction worker trips of the proposed project was developed using the weighted distribution of workers, from the 2010 U.S. Census, in Los Angeles, Orange, Riverside, and San Bernardino counties via the arterial network to cities near the study area (e.g. Carson, Compton, Long Beach, portions of Los Angeles, and Torrance) and the regional freeway network for cities more than two miles from the proposed project site.

Distribution of construction worker trips was 30 percent from Interstate 405 north of the proposed project site, 25 percent from Interstate 405 south of the proposed project site, 30 percent from Interstate 710 north of the proposed project site and 15 percent from local access along arterials. Truck trip distribution was assumed to occur to/from the north along Interstate 710 (see Appendix E for further details).

The LOS analysis was conducted to evaluate baseline LOS conditions at affected intersections compared to those same intersections with construction worker traffic during the a.m. and p.m. peak hours. Table 4.7-3 summarizes the LOS analysis results at the study intersections, which show that at one intersection construction worker traffic would contribute to an exceedance of a threshold of significance.

A major construction project at the Interstate 405/Wilmington Avenue interchange to modify the interchange started in November 2013, and is expected to be completed in late 2016 or early 2017. The Interstate 405/Wilmington Avenue interchange project includes reconfiguring existing on- and off-ramps from northbound and southbound Interstate 405, constructing a new on-ramp to southbound Interstate 405, reconstructing Wilmington Avenue and Lenardo Drive, and constructing a new bridge over the Torrance Lateral Channel. The Interstate 405/Wilmington Avenue Interchange project started before construction of the proposed project is to begin, i.e., during the baseline traffic conditions, and is expected to potentially overlap with the near-term construction period of the proposed project. Further, according to the traffic study, construction activities of the Interstate 405/Wilmington Avenue interchange project did not change the number of lanes provided by the interchange.

TABLE 4.7-3

Existing Plus Construction Period Conditions Intersection LOS

Intersection		Existing Conditions						Existing Plus Construction Conditions						A.M. Change in V/C or Delay	P.M. Change in V/C or Delay	Significant Impact?
		A.M. Peak Hour			P.M. Peak Hour			A.M. Peak Hour			P.M. Peak Hour					
		V/C Ratio	Delay (sec)	LOS	V/C Ratio	Delay (sec)	LOS	V/C Ratio	Delay (sec)	LOS	V/C Ratio	Delay (sec)	LOS			
1	Wilmington Ave/Interstate 405 NB Ramps	0.499	21.4	C	0.395	18.5	B	0.500	21.5	C	0.395	18.6	B	0.1 s	0.1 s	No
2	Wilmington Ave/Interstate 405 SB Ramps	0.355	44.2	D	0.629	15.7	B	0.439	57.9	E	0.641	16.5	B	13.7 s	0.8 s	**Yes[(a)]**
3	Wilmington Ave/223rd St	0.643	-	B	0.690	-	B	0.653	-	B	0.696	-	B	0.010	0.006	No
4	Alameda St./Interstate 405 NB Ramps	0.690	21.2	C	0.665	23.2	C	0.807	25.6	C	0.683	23.8	C	4.4 s	0.6 s	No
5	Alameda St./223rd St (along Alameda St.)	0.460	-	A	0.570	-	A	0.484	-	A	0.604	-	B	0.024	0.034	No
6	Alameda St./223rd St (along 223rd St)	0.349	-	A	0.634	-	B	0.358	-	A	0.696	-	B	0.009	0.062	No
7	Alameda St./Sepulveda Blvd (along Alameda St.)	0.374	-	A	0.537	-	A	0.406	-	A	0.552	-	A	0.032	0.015	No
8	Alameda St./Sepulveda Blvd (along Sepulveda Blvd)	0.415	-	A	0.742	-	C	0.452	-	A	0.751	-	C	0.037	0.009	No
9	Interstate 405 SB Ramps/223rd St	0.472	23.4	C	0.327	24.3	C	0.502	24.6	C	0.395	23.7	C	1.2 s	-0.6 s	No
10	Terminal Island Fwy (SR-103)/Sepulveda Blvd	0.390	-	A	0.579	-	A	0.421	-	A	0.595	-	A	0.031	0.016	No
11	Santa Fe Ave/Sepulveda Blvd	0.624	-	B	0.781	-	C	0.654	-	C	0.798	-	C	0.030	0.017	No
12	Interstate 710 SB Ramps/Willow St	Uncontrolled Intersection														No
13	Interstate 710 NB Ramps/Willow St	Uncontrolled Intersection														No

(a) = Significant temporary impact based on LOS E operation with the addition of construction-related trips.
Notes:
V/C = Volume to Capacity Ratio, LOS = Level of Service, Delay = Average Vehicle Delay (Seconds), s = seconds

The construction of the Interstate 405/Wilmington Avenue Interchange will have periodic lane and ramp closures that, while temporary, has the potential to affect the proposed project-related construction trips' interaction with the roadway network and demand placed on study intersections. This analysis includes the construction period analysis of the proposed project at the beginning of the construction of the Interstate 405/Wilmington Avenue Interchange (baseline conditions) in its pre-construction configuration in Table 4.7-3.

As shown in Table 4.7-3, the LOS at all intersections is expected to be LOS A, B or C, except Interstate 405/Wilmington Avenue Southbound Ramps during the morning peak hour. The construction-related trips are forecast to result in a significant impact during construction of the proposed project at the Interstate 405/Wilmington Avenue Southbound Ramps under their pre-construction configuration of the freeway ramps. This is due to the large number of project-related trips utilizing the southbound ramp to access the proposed project site in the a.m. peak hour.

It should be emphasized that the significant adverse impacts at the Interstate 405/Wilmington Avenue Southbound Ramps during the morning peak hour are temporary in nature and terminate once construction of the interchange has been completed, which is expected to occur early 201~~6~~7. The analysis indicates that inbound trips to the proposed project during the construction period should avoid the Interstate 405/Wilmington Avenue interchange while it is under construction. Once the construction phase of the proposed project is completed, potential traffic impacts at the Interstate 405/Wilmington Avenue interchange would no longer be significant and, therefore, mitigation by the applicant would no longer be required.

The proposed project is not expected to conflict with applicable policies, plans or programs as the increase in traffic is limited to the construction period, traffic impacts will be temporary, and traffic impacts will cease following peak construction activities. Construction activities would not require the closure of any major roadway for any period of time as all construction activities will occur within the confines of the existing Refinery, with the exception of the Interconnecting Pipelines. The portion of the Interconnecting Pipeline that is outside of the Refinery boundaries will be bored underneath Alameda Street and Sepulveda Boulevard. Therefore, no road closures are expected due to the construction of the proposed project.

Finally, construction activities will increase the demand for parking as an estimated 950 construction workers would be required during peak construction activities. As shown on Figure 2-19, sufficient parking for the construction workers exists within and adjacent to the existing Refinery. Therefore, no significant impact due to increase parking is associated with construction of the proposed project. Following construction, no increase in the number of workers required to operate the Refinery is expected. Therefore, there would be no long-term parking impacts associated with the proposed project.

4.7.3 MITIGATION MEASURES

Mitigation measures are required in order to reduce the proposed project's construction-related trips on the Interstate 405/Wilmington Avenue Southbound Ramps intersection prior to the completion of the Interstate 405/Wilmington Avenue Interchange project. Therefore, the following mitigation measure will be imposed.

TT-1: The applicant will be required to implement a traffic management plan to address significant adverse construction traffic impacts generated by the proposed project prior to the completion of the improvements at the Interstate 405/Wilmington Avenue Southbound Ramps intersection. The traffic plan will require that project workers be advised of the construction schedule and potential restrictions and closures associated with the Interstate 405/Wilmington Ave. Interchange project and will be required to avoid the Interstate 405/Wilmington Avenue Southbound Ramps intersection during morning peak travel periods by traveling either outside of the morning peak travel time or along alternative routes. Additionally, construction workers shall be encouraged to participate in ridesharing to lessen the number of vehicles transiting to the Refinery. The protocols for the dissemination of information to proposed project workers and potential alternative schedules or routing during construction activities for the proposed project will be provided in the traffic management plan. The requirement to avoid the Interstate 405/Wilmington Avenue Southbound Ramps intersection will be included as a provision in the construction contracts of all construction contractors.

As shown in Table 4.7-3, traffic conditions with the proposed project at all other study locations are expected to be rated LOS C or better during peak a.m. and p.m. traffic hours. As a result, it is anticipated that using the most likely alternative routes to the Refinery during the peak construction phase for the proposed project will not create significant adverse traffic impacts at the alternative route intersections.

4.7.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The impacts of the proposed project on traffic and circulation are expected to be less than significant following implementation of mitigation measure TT-1 because most, if not all, construction worker trips will be required to avoid the Interstate 405/Wilmington Avenue Southbound Ramps intersection while it is under construction.

4.8 SIGNIFICANT AND UNAVOIDABLE ADVERSE IMPACTS

CEQA requires an EIR to discuss significant environmental effects (CEQA Guidelines §15126.2(b)) and irreversible environmental changes (CEQA Guidelines §15126.2(c)), which would result from a proposed project, should it be implemented. Significant environmental impacts are impacts that would exceed established significance threshold levels (e.g., air pollutant emissions during proposed project construction would exceed SCAQMD established significance threshold levels and remain significant after implementing mitigation measures). Irreversible changes include a large commitment of nonrenewable resources, committing future generations to specific uses of the environment (e.g., converting open spaces into urban development), or enduring environmental damage due to an accident.

It was determined that implementation of the proposed project would result in potentially significant adverse VOC and NOx impacts on air quality during construction and exceed the localized significance thresholds for NO_2 during construction. Significant construction emissions are temporary and will cease following completion of construction activities. Operational air quality impacts of criteria pollutants will be a beneficial reduction for CO, and less than significant impacts for VOC, NOx, SOx, PM10, PM2.5 and TACs, and thus are not expected to have a significant adverse impact on the environment. Following completion of the construction phase, the proposed project is expected to result in a local benefit to air quality. Therefore, the proposed project is not expected to have long-term adverse environmental impacts on air quality.

The proposed project could result in significant adverse hazard impacts related to "worst case" accidental releases of hazardous materials associated with the proposed modifications to the Naphtha Isomerization Unit, the proposed new crude tanks, SARP, and Interconnecting Pipelines. Compliance with existing PSM, RMP, and CalARP regulations and compliance with the mitigation measure imposed would minimize the potential impacts associated with a release, but are not expected to eliminate the potentially significant adverse hazard impacts.

Traffic levels are expected to increase during the construction phase and generate potentially significant adverse traffic impacts. Feasible mitigation measures were identified and are expected to reduce significant adverse traffic impacts to less than significant. Since the proposed project is not expected to require new employees, operational traffic levels are expected to remain essentially the same as existing levels. Therefore, no significant adverse impacts for traffic are expected during operation of the proposed project.

The proposed project involves modifications to an existing Refinery, located within an industrial area, which has been operating since the early 1900s. Therefore, since the Refinery would continue to refine crude oil into useful, marketable products there will be no major commitment of nonrenewable resources or changes that would commit future generations to specific uses of the environment associated with the proposed project.

4.9 GROWTH INDUCING IMPACTS

4.9.1 INTRODUCTION

CEQA defines growth-inducing impacts as those impacts of a proposed project that "could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects, which would remove obstacles to population growth" (CEQA Guidelines §15126.2(d)).

To address this issue, potential growth-inducing effects are examined through the following considerations:

- Facilitation of economic effects that could result in other activities that could significantly affect the environment;
- Expansion requirements for one or more public services to maintain desired levels of service as a result of the proposed project;
- Removal of obstacles to growth, e.g., through the construction or extension of major infrastructure facilities that do not presently exist in the project area or through changes in existing regulations pertaining to land development;
- Adding development or encroachment into open space; and/or
- Setting a precedent that could encourage and facilitate other activities that could significantly affect the environment.

4.9.2 ECONOMIC AND POPULATION GROWTH, AND RELATED PUBLIC SERVICES

The proposed project would not directly or indirectly foster economic or population growth or the construction of new housing in the southern California area. Although the proposed project involves a construction project within an existing industrial area, it would not directly or indirectly stimulate substantial population growth, remove obstacles to population growth, or necessitate the construction of new community facilities that would lead to additional growth in the surrounding area.

A project would directly induce growth if it would directly foster economic or population growth or the construction of new housing in the surrounding environment (e.g., if it would remove an obstacle to growth by expanding existing infrastructure). The proposed project would not remove barriers to population growth, as it involves no changes to General Plan, zoning ordinance, or related land use policy. The proposed project does not include the development of new housing or population-generating uses or infrastructure that would directly encourage such uses. The residential areas in the immediate vicinity of the proposed project (Carson, Wilmington and Long Beach) are built out. Therefore, the proposed project would not directly trigger new residential development in the area.

The proposed project would temporarily contribute to regional employment, requiring employees for construction activities at the Refinery. The construction work force is expected to require a maximum of 696 construction workers. It is expected that construction workers will be largely drawn from the existing workforce pool in southern California. Considering the existing workforce in the region (over five million workers) and current unemployment rates (about 5.9 percent) (EDD 2016), it is expected that a sufficient number of workers are available locally and that few or no workers would relocate for temporary construction jobs created by the proposed project.

Operation of the proposed project is not expected to create any additional jobs, as it involves the modifications to the Tesoro Los Angeles Refinery to more fully integrate the Wilmington Operations and Carson Operations. Further, the proposed project would not be expected to result in an increase in local population, housing, or associated public services (e.g. fire, police, schools, recreation, and library facilities) since no increase in the permanent number of Refinery workers is expected. Likewise, the proposed project would not create new demand for secondary services, including regional or specialty retail, restaurant or food delivery, recreation, or entertainment uses. As discussed in the NOP/IS (see Appendix A), implementation of the proposed project would not increase the demand for wastewater treatment facilities, electricity, solid waste disposal capacity, or natural gas. As such, the proposed project would not foster economic or population growth in the surrounding area in a manner that would be growth-inducing.

4.9.3 REMOVAL OF OBSTACLES TO GROWTH

The proposed project is located within an existing Refinery where adequate infrastructure is already in place to serve the existing Refinery and existing surrounding population. The proposed project would more fully integrate the Wilmington Operations and Carson Operations to more efficiently operate the Tesoro Los Angeles Refinery. As such, the proposed project would help ensure the continued reliable supply of petroleum products in an area that historically has been used for refinery and other related operations. The proposed project could result in an increase in the import or refining of about 6,000 bbl/day of crude oil, but would not result in a substantial increase in the production of petroleum products (e.g., gasoline and diesel fuels) to allow significant population growth.

The proposed project would not employ activities or uses that would result in growth inducement, such as the development of new infrastructure (e.g., new roadway access or utilities) that would directly or indirectly cause the growth of new populations, communities, or currently undeveloped areas. Likewise, the proposed project would not result in an expansion of existing public service facilities (e.g., police, fire, libraries, and schools) or the development of public service facilities that do not already exist.

4.9.4 DEVELOPMENT OR ENCROACHMENTS INTO OPEN SPACE

Development can be considered growth-inducing when it is not contiguous to existing urban development and introduces development into open space areas. The proposed project is situated within an existing Refinery in a heavy industrial, urbanized area that is currently developed. The proposed project would not result in development within or encroachment into an open space area.

4.9.5 PRECEDENT SETTING ACTION

The proposed project will require permits and other regulatory approvals from state, federal, and local agencies. For construction and operation of the proposed project, permits and approvals from a number of agencies are required including: (1) a Title V permit issued by the SCAQMD; (2) permits to construct/operate from the SCAQMD; (3) CalOSHA construction-related permits; (4) encroachment permits from the Alameda Corridor Transportation Authority; (5) building and related permits from the Cities of Carson and Los Angeles; and (6) conditional use permit from the City of Carson for the new crude tanks. These required approvals are routine permit actions and would not result in precedent-setting actions that might cause significant environmental impacts beyond what was evaluated in this EIR.

4.9.6 CONCLUSION

The proposed project would help ensure the efficient manufacture of petroleum products at an existing Refinery that has been used for refining purposes since the early 1900s. As a development project occurring in an urban, industrialized, and generally built-out environment, the proposed project would increase long-term stability and the availability of petroleum products. However, the proposed project would not be considered growth-inducing, because it would not result in an increase in production of resources or cause a progression of growth that could significantly affect the environment either individually or cumulatively.

4.10 ENVIRONMENTAL EFFECTS FOUND NOT TO BE SIGNIFICANT

The environmental effects of the proposed project that may have potentially significant adverse effects on the environment are identified, evaluated, and discussed in detail in the preceding portions of Chapter 4 of this EIR and in the Initial Study (see Appendix A) per the requirements of the CEQA Guidelines (§§15126(a) and 15126.2). The potentially significant adverse environmental impacts as determined by the Initial Study (see Appendix A) include: air quality and greenhouse gas emissions; hazards and hazardous materials; hydrology and water quality; noise; solid and hazardous waste; and transportation and traffic. The analysis provided in the Initial Study has concluded that the following environmental topics would be less than significant: aesthetics; agriculture and forestry resources, biological resources, cultural resources; energy; geology and soils; land use and planning; mineral resources; population and housing; public services and recreation.

The reasons for finding the environmental resources to be less than significant are explained below. No comments were received on the NOP/IS that disputed the conclusions that the impacts from the proposed project discussed in this section would be less than significant.

4.10.1 AESTHETICS

The proposed project will be located in the Wilmington District of the City of Los Angeles and the southeastern portion of the City of Carson within Los Angeles County. The proposed project is located in an existing industrial facility. The proposed project site currently consists of the Refinery (which includes both the Wilmington and Carson Operations), as well as a sulfur recovery plant and crude storage terminal. Except for pipeline and electrical intertie construction, all project activities are expected to take place within the boundaries of the proposed project site.

The area of the proposed project is zoned as an industrial area. Once completed, the proposed project configuration will not appear substantially different than the existing Refinery configuration that is currently located at the proposed project site. There are no scenic vistas in the vicinity of the proposed project. Therefore, the proposed project will not change any scenic vistas. No scenic resources are present within the existing facilities. Therefore, the proposed project will not have substantial adverse effects on scenic vistas or scenic resources.

New structures at the Wilmington Operations would range in height from about 70 to 125 feet tall and will be located within the operating portions of the existing Refinery. Within the confines of the Wilmington Operations, other nearby existing structures which are not part of the proposed project range from 90 to 150 feet tall. New structures at the Carson Operations would range in height from about 40 to 120 feet tall. Within the confines of the Carson Operations, other nearby existing structures which are not part of the proposed project range from about 50 to 180 feet tall. Although the proposed project includes some structures that are higher than existing adjacent units, the overall visual characteristics of the integrated Refinery are expected to be the same or similar to the existing configuration at the Refinery. Further, installation of new or replacement of existing equipment at the facility, either inside or outside the existing structures, would not appreciably change the visual profile of the entire facility.

In general, construction activities for the proposed project are not anticipated to require additional lighting because they are scheduled to take place primarily during daylight hours. However, when daylight hours are limited (i.e., winter months), or during Refinery turnarounds (when construction activities could occur 24-hours per day), temporary lighting may be required. Any additional lighting would be focused on the construction area and aimed toward the Refinery operations. Since the proposed project would be located within the boundaries of the existing Refinery, additional temporary lighting, if needed, is not expected to be discernible from the existing permanent night lighting already associated with Refinery operations.

New permanent lighting may be provided as necessary in accordance with applicable safety standards on new structures constructed as a result of the proposed project. If any new lighting is installed, it is expected to be consistent with existing lighting at the Refinery, and, therefore, not noticeable outside the integrated Refinery boundaries.

4.10.2 AGRICULTURE AND FORESTRY RESOURCES

Except for the Interconnecting Pipelines and electrical intertie construction, the proposed project would not involve construction or operation outside of the existing boundaries of the integrated Refinery. The proposed project would be consistent with the heavy industrial zoning requirements for the integrated Refinery and the Carson Crude Terminal. No agricultural or forestry resources or operations, including Williamson Act contracts, are located within or near the boundaries of the Wilmington or Carson Operations. No agriculture or forestry resources would be adversely affected by construction or operation activities from the proposed project because it would be implemented within the existing Refinery or other adjacent industrial areas (e.g., Alameda Corridor) and adjacent industrial areas that support Carson and Wilmington Operations and do not include agricultural resources. Therefore, the proposed project would not result in any new construction of buildings or other structures that would convert farmland to non-agricultural use or conflict with zoning for agricultural use or a Williamson Act contract.

Since the proposed project would occur within or immediately adjacent to the boundaries of the Wilmington and Carson Operations, there are no provisions of the proposed project that would affect land use plans, policies, or regulations related to agricultural or forestry resources. Land use and other planning considerations are determined by local governments and no land use or planning requirements relative to agricultural resources will be altered by the proposed project. For these same reasons, the proposed project would not result in the loss of forest land or conversion of forest land to non-forest use.

4.10.3 BIOLOGICAL RESOURCES

The proposed project would be located in a heavy industrial zoned area and, with the exception of the Interconnecting Pipelines and electrical intertie construction, would be within the boundaries of the existing Refinery. The facilities and surrounding areas have been fully developed and are essentially devoid of vegetation and wildlife. Vegetation on-site or near each affected area has been eliminated for fire prevention purposes with the exception of landscape vegetation near the administration buildings. Because there is no native vegetation in the vicinity of the proposed project, project construction activities would not impact rare, endangered, or threatened species. The proposed pipeline will be tunneled under existing streets which are devoid of vegetation. The proposed project would not adversely affect federally protected wetlands as defined in §404 of the Clean Water Act, as none are located within the proposed project area. Therefore, no significant adverse impacts on biological resources are expected.

4.10.4 CULTURAL RESOURCES

The buildings, structures, and equipment associated with the proposed project are not listed on registers of historic resources, and do not meet any of the eligibility criteria as cultural resources (e.g., associated with historically important events or people, embodying distinctive characteristics of a type, period, or method of construction), and would not be likely to yield historically important information. The only components of the proposed project that are being removed are old Refinery structures including columns, fans, towers, heat exchangers, pumps, etc. None of these structures meet historical significance criteria. Therefore, no significant adverse impacts to historic cultural resources are expected as a result of implementing the proposed project.

The entire active portions of the Wilmington and Carson Operations have been previously graded and developed. Proposed project activities will occur in areas of the integrated Refinery and Carson Crude Terminal where the ground surface has already been disturbed, within or adjacent to existing refining and other units, and this past disturbance reduces the likelihood that previously unknown cultural resources will be encountered. Further, the Refinery site does not contain known paleontological resources and thus the proposed project also is not expected to impact any sites of paleontological value. However, as required by State law, if human remains are unearthed, no further disturbance will occur until the County Coroner has made the necessary findings concerning the origin and disposition of these remains. The Native American Heritage Commission will be notified if the remains are determined to be of Native American descent.

The proposed project will not cause significant adverse impacts to cultural resources; therefore, impacts on cultural resources are expected to be less than significant.

During the public comment period for the DEIR, the SCAQMD consulted with the Tribal Administrator of the Tongva Ancestral Territorial Tribal Nation. No issues were raised that would change the conclusion in the NOP/IS that impacts on cultural resources are considered less than significant.

4.10.5 ENERGY

4.10.5.1 Electricity

The proposed project is not expected to conflict with any adopted energy conservation plan or existing energy standard. There are no known energy conservation plans or existing energy standards that would apply to either of the existing Wilmington and Carson Operations or the proposed project as it primarily involves new and modified equipment that will allow the Refinery to operate more efficiently. The FCCU at Wilmington Operations will be shut down, reducing the energy requirements in this portion of the integrated Refinery. Heat exchangers will be added to a number of units to increase overall energy recovery efficiency. The potential additional energy demand that may be needed to implement proposed project construction and operational activities was determined to be less than significant in the NOP/IS and no public comments disputed this conclusion.

Since completion of the NOP/IS additional engineering design and information has been completed and there is a better understanding of the proposed project's electricity requirements. Table 4.10-1 provides estimates of the electricity requirements associated with the proposed project and augments information provided in the NOP/IS (see Table 4.10-1.)

As shown in Table 4.10-1, the proposed project would result in an increase in horsepower associated with new/modified equipment and, therefore, result in an increase in electricity requirements at the Carson Operations. Electricity for the Carson Operations is provided by the existing Watson Cogeneration Facility. The Watson Cogeneration Facility currently produces excess electricity that it sells to Southern California Edison. Under the proposed project, the amount of electricity that would be sold would be reduced and used to provide the electricity requirements associated with the proposed project. Therefore, as concluded in the NOP/IS, no significant adverse impacts on electricity production would be expected due to operation of the proposed project.

TABLE 4.10-1

Proposed Project Electricity Use

Unit	Equipment	Motor Horsepower	Spare Motor Horsepower[(a)]
Direct Components			
Wilmington FCCU Shutdown	C-142 Shutdown	-6,500	
Wilmington FCCU Shutdown	Precipitators Shutdown	-1,300	
Wilmington HCU – 1st Stage	Charge Pump – Additional Motor	250	
Wilmington HCU – 1st Stage	Fractionator Bottom Pumps	200	
Wilmington HCU – 1st Stage	Booster Pump	12	

TABLE 4.10-1(concluded)

Unit	Equipment	Motor Horsepower	Spare Motor Horsepower[(a)]
Wilmington HTU-4 Heat Integration	DGO Booster Pumps	150	150
Wilmington HTU-1	Booster Pump	100	100
SARP	Main Compressor	1,200	1,200
SARP	Blower	215	80
SARP	Pumps	350	140
SARP	Air Coolers	150	
SARP	Miscellaneous	100	50
Wilmington 300M Crude Storage Tanks	Mixers	120	
Wilmington 300M Crude Storage Tanks	Crude Booster Pump	450	
Wilmington PSTU	Pumps	223	203
Carson Stabilizer Reboiler	Jet Cut Tower Bottoms Pumps	10	10
Carson NHDS	Feed Pump	300	
Carson NHDS	Reflux Pumps	60	
Carson NHDS	Bottom Pumps	100	100
Carson No.51 Vacuum Unit	Diesel Product Pumps	600	
Carson Alkylation Unit	Current Pumps	-15	-15
Carson Alkylation Unit	New Pumps	50	50
Carson Hydrocracker	BUX Air Cooler	20	
Carson Steam Production	No.2 Crude Unit Charge Pump	600	
Carson Steam Production	No.7 Cooling Tower Pump	500	
Carson Steam Production	No.9 Cooling Tower Pump	750	
Carson LPG Railcar Unloading	Unloading Pumps	50	
Carson Wet Jet Treater	Pumps	200	200
Carson Crude Crude Tanks	500M Tanks Mixers	720	
Carson Crude Crude Tanks	Transfer Pumps	450	
Interconnecting Pipelines	Line 4 – Transfer Pump (W)	100	
	Line 7 – Propylene (C)	40	40
Subtotal, Direct Components		**255**	**2,308**
	Indirect Components		
H-100 Downstream Impacts	Various equipment	1,428	--
Subtotal, Indirect Components		**1,428**	**--**
TOTAL PROPOSED PROJECT		**1,683**	**2,308**

(a) Some modifications include the installation of spare equipment. If the main equipment fails, the spare equipment would take over operations. Note that the main equipment and spare equipment would not operate at the same time.

4.10.5.2 Fuels

With the exception of electric welders, compressors and distribution panels for tools, it is not expected that natural gas-fired or electrically-powered construction equipment would be used; thus, there would be no need for new or substantially altered power or natural gas utility systems during construction of the proposed project. As evaluated in the NOP/IS, construction of the proposed project is estimated to require about 64,000 gallons of diesel fuel per year. In 2011, the Los Angeles region used 4,892 million gallons of gasoline and 281 million gallons of diesel. The fuel associated with construction of the entire project represents less than one percent of the total annual demand in the Los Angeles region, is a negligible fraction of the total use of fuel in California, and is not considered to be a wasteful use of fuel. The construction activities are not expected to result in an increase in gasoline consumption as the construction equipment is predominately diesel fueled. Therefore, less than significant adverse energy impacts are expected during the construction period. Additionally, no permanent employees are anticipated to be needed to operate the Refinery once construction is completed, so no additional demand for gasoline fuel is expected.

No significant adverse impacts to energy resources are expected to occur as a result of construction and operational activities that Tesoro would undertake in order to complete the proposed project. Similarly, the proposed project would not utilize non-renewable energy resources in a wasteful or inefficient manner. Therefore, no potentially significant adverse energy impacts were identified.

4.10.6 GEOLOGY AND SOILS

The proposed project is located within a seismically active region. The most significant potential geologic hazard is estimated to be seismic shaking from future earthquakes generated by active or potentially active faults in the region. Past experience indicates that there has not been any substantial damage, structural or otherwise to the Wilmington and Carson Operations as a result of earthquakes.

No faults or fault-related features are known to exist at the Refinery. The closest fault zone to the Refinery is the Newport-Inglewood Fault Zone, which is located approximately 1.5 to 2.0 miles northeast of the Refinery. The proposed project is not located on any Alquist-Priolo Earthquake fault zone and is not expected to be subject to significant surface fault displacement. Therefore, no significant adverse impacts to the proposed project facilities are expected from seismically-induced ground rupture.

The new and modified equipment must be designed to comply with the California Building Code requirements since the proposed project is located in a seismically active area. The California Building Code is considered to be a standard safeguard against major structural failures and loss of life. The California Building Code requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes.

The new and modified equipment at the Refinery will require building permits, as applicable, for all new structures associated with the proposed project from the City of Los Angeles and the City of Carson. The issuance of building permits from the local authority will assure compliance with the California Building Code requirements which include requirements for building within seismic hazard zones. No significant adverse impacts from seismic hazards are expected since the proposed project will be required to comply with the California Building Codes, including those addressing seismic effects.

Thus, the proposed project would not alter the exposure of people or property to geological hazards such as earthquakes, landslides, mudslides, ground failure, or other natural hazards. As a result, substantial exposure of people or structures to the risk of loss, injury, or death involving the rupture of an earthquake fault, seismic ground shaking, ground failure or landslides is not anticipated.

4.10.7 LAND USE AND PLANNING

The construction and operation of the proposed project will occur primarily within the confines of the existing Wilmington and Carson Operations, except for the Interconnecting Pipelines and electrical intertie construction, which would be routed underneath Alameda Street and Sepulveda Boulevard and the electrical conduit that would be routed over Alameda Street. As a result, no component of the proposed project would result in physically dividing any established communities, but will continue the use of the site as a Refinery.

All land uses in the vicinity of the proposed project are existing industrial areas, which are zoned for heavy industrial use. The proposed project is consistent with the heavy industrial land use designation of the Refinery and no land use or planning requirements will be altered by adoption of the proposed project. Therefore, present or planned land uses in the region will not be affected as a result of the proposed project. Based upon the above considerations, significant adverse land use planning impacts are not expected from the implementation of the proposed project.

4.10.8 MINERAL RESOURCES

Construction and operation of the proposed project would occur entirely within the boundaries of the existing Refinery and adjacent industrial areas, all of which are zoned heavy industrial. The California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR) keeps records of oil wells and oil fields in California. According to the DOGGR online data, there are no oil wells (active or abandoned) located within the confines of the proposed project. The nearest oil and gas wells are located adjacent to the southwestern property line and are either idle or abandoned wells in the Wilmington Oil Field. Thus, the proposed project would not affect the availability of known crude oil or other mineral resources (no other known mineral resources are expected to be required for the proposed project).

There are no provisions of the proposed project that would result in the loss of availability of a known mineral resource of value to the region and the residents of the State of California such as aggregate, coal, clay, shale, etc., or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

4.10.9 POPULATION AND HOUSING

Construction and operational activities associated with the proposed project are not expected to involve the relocation of individuals, adversely impact housing or commercial facilities, or change the distribution of the population in the region because the proposed project will occur completely within existing industrial facilities and no housing is located within the industrial areas. It is estimated that as many as 696 construction workers are expected to be needed during peak construction activities and most of the workers are expected to come from the large labor pool in southern California (over five million workers). No increase in the permanent number of workers at the Tesoro Los Angeles Refinery is expected following the construction phase. Human population within the jurisdiction of the SCAQMD is anticipated to grow regardless of implementing the proposed project. As a result, the proposed project is not anticipated to generate any significant adverse effects, either direct or indirect, on population growth or distribution within the district.

Operation of the proposed project is not expected to require additional workers. As a result, the proposed project is not expected to result in the creation of any industry that would affect population growth, directly or indirectly induce the construction of single- or multiple-family units, or require the displacement of people or housing elsewhere in the district.

4.10.10 PUBLIC SERVICES

To respond to emergency situations, both the Wilmington and Carson Operations maintain on-site fire departments, which are supplemented by the resources of public fire departments. Both Operations are supported by the Los Angeles County Fire Department (LACFD) and City of Los Angeles Fire Department (City Fire). There are four LACFD stations (all located within the City of Carson) and one City Fire station in Wilmington that serve the proposed project area.

During construction, monitoring for hazards with equipment designed to detect sources of flammable gases and vapors, written procedures, training, and authorization of equipment used on-site will be in place. Construction activities are not expected to result in an increased need for fire response services or affect service ratios or other performance objectives.

Both the Wilmington and Carson Operations maintain their own emergency response teams to respond to emergencies. Each Operation maintains fully trained 24-hour emergency response team and equipment to protect against flammable and combustible materials. The proposed project is not expected to increase the need or demand for additional services from the fire department above current levels because on-site firefighting and emergency response capabilities and personnel will be maintained and are expected to be able to continue to respond to potential emergencies in the future, while maintaining acceptable service ratios, response times, or other performance objectives.

The Los Angeles City Police Department and the Los Angeles County Sheriff's Department are the responding agencies for law enforcement needs in the vicinity of the Wilmington and Carson Operations. Because the sheriff and police departments typically have units that are in the field, response times to the Refinery currently vary depending on the location of the nearest unit.

The existing Wilmington and Carson Operations have security departments that provide 24-hour protective services for people and property within the fenced boundaries of each facility. The proposed project is not expected to require additional staffing at the security department as the security needs at the integrated Refinery are not expected to change. Thus, no additional or altered police protection would be required for the proposed project once it becomes operational.

As previously discussed in Section 4.10.9, the proposed project is not expected to induce population growth in any way. The existing labor pool in southern California is expected to be sufficient to fulfill the labor requirements for construction of the proposed project. During construction there would be no increase in the local population so no adverse impacts would be expected to local schools or other public facilities. Similarly, once the proposed project becomes operational, the integrated Refinery is not expected to require additional permanent staffing to operate new equipment, so an increase in the local population that could adversely affect local schools or other public facilities is not expected. There would be no increase in population and, therefore, there would be no need for physically altered government facilities.

4.10.11 RECREATION

Parks in the vicinity of the Wilmington and Carson Operations include Silverado, Hudson, and Admiral Kidd Parks in Long Beach; East Wilmington Vest Pocket, East Wilmington Greenbelt, and Banning Parks in Wilmington; and Calas and Friendship Mini-Park in Carson.

The existing labor pool in southern California is sufficient to fulfill the labor requirements for the construction of the proposed project. The operation of the proposed project would not require additional permanent workers to be hired at the Refinery and, therefore, there would be no significant changes in population densities or distribution resulting from the proposed project and, thus, no increase in the use of existing neighborhood and regional parks or other recreational facilities.

Because the proposed project is limited to the confines of the existing industrial facilities and will not result in additional employees during operation, the proposed project would not increase the demand for or use of existing neighborhood and regional parks or other recreational facilities or require the construction of new or expansion of existing recreational facilities that might have an adverse physical effect on the environment because it would not directly or indirectly increase or redistribute population.

CHAPTER 5

CUMULATIVE IMPACTS

5.0 CUMULATIVE IMPACTS

5.1 INTRODUCTION

This chapter presents the analysis of the cumulative impacts, including the analysis of the potential for the proposed project, together with other past, present, and reasonably foreseeable probable future projects producing related impacts in each environmental resource area's cumulative geographic scope, to have significant cumulative effects. Following the presentation of the requirements related to cumulative impact analyses and a description of the related projects (Sections 5.1.1 and 5.1.2, respectively), the analysis in Section 5.2 addresses each of the environmental resource areas for which the proposed project may make a cumulatively considerable contribution to cumulative impacts, when combined with other foreseeable and probable projects in the area causing related impacts. As discussed in the following analysis, some of the impacts to environmental resources affected by the proposed project and other potentially related projects would occur during the construction phase, e.g., air quality and traffic impacts. Construction impacts of cumulative projects causing related impacts were evaluated to determine if their construction activities would occur during the same construction period as the proposed project. If environmental information for a cumulative project is available when the timing of the construction phase of other projects is uncertain or unknown, the construction activities of related projects were assumed to overlap with the proposed project. Other impacts may occur primarily during the operational phase, e.g., hazards. Still other impacts could occur during both phases, e.g., air quality and noise.

5.1.1 REQUIREMENTS FOR CUMULATIVE IMPACT ANALYSIS

CEQA Guidelines §15130 requires that an EIR reflect the severity of the cumulative impacts from a proposed project and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by standards of practicality and reasonableness. Cumulative impacts are defined by CEQA as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines, §15355).

Cumulative impacts are further described as follows:

- The individual effects may be changes resulting from a single project or a number of separate projects (CEQA Guidelines §15355(a)).

- The cumulative impacts from several projects are the changes in the environment which result from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time (CEQA Guidelines §15355(b)).

- A "cumulative impact" consists of an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR (CEQA Guidelines §15130(a)(1)).

In addition, as stated in the CEQA Guidelines §15064(h)(4), "The mere existence of cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable." Therefore, the cumulative impacts analysis in an EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.

The cumulative impact analysis in the following sections first identifies potential cumulative projects, evaluates whether their cumulative impacts are significant, and then determines whether the proposed project's incremental effects, though individually limited, are cumulatively considerable, and, therefore, potentially contributing to significant adverse cumulative impacts (CEQA Guidelines §15064(h)(1)). The cumulative impact analysis focuses on whether the impacts of the proposed project are cumulatively considerable within the context of impacts caused by other past, present, or reasonably foreseeable probable future projects. Section 5.1.2 of this cumulative impact analysis identifies other projects proposed within the area defined for each environmental resource that may have the potential to contribute to cumulatively considerable impacts.

5.1.2 PROJECTS CONSIDERED IN CUMULATIVE IMPACT ANALYSIS

For this EIR, related projects with the potential to contribute to cumulative impacts were identified using the "list approach," using a list of related projects that would be constructed in the geographic scope of the area affected by the cumulative impact, as defined for each technical area (CEQA Guidelines §15130(b)(1)(A)). The list of closely related projects utilized in this analysis is provided in Table 5.1-1.

5.1.2.1 Past Projects

Currently, the proposed project area includes a mixture of industrial, commercial, transportation, and residential uses. The proposed project site itself is located in an industrial area that stretches from Pacific Coast Highway in Wilmington to just south of Interstate 405 in Carson. The proposed project area is zoned for and has been devoted to industrial uses for nearly a century, and includes other refineries, transportation facilities, railroads, intermodal container transfer facilities, tank farms, and other industrial facilities. The Ports of Long Beach (POLB) and Los Angeles (POLA) are located south of the proposed project area. Residents are located west of the Tesoro Carson Operations in the City of Carson; west of the Tesoro Wilmington Operations in the community of Wilmington; and east of the Tesoro Wilmington Operations in the City of Long Beach.

Development of the area has occurred steadily over the past century. However, by the early 1960s the current mix of uses and most of the actual structures such as rail lines, freeways, refineries, warehouses, and tank farms were in place. Further development has consisted of the intensification of industrial uses in response to growth of population and international trade. The major new developments in the area since the 1960s include the Intermodal Container and Transfer Facility (ICTF), which opened in the late 1980s; the Air Products Hydrogen Plant, which opened in the early 1990s; and the Alameda Corridor, which opened in 2002. Other industrial development has also continued to occur within the area as well.

Past development of the area and general vicinity has resulted in various environmental effects that have changed the character of the area, which are described in greater detail in the individual resource analysis sections below (Section 5.2).

5.1.2.2 Current and Future Projects

The geographic scope for the cumulative analysis is discussed under each resource category. These cumulative projects have been identified using databases from the State Clearinghouse, POLA, POLB, City of Long Beach, City of Carson, Joint Powers Authority, City of Los Angeles, SCAQMD, Caltrans, and Alameda Corridor Transportation Authority (ACTA). A total of 44 projects were identified within an approximately one-mile radius of the proposed project ("the cumulative projects"), which, along with the proposed project, could contribute to cumulative impacts to each environmental resource under evaluation (see Table 5.1-1). The study area includes the area around the integrated Tesoro Refinery Carson and Wilmington Operations. Note that Table 5.1-1 focuses on large and substantial projects such as large industrial, residential, and commercial developments and major projects undertaken by the Ports, local cities, and by regional transportation authorities.

Table 5.1-1 does not include numerous small projects such as small-scale residential and commercial developments, conditional use permits for cell towers, permits for new signs, stores and restaurants, modifications to small residential and commercial facilities, and so forth. As long as such minor projects are consistent with the development density established by existing zoning, community plan, or general plan policies for which an EIR was certified, CEQA does not require additional environmental review, except as might be necessary to examine whether there are project-specific significant effects which are peculiar to the project or its site. This streamlines the review of such projects and reduces the need to prepare repetitive environmental studies (CEQA Guidelines §15183(a)). Further, if a cumulative impact was adequately addressed in a prior EIR for a community plan, zoning action, or general plan, and the project is consistent with that plan or action, then an EIR for such a project should not further analyze that cumulative impact. Similarly, the cumulative effects of such minor projects are captured in the projections of overall future growth, e.g., general or specific plans, which typically undergo a comprehensive CEQA analysis. Projected traffic growth is based on the SCAG travel demand model, which captures regional population growth and the related support services/businesses to support that growth from all cities and counties within SCAG's jurisdiction, providing an estimate of cumulative impacts related to population growth.

Table 5.1-1 lists the identified potential cumulative projects where all potential impacts may not have been identified in a certified EIR for existing zoning, community plan, or general plan policies and, thus, would be subject to further CEQA review. Such proposed cumulative projects, along with the proposed project, have the potential to contribute to significant adverse cumulative impacts. In addition to identifying potential cumulative projects, Figure 5.1-1 shows the corresponding locations of the cumulative projects. The projects listed in Table 5.1-1 constitute the "cumulative projects" for purposes of the cumulative impact analysis. In order to provide a conservative estimate of cumulative impacts, it is assumed that the construction and operational impacts associated with the projects listed in Table 5.1-1 could overlap with the proposed project, unless it is clear that construction activities have already been completed.

The list of cumulative projects includes additional projects identified for the Tesoro Los Angeles Refinery (Projects No. 34 through 44 on Table 5.1-1). These projects are not related to or dependent upon the Tesoro Integration and Compliance Project, each of the projects has independent value and purpose, e.g., safety upgrade projects, remediation, emission controls, maintenance activities, or to comply with applicable rules and regulations, and each would proceed regardless of whether the Tesoro Integration and Compliance Project proceeds. Further, these projects have already been evaluated for CEQA applicability

TABLE 5.1-1

List of Cumulative Projects

No.	Project Title	Project Description	Status
Port of Long Beach			
1	Pier A East	Conversion of 32 acres of existing auto storage area into container terminal uses.	Conceptual project. No environmental information available.
2	Pier B Rail Yard Expansion	Expansion of the existing Pier B Rail Yard in two phases, including realignment of the adjacent Pier B Street and utility relocation.	DEIR under preparation. Limited environmental information available.
Port of Los Angeles			
3	Consolidated Slip Restoration Project	Remediation of contaminated sediment at Consolidated Slip at the Port of Los Angeles. Remediation may include capping sediments or removal/disposal to an appropriate facility. Work includes capping and/or treatment of approximately 30,000 cubic yards of contaminated sediments.	Remedial actions are being evaluated in conjunction with Los Angeles RWQCB and U.S. EPA. No schedule established. No environmental information available

TABLE 5.1-1 (Continued)

No.	Project Title	Project Description	Status
4	Southern California International Gateway Project (SCIG)	Construction and operation of a 157-acre near dock railyard intermodal container transfer facility and various associated components, including the relocation of an existing rail operation.	Final EIR certified May 2013. ~~Construction on hold pending litigation.~~ FEIR invalidated.[1]
5	Anchorage Road Soil Storage Site Open Space	This project would create approximately 30 acres of passive open space at the Anchorage Road Soil Site. The project may also include undergrounding utilities and roadway improvements at the Anchorage and Shore Road intersection.	Conceptual plan. On hold. No environmental information available.
6	International Longshore and Warehouse Union Local 13 Dispatch Hall Project	The project will accommodate current and anticipated needs of the International Longshore and Warehouse Union by providing a meeting space and administrative offices for dispatching longshore workers to cargo terminals within the Port and Port of Long Beach .	Final MND certified May 19, 2011. Construction completed at the end of 2015.
ICTF Joint Powers Authority			
7	Intermodal Container Transfer Facility (ICTF) Modernization and Expansion	Modernize and expand the existing ICTF to increase capacity, modernize existing equipment, and rail yard operation methods.	DEIR under preparation by the Joint Powers Authority. Limited environmental information available.
Community of Wilmington			
8	Ultramar Inc. Wilmington Refinery Cogeneration Project	Construct and operate a 35 MW cogeneration plant including new infrastructure supporting the processes and operations throughout the Refinery.	Final ND certified October 10, 2014. Not yet constructed.
9	WesPac Smart Energy Transport System Project	Construct a jet fuel pipeline system to support airport operations at Los Angeles International Airport (LAX) and other airports in the western U.S.	Revised EIR certified July 2011. Not yet constructed.
10	LAUSD SR Span K-8 School	Construction of 1278-student elementary school. Harry Bridges Span School opened August 2012.	FEIR published January 2008. Project complete.

[1] *Fast Lane Transportation, Inc. v. City of Los Angeles, et al.* (Super. Ct. Contra Costa County, 2016, No. Civ. MSN14-0300, app. pending).

TABLE 5.1-1 (Continued)

No.	Project Title	Project Description	Status
11	Banning Museum and Banning Park	Banning Museum: Refurbishment of museum buildings and improvements to the open space/garden. Banning Park: Improvements to Athletic Fields, Recreation Center and Walking Paths.	Project complete.
12	Warren E&P, Inc. WTU Central Facility, New Equipment Project	Implement gas sales without interim gas reinjection and to modify the gas handling component of the 2011 Project to facilitate gas sales.	Final ND published August 2014.
City of Carson			
13	2055 E 223rd St	Proposal for a new Honda motorcycle dealership, including showroom and service area, on a 1.9-acre site with three existing buildings.	Application submitted 09/23/14. . No environmental information available.
14	21801 S Vera St	Proposal to demolish an existing industrial building for development of 18 single-family detached residences, on a 1.2-acre site.	Application submitted 08/25/14. No environmental information available.
15	Sepulveda and Panama Mixed Use Project	Construction of a mixed-use development with 65 senior residential apartment units and 3,000 sq. ft. of commercial space on a 1.22-acre site located to the southwest of E. Sepulveda Blvd and Panama Ave.	MND published April 2015.
16	Shell Oil Products - Carson Revitalization Project - Specific Plan	Shell Oil Products is proposing the redevelopment of the 448-acre Shell Carson Terminal facility located at 20945 South Wilmington Avenue. The project will allow for the subsequent development over a 15- to 25-year time period. The initial phases will include development of an 8.8-acre retail center at Del Amo and Wilmington Avenue, a 12.3-acre business park on Chico Street and the addition of product storage tanks within the center of the property.	DEIR comment period ended March 26, 2014. FEIR under preparation.
17	Winn Hyundai and Winn Chevrolet	A new 24,285-square-foot Hyundai automotive dealership building was constructed to the east of the existing Winn Chevrolet automotive dealership. Winn Chevrolet also modernized the appearance of the existing building with a façade remodel to establish updated architectural features consistent with the new design standards established for the Chevrolet brand.	No environmental information available. Project complete.

TABLE 5.1-1 (Continued)

No.	Project Title	Project Description	Status
18	Wilmington/I-405 Interchange Project	The proposed project includes modification of the ramps, construction of a new I-405 northbound on-ramp, widening of Wilmington Avenue from 223rd Street, south of I-405, to I-405 northbound onramp north of the Interchange, and construction of a right turn lane from Wilmington Avenue northbound to 223th Street eastbound. Additionally, this project includes synchronizing all traffic signals at this location, extending from 220th Street to the north, to 223rd Street to the south.	MND approved in January 2009. Currently, under construction and expected to be complete early 2017.
19	223rd Street Improvement Project	The project includes construction of a raised landscape median and street widening between Wilmington Avenue and Arco Way; rehabilitation of the existing landscape and irrigation system between Lucerne Street and Wilmington Avenue; rehabilitation of approximately 5,750 lineal-feet of existing roadway; installation of parkway trees; construction of new, and replacing of, existing curb, gutter and sidewalks; regulatory traffic signing; pavement striping and all associated work as necessary to these specific improvements.	No environmental information available. Construction expected to begin after completion of Wilmington/Interstate 405 Interchange Project.
20	Sepulveda Blvd Widening from Alameda Street to the east Carson City Limit	The project involves the widening of Sepulveda Boulevard by approximately 1,475 linear feet to provide three lanes of traffic in both directions, an eight foot wide sidewalk, and the modification of the existing traffic signal. The project also involves the widening of the Dominguez Channel Bridge.	No environmental information available. Construction is on-going.
21	Phillips 66 Los Angeles Refinery Carson Plant - Crude Oil Storage Capacity Project - 1520 E Sepulveda Blvd.	Phillips 66 is proposing to increase crude oil storage capacity at its Los Angeles Refinery Carson Plant by installing one new 615,000 barrel crude oil storage tank with a geodesic dome, increasing the annual permit throughput limit of two existing 320,000 barrel crude oil storage tanks, and installing geodesic domes on the same two existing 320,000 barrel crude oil storage tanks. Tie-ins to the Pier "T" crude oil delivery pipeline from Berth 121 would be installed.	Final ND approved December, 2014. Currently under construction.

TABLE 5.1-1 (Continued)

No.	Project Title	Project Description	Status
22	Shell Carson Facility Ethanol (E10) Project - 20945 S Wilmington Ave	Shell proposes to convert existing smaller (69,000 bbl) gasoline storage tanks to ethanol service to maximize efficiency in using its existing storage facilities. The EIR for this project included the following project objectives: 1. Increase the Carson Facility's ethanol storage capacity by approximately 75 percent; 2. Increase ethanol tanker-truck loading capacity by at least 75 percent; 3. Include modifications that would minimize impacts to its existing capacity to receive, store and deliver other petroleum products at current levels; and 4. Maintain operational efficiency, safety and flexibility.	FEIR published December 2012.
23	Carousel Tract	The Los Angeles Regional Water Quality Control Board is the lead agency overseeing Shell Oil Company in the environmental investigation of the Carousel Tract neighborhood. The Water Board has initiated the environmental investigation as a result of potentially significant and harmful contamination in the soils and groundwater underlying the Carousel Tract neighborhood.	DEIR published November 2014. Remediation is ongoing.
24	ProLogis - 21038 S. Wilmington Ave	Operation of a new trailer storage and truck yard use in the MH (Manufacturing, Heavy) zone district. Several shading structures, mechanical equipment, and a rail spur will be removed. Three buildings totaling 11,547 square feet will remain and will be used for the trailer storage and truck yard operation. Approximately 315 truck parking spaces will be added.	No environmental information available. Planning Commission approved on July 22, 2014. Not yet constructed.
25	Panattoni - 2245 E. 223rd St	Proposal includes three industrial concrete tilt-up dock-high warehouse/manufacturing buildings with offices on a five-acre site formerly owned by the Carson Redevelopment Agency. The total building size is 131,754 square feet.	No environmental information available. Plans are under Planning Commission review.

TABLE 5.1-1 (Continued)

No.	Project Title	Project Description	Status
26	Equassure - 440 E. Sepulveda Blvd	Proposal includes developing a two-story apartment complex with 11 units. Total parking includes 25 spaces with 17 alley-loaded garage spaces, 5 canopy spaces and 3 uncovered guest spaces. The project site is 19,326 square feet with a net site area of 18,326 square feet once a five-foot dedication is provided to expand the alley.	No environmental information available. Project approved July 8, 2014. Plans under review by Building and Safety.
27	Car Pros Kia of Carson - 21243 S. Avalon Blvd	Car Pros Kia purchased the former Altman's Winnebago property on Recreation Road so that a new Kia dealership could be constructed. The property will be used for car storage with the main dealership still operating from the Avalon Boulevard location. Upon completion of the new dealership, the Avalon location will continue to be used as a satellite facility.	No environmental information available. Project approved by Planning Commission April 22, 2014.
28	Inland Kenworth - 1202 E. Carson St	Project was a new truck sales and service dealership offering truck sales, parts and repair services.	No environmental information available. Project complete.
29	22303 S Avalon Blvd	Project is a new drive through car wash.	Application submitted June 15, 2015. No environmental information available.
30	1601 E 223rd St	Verizon Wireless proposed to install a new wireless telecom facility.	Application submitted March 26, 2015. No environmental information available.
31	Yusen Logistics Truck Yard – 2250 E Dominguez St	Remodel an existing site to accommodate 428 new truck parking spaces	Project pending review as of November 24, 2015. No environmental information available.

TABLE 5.1-1 (Continued)

No.	Project Title	Project Description	Status
City of Long Beach			
32	California State University Long Beach Foundation Project - 1645 W. Pacific Coast Highway	This project includes demolition of the existing buildings and carports on the site and construction of a new single story building for retail use that would be up to 122,500 square feet in size with 490 on-site parking spaces. The proposed retail building would have a maximum height of 32 feet and could be used by a single retail tenant or by two tenants with separate (side-by-side) entrances.	FEIR published July 2014.
33	Century Villages at Cabrillo (CVC) Phase IV - 2001 River Ave	CVC secured site plan approval for its Cabrillo Gateway project. Construction will be in the southwest quadrant of the community and will add 81 permanent supportive housing units to the Villages and increase CVC's population to approximately 1,250 residents.	No environmental information available. Construction completed in October 2015.
Tesoro Refinery Modifications Independent of the Proposed Project			
34	LPG Recovery Unit PSV Installation, Tesoro Carson Operations	As part of an ongoing refinery-wide Pressure Safety Valve (PSV) validation program and to ensure compliance with SCAQMD's Rule 1118, that regulates atmospheric venting to PSVs, Tesoro intends to connect atmospheric-venting PSVs in the LPG Recovery Unit to the Hydrocracker Flare System. This safety project would reduce atmospheric venting of emissions from the LPG Recovery Unit in the event of pressure buildup. A new knock out drum and heat exchanger equipped with a new PSC will be installed replacing the existing knock out drum that will be removed from services. One PSV will be replaced with a larger PSV. The one new, one replacement and five existing PSVs will be connected to the Hydrocracker Flare System.	Planned for 1st and 2nd quarter of 2017

TABLE 5.1-1 (Continued)

No.	Project Title	Project Description	Status
35	Modification to Dehexanizer Unit, Tesoro Carson Operations	The Dehexanizer Unit will be modified with the addition of a coalescer vessel on the feed going to the straight-run dehexanizer towers. The modification will enhance unit safety and reliability by addressing current and ongoing corrosion and fouling issues related to water carryover in the dehexanizer tower feed. The Dehexanizer Unit will be modified by installing a coalescer vessel and associated piping and instrumentation.	Planned for 1st quarter 2018
36	North Tank Farm Area Remediation System, Tesoro Carson Operations	Tesoro is planning to install a full scale remediation system using multiphase extraction (MPE) technology to control and remove light non-aqueous phase liquid (LNAPL), or free product, in the shallow sand layer in the North Tank Farm area of the Carson Operations. The MPE remediation system will consist of a series of extraction wells that are under vacuum with transfer of recovered vapor and LNAPL to product storage and off-gas treatment. This system is being installed to enhance the existing recovery system and to comply with the existing RWQCB Abatement Order.	Construction planned for 2016 with operation in 2017.
37	FCCU Catalyst Multi-Loader Project, Tesoro Carson Operations	In order to upgrade the overall catalyst handling and injection system, Tesoro proposes to install a new catalyst multi-loader. The new multi-loader would be able to manage the injection of the three catalysts/additives in the FCCU. Additionally, in the unlikely event of malfunction of the SCR system, the multi-loader would also be able to simultaneously inject DeNOx additive, in order to control the NOx emissions from the FCCU while the SCR system was temporarily unavailable, enabling the FCCU to continue operating within applicable NOx control requirements. The multi-loader is expected to reduce particulate matter emissions because it will be more efficient and have better emissions control efficiency than existing equipment, and thus will result in lower emissions.	Construction planned 3rd quarter 2017 through 1st quarter 2018

TABLE 5.1-1 (Continued)

No.	Project Title	Project Description	Status
38	SCAQMD Rule 1114 Compliance – Coker Venting, Tesoro Carson Operations	SCAQMD Rule 1114 requires the coke drum pressure to be reduced below two pounds per square inch gauge (psig) before opening the drum to the atmosphere. The proposed project includes modifying both No. 1 and No. 2 Cokers at the Carson Operations to comply with SCAQMD Rule 1114 by the required compliance deadlines. Compliance with Rule 1114 will require installation of additional equipment, such as vapor ejectors and associated piping and instrumentation changes, to divert coke drum vapors to existing vapor recovery systems. This will enable the Refinery to comply with the Rule 1114 requirements and to keep the overall coke drum cycle time unchanged.	Construction for Coker No. 1 and No. 2 will be complete in the 1st quarter of 2016 and the 1st quarter of 2018 respectively. Impacts from this project were evaluated in the SCAQMD's Environmental Assessment conducted to evaluate the impacts of implementing SCAQMD Rule 1114.
39	Nos. 1 and 2 Coker Bottom Head Modifications, Tesoro Carson Operations	Currently, the bottom heads of the coke drums in Nos. 1 and 2 Cokers are opened manually to remove the petroleum coke, requiring a worker to physically open the valves. The bottom heads of the coke drums will be upgraded with remotely operated valves. This is a safety project that will allow remote operation of the valves to enhance safety during the de-heading process to remove coke at the end of the coking cycle.	Construction for Coker no. 1 and No. 2 will be complete in the 1st quarter of 2016 and the 1st quarter of 2018 respectively.
40	Storage Tank Modifications Tesoro Wilmington and Carson Operations	Tesoro plans on upgrading two existing fixed roof storage tanks to install internal floating roofs at the Wilmington Operations (Tank 80085 and Tank 125001). In addition, Tesoro plans on installing a heat coil in an existing tank at the Carson Operations (Tank 956)	Construction4th quarter 2017 through early 2018.

TABLE 5.1-1 (Concluded)

No.	Project Title	Project Description	Status
41	New Degassing Facilities or Slops Sphere, Tesoro Wilmington Operations	New degassing facilities or a new storage sphere will be installed on the slops rundown header at LARW. This will enable the degassing of slops streams and will minimize potential safety and odor issues associated with managing slops streams containing light ends in atmospheric tanks. Installation of the degassing facilities or a new sphere will allow the slops to de-gas to the vapor recovery system before being routed to the existing atmospheric tanks.	Construction planned 4th quarter 2017 through 3rd quarter 2018.
42	Debutanizer Unit Modifications, Tesoro Wilmington	The LARW Debutanizer Unit will be modified with the addition of a coalescer vessel on the feed to the debutanizer tower. The modification will enhance unit safety and reliability by addressing current and ongoing corrosion issues related to water carryover into the debutanizer tower. The debutanizer removes butane from Refinery overhead gases. The Debutanizer Unit will be modified by installing a coalescer vessel and associated piping and instrumentation.	Construction planned 4th quarter 2017.
43	HTU-3 Modifications, Tesoro Wilmington Operations	The LARW HTU-3 jet filtration system will be modified with the addition of new clay and particulate filters placed in parallel to the existing filters to allow for a more efficient maintenance process on the system. HTU-3 is a distillate hydrotreater, which is a process unit that uses catalyst and hydrogen to reduce impurities such as sulfur from jet and diesel. The HTU-3 Unit modifications include the addition of new clay and particulate filters and associated piping and instrumentation.	Construction was completed in August of 2015.
44	Tesoro Wilmington Operations Fire Water Distribution System Replacement and Upgrade	Tesoro has completed the majority of the planned upgrades to its firewater distribution system at the Wilmington Operations. Piping replacements and system upgrades are being installed throughout the system to meet minimum flow requirements of the City of Los Angeles Fire Department.	Final portions of the system upgrade construction to be completed 4th quarter of 2017.

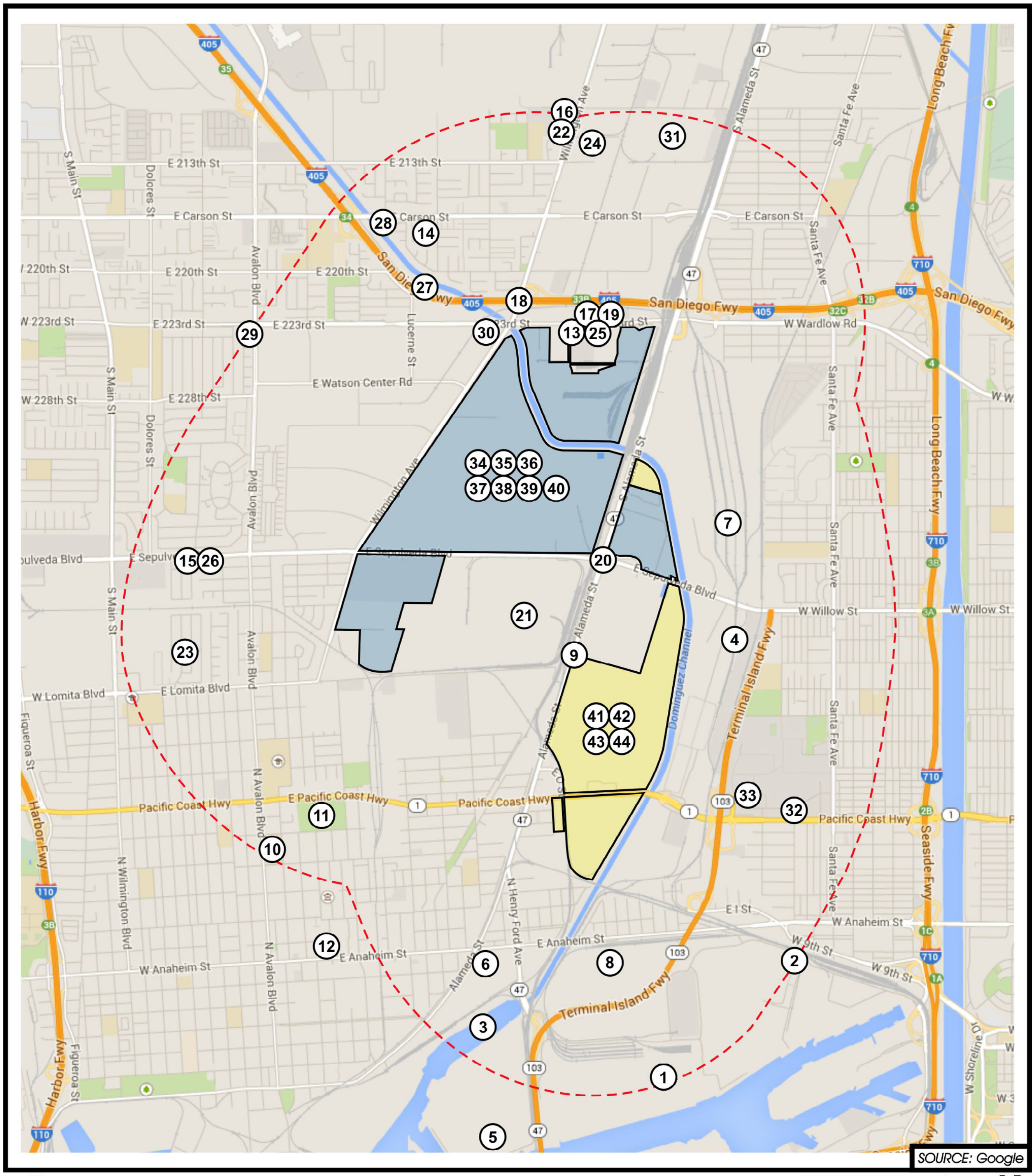


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FIGURE 5.1-1
ONE MILE RADIUS MAP
TESORO LOS ANGELES REFINERY

Project No. 2844

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5.2 CUMULATIVE IMPACT ANALYSIS

The following sections analyze the cumulative impacts identified for each resource area evaluated in this FEIR. As described in the NOP/IS the proposed project has been found to have either no impact or a less than significant impact on all environmental resource areas except for those discussed below. No comments were received on the NOP/IS that identified new potentially significant adverse environmental impacts. As a result, all environmental resource areas for which the proposed project were found to have either no impact or a less than significant impact are considered to be rendered less than cumulatively considerable and are not discussed in this FEIR. Except where noted, the significance criteria used for the cumulative analysis are the same as those used in Chapter 4 for the evaluation of the proposed project impacts. In addition, some of the projects listed in Table 5.1-1 are in very early stages of planning, as a result, information on their potential environmental impacts is unavailable. The cumulative analysis in the following sections does not provide speculation on potential impacts from the cumulative projects for which environmental information is not available as CEQA recommends against speculation (CEQA Guidelines §15145). Detailed environmental information on the SCIG project has been ~~provided~~ stricken, ~~but it is important to note that the results of the environmental analyses provided in the EIR have been legally challenged~~ because the EIR for the SCIG project has been invalidated.

5.2.1 AIR QUALITY

5.2.1.1 Scope of Analysis

The region of analysis for cumulative effects on air quality is the South Coast Air Basin, but the analysis is focused on the communities adjacent to the proposed project (i.e., the City of Carson, City of Long Beach and community of Wilmington) because they are the areas of maximum potential effect. The significance thresholds for cumulative air quality impacts are the same as the significance thresholds for project-specific impacts and are shown in Table 4.2-1.

The SCAQMD has provided guidance on an acceptable approach to addressing the cumulative impacts issue for air quality (SCAQMD, 2003a). "As Lead Agency, the SCAQMD uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment (SCAQMD's certified regulatory program CEQA document) or EIR. The only case where the significance thresholds for project specific and cumulative impacts differ is the HI significance threshold for non-cancer TAC emissions (SCAQMD, 2003a). Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant."

To some extent, the ambient air quality of the Basin provides a summary of the cumulative air quality impacts. The Basin is designated as non-attainment for PM2.5 and ozone for both state and federal standards. The Basin is classified as attainment for both the state and federal standards for NO_2 (except the federal 1-hr standard is unclassifiable/attainment), SO_2, CO, sulfates, and lead except in Los Angeles County and is classified as attainment for the federal PM10 standards, but non-attainment for the state PM10 standards and lead in Los Angeles County. The 2012 AQMP predicted attainment of all National Ambient Air Quality standards by 2019, and ozone standards by 2020 (SCAQMD, 2013a). The total number of days on which the Basin experiences high ozone levels has decreased dramatically over the last two decades. The maximum 8-hour ozone levels measured in the Basin were well above 200 ppb in the early 1990s, and are now less than 140 ppb. However, the Basin still exceeds the federal 8-hour standard more frequently than any other location in the U.S. (SCAQMD, 2013a).

As described in Section 3.2, air quality within the South Coast Air Basin has generally improved in the last couple of decades. The improvement in air quality can be attributed to emission reductions from industrial sources, introduction of low emission fuels used in on-road motor vehicles and trucks (e.g., low sulfur fuels, reformulated gasoline, low carbon fuel standard, etc.), and implementation of Air Quality Management Plans (AQMPs), which identify strategies for further reducing emissions from all emissions sources regulated by the SCAQMD and which are subsequently promulgated as enforceable rules or regulations.

5.2.1.2. Construction Emissions

5.2.1.2.1 Contributions of Cumulative Projects

The projects identified in Table 5.1-1 have the potential for construction activities that could overlap with the construction activities of the proposed project. Table 5.2-1 summarizes the available construction emissions data for the cumulative projects from other CEQA documents where they are available. Construction emissions were not included in Table 5.2-1 where insufficient data are available.

The proposed project ~~is~~was scheduled to be constructed from third quarter 2016 through first quarter of 2021 (see Figure 2-18). The construction schedule is expected to commence following certification of the FEIR and issuance of permit. The dates used here and shown in Figure 2-18 will adjust accordingly. During that time frame, construction activities at a number of other projects could occur in that same period. The construction impacts of the cumulative projects would be cumulatively significant if their combined emissions would exceed the SCAQMD daily emission thresholds for construction. As shown in Table 5.2-1, construction activities associated with the cumulative projects would exceed SCAQMD significance thresholds and could result in significant cumulative air quality criteria pollutant impacts during construction activities.

5.2.1.2.2 Contributions of the Proposed Project

The proposed project would contribute to potentially significant adverse cumulative construction air quality impacts if project-specific construction emissions are considered to be cumulatively considerable as defined by CEQA Guidelines §15064(h)(1). SCAQMD policy is that impacts are cumulatively considerable if they exceed the project-specific air quality significance thresholds. The construction emissions associated with the proposed project are expected to be 106.65 lbs/day of VOC, 515.54 lbs/day of CO, 575.73 lbs/day of NOx, 1.41 lbs/day of SOx, 68.55 lbs/day of PM10, and 38.67 lbs/day of PM2.5. Because the proposed project's construction emissions exceed the applicable project-specific VOC and NOx significance thresholds (see Table 4.2-2), they are considered cumulatively considerable and cumulatively significant when considered in combination with related projects. Since CO, SOx, PM10, and PM2.5 construction emissions do not exceed their respective project-specific thresholds, they are not considered to be cumulatively considerable and, therefore, are not considered to contribute to cumulative construction impacts.

TABLE 5.2-1

Cumulative Construction Emissions (lbs/day)

No.	Project	VOC	CO	NOx	SOx	PM10	PM2.5
4	Southern California International Gateway Project[a]	~~243~~	~~579~~	~~4,038~~	~~56~~	~~90~~	~~67~~
6	ILWU Local 13 Dispatch Hall[b]	70.7	45.3	76.5		34.2	7.4
8	Valero Cogen[c]	6.4	37.6	46.7	0.1	43.2	23.8
9	WesPac[d]	130.82	954.36	669.80	52.96	68.81	40.11
10	LAUSD Span K-8 School[e]	-14	-214	89	<1	-36	-37
12	Warren E&P[f]	0.82	3.12	7.62	--	0.39	0.33
15	Sepulveda/Panama Project[g]	53.59	30.11	43.73	0.05	3.17	2.45
16	Shell Revitalization Project[h]	487.03	334.0	734.0	1.17	645.88	88.44
19	Wilmington/Interstate 405 Interchange[i]	8	42	94	--	13	--
21	Phillips 66 Crude Oil Storage[j]	65.30	71.06	85.75	0.16	46.56	20.15
22	Shell Carson Facility E10 Project[k]	124.9	387.7	745.2	1.0	103.0	39.1
23	Carousel Tract[l]	5	57	62	2	27	8
32	CSULB Foundation Retail Project[m]	71.2	218.1	280.6	0.36	29.7	19.1

(a) POLA, 2013 ~~(The environmental analysis has been challenged and is being litigated)~~(FEIR invalidated)
(b) POLA, 2011a
(c) SCAQMD, 2014a
(d) City of Los Angeles, 2011
(e) LAUSD, 2007
(f) SCAQMD, 2014b
(g) City of Carson, 2015
(h) City of Carson, 2014
(i) Caltrans, 2008
(j) SCAQMD 2014c
(k) SCAQMD, 2012
(l) RWQCB, 2014
(m) City of Long Beach, 2014

Localized air quality significance impacts from construction activities were analyzed for CO, NO_2, PM10, and PM2.5. The construction activities associated with the proposed project are expected to cause significant adverse localized NO_2 air quality impacts and mitigation measures have not been identified to reduce the localized impacts to less than significant during construction. Because the proposed project construction emissions exceed the applicable LST threshold levels (see Table 4.2-3), they are considered cumulatively considerable and cumulatively significant when considered in combination with related projects.

This conclusion is consistent with CEQA Guidelines §15064(h)(4), which states, "The mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable."

5.2.1.3 Operational Emissions

5.2.1.3.1 Contributions of Cumulative Projects

The cumulative projects would have a significant cumulative impact if their combined operational emissions would exceed the SCAQMD daily emission thresholds for operations (see Table 4.2-1). The cumulative projects identified in Table 5.2-2 have the potential for operational activities that could overlap with operational activities associated with the proposed project. Table 5.2-2 summarizes the available operational emissions data for the cumulative projects from other CEQA documents where they are available. Operational emissions were not presented where insufficient data are available.

TABLE 5.2-2

Cumulative Operational Emissions (lbs/day)

No.	Project	VOC	CO	NOx	SOx	PM10	PM2.5
4	Southern California International Gateway Project[(a)]	~~-316~~	~~-2,905~~	~~-5,619~~	~~-139~~	~~-313~~	~~-228~~
6	ILWU Local 13 Dispatch Hall[(b)]	19.9	--	26.9	--	16.9	1.5
8	Valero Cogen[(c)]	33.4	201.8	0	0	95.8	20.6
9	WesPac[(d)]	-27	-266	-40	<1	-33	-30
10	LAUSD Span K-8 School[(e)]	8.76	--	--	--	--	--
12	Warren E&P[(f)]	19.0	14.4	20.5	--	3.7	4.3
15	Sepulveda/Panama Project[(g)]	339.1	546.9	521.6	2.82	203.9	32.4
16	Shell Revitalization Project[(h)]	50.83	0	0	0	0	0
21	Phillips 66 Crude Oil Storage[(i)]	166.8	109.1	249.4	0.3	18.9	12.8
22	Shell Carson Facility E10 Project[(j)]	0	0	0	0	0	0
23	Carousel Tract[(k)]	30	200	50	0.48	32	9.1
32	CSULB Foundation Retail Project[(l)]	4.89	18.95	3.61	0.03	2.26	0.67
34	Tesoro LPG Recovery Unit	0.46	0	0	0	0	0
35	Tesoro Dehexanizer Unit	0.68	0	0	0	0	0
40	Tesoro Storage Tank 956	0.15	0	0	0	0	0

(a) POLA, 2013 ~~(As reported in FEIR, but subject to revision pending outcome of ongoing litigation.)~~(FEIR invalidated)
(b) POLA, 2011a
(c) SCAQMD, 2014c
(d) City of Los Angeles, 2011
(e) LAUSD, 2007
(f) SCAQMD, 2014b
(g) City of Carson, 2015
(h) City of Carson, 2014
(i) SCAQMD 2014c
(j) SCAQMD, 2012
(k) RWQCB, 2014
(l) City of Long Beach, 2014

5.2.1.3.2 Contributions of the Proposed Project

The proposed project includes the shutdown of the Refinery's Wilmington Operations FCCU, which is a major source of emissions. As discussed in Section 4.2.2.2, peak daily emissions associated with the proposed project would result in emission increases from new and modified units, increased mobile source emissions, and increased utilization of some equipment. However, as shown in Table 4.2-4, the overall regional change in emissions associated with implementing the proposed project is a reduction in emissions of CO and a less than significant increase in VOC, NOx, SOx, PM10, and PM2.5 emissions. In addition, emissions of CO, NOx, SOx, and PM10 were modeled using the appropriate average times for each pollutant. Based on the AERMOD air dispersion model results, the ground-level concentrations of the criteria pollutants of concern will be below SCAQMD CEQA significance thresholds at all offsite receptor locations. As a result, criteria pollutant emissions from the proposed project operation are not considered to be cumulatively considerable and, therefore, are not considered to contribute to cumulative operational emission impacts.

5.2.1.4 Toxic Air Contaminants

5.2.1.4.1 Contributions of Cumulative Projects

The SCAQMD measured TAC concentrations as part of its fourth Multiple Air Toxics Exposure Study (MATES IV). The 2012-2013 Basin average population-weighted risk summed for all the toxic components yielded a cancer risk of 897 in one million in MATES IV, using the current OEHHA health risk assessment guidelines. Diesel particulate matter continues to be responsible for the largest contribution (76.2 percent) to cancer risk from air toxics. The next highest contributors include benzene (6.2 percent), hexavalent chromium (5.6 percent), and 1,3-butadiene (3.4 percent) (SCAQMD, 2015a).

The operational impacts of the cumulative projects would be cumulatively significant if their combined emissions would exceed the SCAQMD significance thresholds for health risk assessments (see Table 5.2-3). Impacts associated with TAC emissions are dependent on the location of the receptors so that the results of the TAC emissions are not necessarily additive unless they are emitted from the same or similar location. As shown in Table 5.2-3, no single project would exceed the applicable cancer and non-cancer chronic or acute health risk thresholds. However, TAC emissions associated with the Shell Revitalization Project (#16) and the Shell Carson E10 Project (#22) would be significant for exposure to the MEIR because those two projects are at the same location (see Figure 5.1-1), the TAC emissions would impact the same (or nearby) receptors (residents), and the TAC emissions from those two projects would exceed the 10 per million significance thresholds. Several other large projects would also be expected to generate additional TAC emissions (e.g., trucks and other mobile sources), including the Pier A East (#1), Pier B Rail Yard Expansion (#2), and the ICTF Expansion and Modernization Project (#7). However, TAC emission estimates from these projects are not currently available and the projects are located in the Wilmington/Long Beach area as opposed to Carson. Based on this information, exposure to toxic air contaminants at the MEIR associated with the cumulative projects within the project region is considered to be cumulatively significant. Acute and chronic non-carcinogenic health risks are expected to be less than significant as the hazard index associated with all of the cumulative projects would be less than the SCAQMD significance threshold of 1.0 (see Table 5.2-3).

TABLE 5.2-3

Cumulative Health Risk Assessment Results Associated with Exposure to Toxic Air Contaminant Emissions

No.	Cumulative Project	MEIR	MEIW	Chronic Hazard Index	Acute Hazard Index
4	Southern California International Gateway Project[a]	~~160 x 10^{-6}~~	~~114 x 10^{-6}~~	~~0.11~~	~~0.13~~
6	ILWU Local 13 Dispatch Hall[b]	NS	NS	--	--
8	Valero Cogen[c]	0.57 x 10^{-6}	0.33 x 10^{-6}	0.024	0.019
12	Warren E&P[d]	0.4 x 10^{-6}	0.05 x 10^{-6}	0.0007	0.014
16	Shell Revitalization Project[e]	8.90 x 10^{-6}	7.20 x 10^{-6}	0.022	0.105
21	Phillips 66 Crude Oil Storage[f]	0.13 x 10^{-6}	0.13 x 10^{-6}	0.0005	0.0015
22	Shell Carson Facility E10 Project[g]	2.11 x 10^{-6}	1.55 x 10^{-6}	0.0196	0.002
23	Carousel Tract[h]	0.81 x 10^{-6}	0.09 x 10^{-6}	0.01	0.01
32	CSULB Foundation Retail Project[i]	0.16 x 10^{-6}		0.001	NA

(a) POLA, 2013~~ref~~ (FEIR invalidated)
(b) POLA, 2011a
(c) SCAQMD, 2014a
(d) SCAQMD, 2014b
(e) City of Carson, 2014
(f) SCAQMD 2014c
(g) SCAQMD, 2012
(h) RWQCB, 2014
(i) City of Long Beach, 2014

5.2.1.4.2 Contributions of the Proposed Project

An HRA was performed to determine if TAC emissions generated by the proposed project would exceed the SCAQMD thresholds of significance for cancer risk and non-cancer chronic and acute hazard risks. The maximum cancer risk from the proposed project for the MEIR was determined to be 3.7~~6~~ in one million. The maximum cancer risk to a non-residential sensitive receptor was estimated to be 2.1 in one million. The maximum cancer risk at a worker (MEIW) was estimated to be 9.3~~2~~ in one million. The estimated cancer risk at all of the local receptors was below the 10 in a million threshold. In addition, as described in Section 4.2.2.5, the non-cancer health risks were also determined to be well below the hazard index significance threshold of 1.0. Therefore, TAC emissions from operation of the proposed project would not make a cumulatively considerable contribution to cumulatively significant impacts for carcinogenic and non-carcinogenic health impacts. Note that the HRA did not include the emission reductions associated with the shutdown of the Wilmington Operations FCCU and only included estimated increases associated with the modification of existing and construction of new units, thus providing a conservative analysis of TAC emissions and related health risk. Therefore, the TAC emission impacts associated with the proposed project are not considered to be cumulatively considerable and are not considered to contribute to significant adverse cumulative health risk impacts.

5.2.1.5 Mitigation Measures and Cumulative Impacts

The proposed project's construction emissions exceed the applicable significance thresholds for VOC~~,~~ and NOx (see Table 4.2-2) and, therefore, are cumulatively considerable and cumulatively significant when considered in combination with related projects. Mitigation measures A-1 through A-9 will be imposed on construction activities associated with the proposed project (see Section 4.2.3). However, after mitigation, construction emissions are expected to remain above SCAQMD thresholds for VOCs~~,~~ and NOx. Therefore, the construction of the proposed project would make a cumulatively considerable and unavoidable contribution to a cumulatively significant air quality impact. Implementing mitigation measures at other cumulative projects is not considered feasible because the SCAQMD does not have jurisdictional authority to impose mitigation measures on a project where it is not the lead agency. Once construction is complete, the proposed project, as well as the cumulative projects, would no longer contribute to cumulative construction air quality impacts in the area of the Refinery. Operation emissions from the proposed project are not cumulatively considerable and, therefore, are not considered to contribute to cumulative significant impacts for operational emissions, ambient air quality, or exposure to TACs. Based on these results, operational air quality impact mitigation measures are not required.

5.2.2 GREENHOUSE GASES

5.2.2.1 Scope of Analysis

While the cumulative impact of GHG emissions is global, the geographic scope of this cumulative impact analysis is the State of California. The analysis of GHG emissions is a different analysis than for criteria pollutants for the following reasons. For criteria pollutants, significance thresholds are based on daily emissions because attainment or non-attainment is typically based on daily exceedances of applicable ambient air quality standards. Further, the ambient air quality standards for criteria pollutants are based on relatively short-term exposure effects to human health, e.g., one-hour and eight-hour. Using the half-life of carbon dioxide (CO_2), 100 years, for example, the effects of GHGs are longer-term, affecting the global climate over a relatively long time frame. As a result, the SCAQMD evaluates GHG effects over a longer timeframe than a single day. The interim significance threshold for industrial projects is 10,000 metric tons per year of CO_2 equivalent emissions (see Table 4.2-1).

It is the increased accumulation of GHGs in the atmosphere that may result in global climate change. Due to the complexity of conditions and interactions affecting global climate change, it is not possible to predict the specific impact, if any, attributable to GHG emissions associated with a single project, which is why GHG emission impacts are considered to be a cumulative impact. The following paragraphs provide summaries of some adverse impacts of global climate change identified by the Intergovernmental Panel on Climate Change (IPCC, 2014) that are expected to occur or are occurring as a result of GHG emissions accumulating in the atmosphere.

Climate change involves complex interactions and changing likelihoods of diverse impacts. Emissions of GHGs, especially combustion of fossil fuels for energy, transportation, and manufacturing, contribute to warming of the atmosphere that may cause rapid changes in the way a number different types of ecosystems typically function. For example, in some regions, changing precipitation or acceleration of melting snow and ice are altering hydrological systems, affecting water resources in terms of quantity and quality. Melting glaciers and polar ice sheets are expected to contribute to sea level rise. Rising sea levels are expected to contribute to an increase in coastal flooding events.

A warmer atmosphere could also contribute to chemical reactions increasing the formation of ground-level ozone. Ozone is a well-known lung irritant and a major trigger of respiratory problems like asthma attacks. Local changes in temperature and rainfall could alter the distribution of some waterborne illnesses and disease vectors. For example, warmer freshwater makes it easier for pathogens to grow and contaminate drinking water.

Although the GHG emissions from the Tesoro Los Angeles Refinery will be reduced by the proposed project, the significance of potential impacts from GHG emissions related to the proposed project has been analyzed for long-term operations on a cumulative basis, as discussed below.

5.2.2.2 Contributions of Cumulative Projects

As described in Chapter 3.2 and the discussion in Subsection 5.2.2.1, GHG emissions from human activities are considered to contribute to global climate change. Cumulative projects, which emit GHGs, would contribute to global climate change. In the South Coast Air Basin, CO_2 emissions totaled approximately 155 million metric tons in year 2008 (see Table 3.2-6), most of which comes from energy production and transportation.

The GHG emissions from the cumulative projects would be cumulatively significant if their combined emissions would exceed the SCAQMD emission thresholds for GHGs. As shown in Table 5.2-4, GHG emissions associated with the cumulative projects would exceed the SCAQMD GHG significance threshold of 10,000 metric tons per year. Therefore, the GHG emissions associated with the cumulative projects could result in significant cumulative impacts. Several other large projects would also be expected to generate additional GHG emissions (e.g., trucks and other mobile sources), including the Pier A East (#1), Pier B Rail Yard Expansion (#2), and the ICTF Expansion and Modernization Project (#7). Based on this information, GHG emissions from cumulative projects would exceed the SCAQMD GHG significance threshold and are cumulatively significant.

TABLE 5.2-4

Cumulative GHG Emissions (metric tons per year)

No.	Project	CO_2e
4	Southern California International Gateway Project[(a)]	~~126,491~~
6	ILWU Local 13 Dispatch Hall[(b)]	2,205
8	Valero Cogen[(c)]	0
12	Warren E&P[(d)]	9,979
15	Sepulveda/Panama Project[(e)]	613
16	Shell Revitalization Project[(f)]	68,888
21	Phillips 66 Crude Oil Storage[(g)]	106
22	Shell Carson Facility E10 Project[(h)]	12,349
23	Carousel Tract[(i)]	3,480
32	CSULB Foundation Retail Project[(j)]	7,100

(a) POLA 2013 ~~(The environmental analysis has been challenged and is being litigated)~~(FEIR invalidated)
(b) POLA, 2011a
(c) SCAQMD, 2014a
(d) SCAQMD, 2014b
(e) City of Carson, 2015
(f) City of Carson, 2014
(g) SCAQMD 2014c
(h) SCAQMD, 2012
(i) RWQCB, 2014
(j) City of Long Beach, 2014

5.2.2.3 Contributions of the Proposed Project

5.2.2.3.1 Construction

Construction equipment may include backhoes, compressors, concrete pumps, concrete saws, cranes, excavators, forklifts, front-end loaders, generators, pavers, roll-off trucks, tractors, water truck and welding machines. The construction equipment is assumed to operate up to ten hours per day during most of the construction period. Also, during peak construction periods, a Refinery turnaround is expected to occur requiring two work shifts per day. Emission factors for construction equipment were taken from the Construction Equipment Emissions tables in CARB's Offroad Inventory Model. Estimated GHG emissions from construction equipment are included in Table 5.2-5, with more detailed calculations in Appendix B-1.

TABLE 5.2-5

Construction GHG Emissions for the Proposed Project (metric tons)

Source	$CO_2e^{(a)}$
Construction Equipment	11,582
Vehicle Emissions	11,591
TOTAL	23,173
30 Year Amortized	772

(a) CO_2 equivalent emissions or CO_2e.

The project will also include construction emissions from vehicles traveling off-site. Construction vehicles traveling off-site include trucks, construction worker vehicle emissions, etc. Emission factors for off-site construction vehicles were taken from CARB's EMFAC 2011 Inventory Model. The SCAQMD significance threshold for GHG emissions does not distinguish between construction and operational GHG emissions because of the fact that GHG emissions from all sources remain in the atmosphere for up to 100 years or more. In addition, because there are not many GHG emission reduction opportunities for most types of construction equipment, SCAQMD policy is to combine construction emissions amortized over 30 years (the typical life of a project) with operational emissions and then compare the results to the SCAQMD's GHG significance threshold. The total GHG construction emissions associated with the proposed project are estimated to be 23,173 metric tons (see Table 5.2-5) over the entire construction period, or 772 metric tons per year amortized over 30 years.

5.2.2.3.2 Operation

The total GHG operational emissions from stationary and mobile sources associated with the proposed project are included in Table 5.2-6 (see Appendices B-3 and B-4 for detailed calculations). The proposed project is expected to result in a local overall reduction in GHG emissions associated with the shutdown of the FCCU and associated equipment at the Wilmington Operations (see Table 5.2-6).

Indirect impacts from equipment potentially impacted by the proposed project (upstream or downstream) were also calculated to determine their effect on the proposed project's overall GHG emissions. These potential indirect GHG emission sources include equipment that will not be modified as part of the proposed project, but will operate within existing permit conditions, so no permit modification would be required. <u>The GHG emissions from the annual increase in Wilmington Operations coke deliveries have been calculated based on 1,460 trucks per year to the Port of Long Beach (see Appendix B-5).</u> Indirect GHG emissions have been calculated and are shown in Table 5.2-7.

TABLE 5.2-6

Direct Operational GHG Emissions for the Proposed Project (metric tons per year)

Source	CO_2e
Stationary Sources	
DCU H-100 Heater Duty Bump (Wilmington)	33,282
HCU H-300/301 Heater Duty Bump (Wilmington)	28,074
SARP Process Air Heater (Wilmington)	9,306
SARP Decomp. Furnace (Wilmington)	19,542
SARP Converter Heater (Wilmington)	2,326
FCCU Shutdown[(b)] (Wilmington)	
FCCU	-247,466
CO Boiler	-72,569
Heaters H2, H3/H4, and H5	-63,577
Startup Heater	-433
No. 51 Vacuum Unit Heater (Carson)	59,707
Naphtha HDS ULNB Conversion (Carson)	3,910
Total Stationary Source Emissions	**-227,898**
Mobile Source Emissions	
Vehicle Emissions	24
Off-site Rail Emissions	1,200
On-site Rail Emissions	125
Total Mobile Source Emissions	**1,349**
TOTAL GHG EMISSIONS	**-226,549**

Note: Negative numbers represent emission reductions.

TABLE 5.2-7

Tesoro Los Angeles Refinery - Indirect Operational GHG Emissions Summary (metric tons per year)

Source	CO_2e
Stationary Sources	
DCU Heater H-101 (Wilmington)	3,414
HTU #3 Heaters H-30 and H-21/22 (Wilmington)	3,999
CRU Heaters H-501A/B, H-502, H-503/504, and H-510 (Wilmington)	975
Boilers 7, 8, 9, and 10 (Wilmington)	4,886
SRP Boilers H-1601/1602 (Wilmington)	53
SRP Incinerators F-704 and F-754 (Wilmington)	66
FCCU (Carson)	104,986
HC Heater R-1 (Carson)	7,146
HC Heater R-2 (Carson)	9,528
LHU Heater (Carson)	2,377
Watson Cogen Facility	~~22,208~~ 20,147
Mobile Source Emissions	
Vehicle Emissions	25
TOTAL INDIRECT GHG EMISSIONS	**~~159,638~~ 157,602**

The total GHG emissions for the proposed project including the project operational emissions (both stationary and mobile sources), indirect GHG emissions from increased utilization of refinery equipment and amortized GHG emissions from construction activities are summarized in Table 5.2-8.

TABLE 5.2-8

Tesoro Los Angeles Refinery
Proposed Project Total GHG Emissions Summary
(metric tons per year)

Source	CO_2e
Construction Emissions[(a)]	772
Stationary Sources	-227,898
Mobile Source Emissions	1,349
Increased Utilization Emissions	~~159,638~~ 157,602
TOTAL PROJECT GHG EMISSIONS	~~-66,139~~ -68,175
AB32 Cap and Trade Allowance Program	~~66,139~~ 68,175
OVERALL PROJECT IMPACT	**0**
Significance Threshold	10,000
SIGNIFICANT?	**No**

Note: Negative numbers represent emission reductions.
(a) Construction Emissions were amortized for 30 years.

As shown in Table 5.2-8, the proposed project is expected to result in local GHG emission reduction of approximately 68,175~~66,139~~ metric tons per year, providing a net GHG emission reduction from the Refinery, thus, reducing the Refinery's contribution to global climate change. Beginning in 2015, Refineries are obligated to provide allowances for transportation fuels produced. Therefore, mobile source GHG emissions are included in the AB32 Cap and Trade Program. However, per the requirements of AB 32, the number of GHG allowances in California's Cap and Trade Program are reduced each year by the California Air Resources Board. An individual project that reduces GHG emissions may reduce local GHG emissions, but will not have an impact on the overall pool of allowances in the GHG Cap and Trade Program.

CEQA Guideline §15130(a) indicates that an EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable. Where a lead agency is examining a project with an incremental effect that is not cumulatively considerable, a lead agency need not consider the effect significant, but must briefly describe the basis for concluding that the incremental effect is not cumulatively considerable. The proposed project would not result in any increase in GHG emissions and GHG impacts are not considered to be cumulatively considerable. Further, "The mere existence of cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable" (CEQA Guidelines §15064(h)(4)). Therefore the project's contribution to GHG emissions is not cumulatively considerable and thus not significant because the GHG emissions would be reduced as a result of implementing the proposed project (CEQA Guidelines §15130).

5.2.2.4 Mitigation Measures and Cumulative Impacts

Mitigation measures are not required because GHG emissions from the proposed project are not considered to be cumulatively considerable and, therefore, would not contribute to an existing cumulative significant impact for GHG emissions from other cumulative projects. No residual cumulative impacts are expected.

5.2.3 HAZARDS AND HAZARDOUS MATERIALS

5.2.3.1 Scope of Analysis

The geographic scope for cumulative impacts associated with a release of hazardous materials encompasses two main areas: (1) refining activities and facilities; and (2) product transport. The related projects list is based on the geographic area of the proposed project site (i.e., Tesoro Carson and Wilmington Operations, including the Interconnecting Pipelines. Hazard impacts generally occur within the vicinity of the proposed project, e.g., the maximum distance a hazard impact from the proposed project is likely to reach is approximately 1,905 feet (see Chapter 4, Table 4.3-2). Thus, cumulative hazard impacts associated with past, present, and reasonably foreseeable future projects are expected to be limited to less than one mile from proposed project activities. The cumulative impact analysis herein evaluates projects within one mile to provide a conservative analysis. The cumulative projects that could contribute to these cumulative impacts and where environmental information is available include those projects that would handle and transport hazardous materials within and near the Cities of Carson and Long Beach, and the community of Wilmington (see Table 5.1-1).

5.2.3.2 Contributions of Cumulative Projects

5.2.3.2.1 Construction

A number of projects have the potential to uncover contaminated soils during construction activities including WesPac (#9), Shell Revitalization Project (#16), Phillips 66 Crude Oil Storage Capacity Project (#21), Shell Carson Facility Ethanol Project (#22), and the Carousel Tract remediation (#23). A summary of the conclusions from the CEQA documents prepared for these and other cumulative projects is provided in Table 5.2-9. The construction hazard impacts were considered to be less than significant or mitigated to less than significant for all of the related projects (see Table 5.2-9). Since the construction hazard impacts are less than significant for each cumulative project and the geographical distance between the cumulative projects, shown in Figure 5.1-1, would preclude overlap of impact areas, no significant cumulative impact from construction hazards is expected.

5.2.3.2.2 Operations

There are a number of cumulative projects in the vicinity of the Tesoro Los Angeles Refinery that include increasing the storage or transport of hazardous materials. Those projects would include WesPac Smart Energy Transport Project (#9), Warren E&P (#12), Phillips 66 Crude Oil Storage Capacity Project (#21), Shell Carson Facility Ethanol Project (#22), and the Carousel Tract remediation (#23). A summary of the conclusions from the CEQA documents prepared for these and other cumulative projects is provided in Table 5.2-9.

TABLE 5.2-9

Cumulative Projects – Summary of Hazard Impact Analyses

No.	Project	Construction	Operation
4	Southern California International Gateway Project[a]	~~NS~~	~~NS~~
6	ILWU Local 13 Dispatch Hall[b]	NS	NS
8	Valero Cogen[c]	NS	NS
9	WesPac[d]	MNS	NS
10	LAUSD Span K-8 School[e]	NA	MNS
12	Warren E&P[f]	NS	NS
15	Sepulveda/Panama Project[g]	NS	NS
16	Shell Revitalization Project[h]	MNS	NS
19	Wilmington/Interstate 405 Interchange[i]	MNS	NA
21	Phillips 66 Crude Oil Storage[j]	NS	NS
22	Shell Carson Facility E10 Project[k]	NS	S
23	Carousel Tract[l]	NS	Beneficial
32	CSULB Foundation Retail Project[m]	MNS	NS

Key: NA = not applicable, resource was not evaluated; NS – not significant; MNS = mitigated not significant; S = significant; Beneficial = site is being remediated so the hazards associated with the site are expected to be reduced.

(a) POLA, 2013 ~~(The environmental analysis has been challenged and is being litigated)~~(FEIR invalidated)
(b) POLA, 2011a
(c) SCAQMD, 2014a
(d) City of Los Angeles, 2011
(e) LAUSD, 2007
(f) SCAQMD, 2014b
(g) City of Carson, 2015
(h) City of Carson, 2014
(i) Caltrans, 2008
(j) SCAQMD 2014c
(k) SCAQMD, 2012
(l) RWQCB, 2014
(m) City of Long Beach, 2014

The hazard impacts associated with the Carousel Tract (#23) were expected to be beneficial because the site would be remediated and eliminate the existing contaminated areas that currently exist (RWQCB, 2014).

As discussed in Section 4.3 of this EIR, the effects of an accidental release of a hazardous material or potential explosion can be shown to occur in discrete areas, referred to as vulnerability zones. To determine if cumulative hazard impacts are significant, the off-site vulnerability zones from two or more facilities would need to overlap. The off-site vulnerability zones for a specific type of hazard (e.g., thermal radiation, BLEVE, etc.) would need to be located sufficiently close so that they overlap and the events would need to occur simultaneously for there to be a cumulative effect. As shown in Figure 5.1-1, the distance between cumulative projects and the proposed project is great enough that no cumulative project off-site vulnerability zones are expected to overlap with the proposed project. The only cumulative project with the potential for off-site hazard impacts is the Shell Carson Facility E10 Project (#22) and hazard impacts associated with that project were considered to be significant (SCAQMD, 2012). The hazards from the Shell Carson Facility E10 Project (#22) could have off-site hazards that would impact the Shell Revitalization Project (#16) and the ProLogis trailer storage and truck yard (#24). However, the Shell Revitalization Project (#16) and the ProLogis Project (#24) are not expected to have significant off-site hazard impacts, so cumulative hazard impacts would not be expected.

In addition to distance between facilities, another factor that may affect cumulative hazard impacts is whether or not the cumulative projects handle large volumes of hazardous materials. For example, while projects identified in Table 5.1-1, such as a new Honda motorcycle dealer (#13); new Hyundai and Chevrolet dealer (#17); Wilmington Avenue/Interstate 405 Interchange (#18); 223rd Street Improvements (#19), and new warehouses (#25) are located in close proximity to each other, they would not be expected to store large volumes of hazardous materials. Finally, regulatory requirements for facilities that handle large volumes of hazardous materials, such as spill prevention and containment requirements, are designed to limit the impacts of a spill or other type of on-site release, which would further minimize cumulative hazard impacts by reducing the size any vulnerability zones.

The cumulative projects listed in Table 5.1-1 have and would continue to generate truck trips that travel through the Wilmington/Carson areas. Some cumulative projects that would potentially increase transportation-related hazards include: Pier B Rail Yard Expansion (#2)~~, SCIG Gateway Project (#4),~~ and ICTF Modernization and Expansion Project (#7). POLA reports that in 2011 24,192 hazardous materials permits were issued for containers and over 4 million 20-foot equivalent containers were received (approximately 0.7%) (POLA, 2011 and POLA, 2013a). Therefore, these projects involve the transport of containers which do not typically include the transport of hazardous materials. Further, most of the other cumulative projects do not involve the transport of substantial amounts of hazardous materials (including Projects #3, #5, #6. #8, #10 through #20, and #23 through #44).

The only project that increases the transport of hazardous materials is the Shell Carson Facility E10 Project (#22). The incremental increase in the annual probability of an accident involving a release of ethanol resulting in a fire or explosion from the Shell E10 Project would be 0.038 per year (0.073 per year - 0.035 per year). This accident probability is equivalent to a transportation accident with a resultant fire or explosion every 26 years. Thus, the incremental probability of a transportation accident and a resultant fire or explosion during operation of the proposed project is small and, therefore, concluded to be less than significant (SCAQMD, 2012). Therefore, the transportation hazards associated with the cumulative projects is considered to be less than significant. The probable frequency and/or severity of consequences are also minimized because all vehicles are subject to traffic laws and restrictions, weight and speed limits, designated truck routes, and cargo packaging and labelling requirements.

Several cumulative projects in Table 5.1-1 would provide transportation improvements, including improvements in traffic flow such as the Wilmington/Interstate 405 Interchange Project (#18), 223rd Street Improvement Project (#19), and the Sepulveda Boulevard Widening Project (#20). By improving traffic flow, traffic congestion is expected to be reduced, thus reducing one factor that influences traffic accidents, especially for heavy-duty transport trucks.

5.2.3.3 Contributions of the Proposed Project

5.2.3.3.1 Construction

Construction activities will require the excavation of potentially contaminated soil and potentially expose workers to soil and groundwater contamination. Compliance with existing regulations and implementation of the proposed project safety measures are intended to minimize the potential impacts associated with excavation. Such compliance is expected to reduce the potential hazard impacts associated with hydrocarbon-contaminated soil and groundwater. Therefore, hazards and hazardous material impacts generated by excavation activities associated with the proposed project are expected to be less than significant, are not cumulatively considerable, and would not contribute to significant adverse hazard impacts associated with construction.

5.2.3.3.2 Operations

As indicated in Section 4.3 of this EIR, the proposed project would be subject to applicable federal, state, and local laws and regulations governing the spill prevention, storage, use, and transport of hazardous materials, as well as emergency response to hazardous material spills, thus minimizing the potential for adverse health and safety impacts. Potential health and environmental impacts associated with hazardous materials spills are also localized due to the containment facilities that currently exist and the new containment facilities that will be required to be built as part of the proposed project. For example, all storage tanks are required to provide secondary containment facilities (e.g., berms) that would contain 110 percent of the volume of the storage tanks, which assures that spills remain on-site and not overlap with hazards at other facilities.

New units have the potential to generate off-site impacts that could potentially expose off-site receptors to new hazards, e.g., the SARP (exposure to SO_2), and the new crude storage tanks at the Carson Operations (pool fire), as well as the new Interconnecting Pipelines (flash fire), and modifications to the Naphtha Isomerization Unit (flash fire). The largest project-related hazard zone or vulnerability zone is associated with the SARP and could result in a hazard impact of up to 1,905 feet in the southern portion of the Wilmington Operations (see Chapter 4, Table 4.3-2). The closest off-site cumulative project to the SARP is about 3,000 feet away (Valero Cogen Project #8). Although the project-related hazard impacts would generally be limited to industrial areas, they are not expected to overlap with hazards from cumulative projects. The only other cumulative project that has the potential for off-site hazards, based on the available environmental information, is the Shell Carson Facility E10 Project (#22), which is located over one mile away from any of the proposed project hazard areas. Nonetheless, hazard impacts from the proposed project would make a cumulatively considerable contribution to a significant adverse cumulative hazard impact.

The proposed project would also include transporting hazardous materials by truck and rail. The proposed project would decrease the transportation hazards associated with sulfuric acid as sulfuric acid would be regenerated on-site. However, the proposed project will increase the transportation of LPG via rail and increase the transport of caustic and spent caustic via truck and rail. The proposed project was considered to be less than significant for the transport of hazardous materials by truck and rail. Therefore, the proposed project is not cumulatively considerable as it relates to hazardous material transport and, therefore, would not contribute to significant adverse hazardous materials transport impacts.

5.2.3.4 Mitigation Measures and Cumulative Impacts

As discussed in Section 4.3.2.1 of this EIR, project-specific fire hazard impacts of the proposed project associated with the operation of the Naphtha Isomerization, new crude tanks, and Interconnecting Pipelines could extend off-site as well as SO_2 hazards associated with the proposed SARP and are considered to be significant and are concluded to be cumulatively considerable (see Table 4.3-2). Compliance with existing regulations (e.g., PSM, RMP, and CalARP requirements) and implementation of mitigation measure HHM-1 would further minimize the potential impacts associated with a release, but are not expected to eliminate the potential hazard impacts. No feasible mitigation measures were identified to further reduce significant adverse hazard impacts. Implementing mitigation measures at other cumulative projects is not considered feasible because the SCAQMD does not have jurisdictional authority to impose hazard mitigation measures on a project where it is not the lead agency and, for projects that are under the jurisdiction of the SCAQMD, all feasible mitigation measures were imposed. Therefore, cumulative adverse hazard impacts would remain significant after implementing mitigation measures and the proposed project would make a cumulatively considerable contribution to a cumulative hazard impact.

5.2.4 HYDROLOGY AND WATER QUALITY

5.2.4.1 Scope of Analysis

The geographic scope for cumulative impacts on water quality would be the Dominguez Channel and the area south of Interstate 405 extending to the Los Angeles-Long Beach Harbor which receives the wastewater discharges from the cumulative projects. For water demand, the geographic scope of the analysis is the West Coast Basin.

5.2.4.2 Contributions of Cumulative Projects

5.2.4.2.1 Water Demand

Construction: Some of the cumulative projects are urban in-fill projects and, as such, are not expected to generate extensive water use impacts. Those projects would include ILWU Dispatch Hall (#6), LAUSD K-8 School (#10), Banning Museum and Banning Park (#11), new Honda dealer (#13), 18 new single family residences (#14), Sepulveda and Panama Project (#15), new Hyundai and Chevrolet dealership (#17), ProLogis Project (#24), Panattoni Project (#25), Equassure Project (#26), Car Pros Kia (#27), and Inland Kenworth (#28). A summary of the water demand impacts in the CEQA documents prepared for the cumulative projects is provided in Table 5.2-10. A review of the available CEQA documents for the cumulative projects did not identify any other projects that were concluded to have potentially significant adverse impacts to water demand during construction or operational activities, with the exception of the Shell Carson Facility E10 Project which is discussed in the paragraph below.

Operation: As shown in Table 5.2-10, the only project with potentially significant water demand impacts is the Shell Carson Facility E10 Project as up to 7.7 million gallons of water would be used for hydrostatic testing prior to operation of the tanks. Reclaimed water is not currently available so the impacts on water demand were considered significant for both construction and operation as hydrostatic testing would be required approximately once every 20 years (SCAQMD, 2012).

The proposed project was considered to be less than significant for the water demand. Therefore, the proposed project is not cumulatively considerable as it relates to water demand (CEQA Guidelines §15064(h)(1)) and, therefore, would not contribute to significant adverse water demand impacts.

5.2.4.2.1 Water Quality

Construction and Operation: A review of the available CEQA documents for the cumulative projects did not identify any other projects that were concluded to have potentially significant adverse impacts to water quality/wastewater discharge during construction or operation. Water quality impacts associated with the cumulative projects are not expected to result in cumulative impacts. If applicable, all projects would be required to comply with stormwater pollution prevention requirements during project operation and construction as well as NPDES requirements for commercial and industrial facilities required to obtain such permits. Compliance with existing stormwater and wastewater discharge requirements is expected to ensure cumulative water quality impacts are less than significant during both construction and operation.

TABLE 5.2-10

Cumulative Projects – Summary of Hydrology and Water Quality Impacts

No.	Project	Water Demand Construction	Water Demand Operation	Water Quality/ Wastewater Construction	Water Quality/ Wastewater Operation
4	Southern California International Gateway Project	~~NS~~	~~NS~~	~~MNS~~	~~NS~~
6	ILWU Local 13 Dispatch Hall[(b)]	NS	NS	NS	NS
8	Valero Cogen[(c)]	NS	NS	NS	NS
9	WesPac[(d)]	NA	NA	NS	MNS
10	LAUSD Span K-8 School[(e)]	NS	NS	NS	NS
12	Warren E&P[(f)]	NA	NS	NA	NS
15	Sepulveda/Panama Project[(g)]	NA	NS	MNS	MNS
16	Shell Revitalization Project[(h)]	NS	NS	NS	NS
19	Wilmington/Interstate 405 Interchange[(i)]	--	--	NS	NS
21	Phillips 66 Crude Oil Storage[(j)]	NS	NS	NS	NS
22	Shell Carson Facility E10 Project[(k)]	S	S	NS	NS
23	Carousel Tract[(l)]	NA	NA	NS	NS
32	CSULB Foundation Retail Project[(m)]	NS	NS	NS	MNS

Key: NA = not applicable, resource was not evaluated; NS – not significant; MNS = mitigated not significant; S = significant.

(a) POLA, 2013 ~~(The environmental analysis has been challenged and is being litigated)~~(FEIR invalidated)
(b) POLA, , 2011a
(c) SCAQMD, 2014a
(d) City of Los Angeles, 2011
(e) LAUSD, 2007
(f) SCAQMD, 2014b
(g) City of Carson, 2015
(h) City of Carson, 2014
(i) Caltrans, 2008
(j) SCAQMD 2014c
(k) SCAQMD, 2012
(l) RWQCB, 2014
(m) City of Long Beach, 2014

5.2.4.3 Contributions of the Proposed Project

5.2.4.3.1 Water Demand

Construction: The proposed project's impacts on water demand during construction operation are expected to be less than significant as minimal potable water use is expected to be required. During hydrostatic testing associated with construction activities, the daily amount of potable water needed would be approximately 40,000 gpd, which is less than the SCAQMD's potable water significance threshold of 262,820 gpd. It should be noted that the water use associated with grading activities and hydrotesting would cease following construction activities and no further water demand would be required for these purposes. Furthermore, the new pipeline hydrostatic testing using potable water would only occur on a small number of days during the construction period and the water would be recycled and reused to the greatest extent possible to reduce potable water demand. See Chapter 4.4 for more detailed discussion of water demand associated with proposed project construction. Therefore, the proposed project impacts on water demand during construction do not contribute to cumulative water demand impacts.

Operation: The Refinery currently uses on average about 13.8 million gpd of fresh/potable water and about 4.5 million gpd of reclaimed water. The proposed project is expected to increase potable water demand by about 191,275 gpd (approximately 69.8 million gallons per year), which is less than the SCAQMD's potable water demand significance threshold of 262,820 gpd. The incremental increase in potable water use from the proposed project is expected to be supplied by the Refinery's privately-owned wells (i.e., from the available 2.8 billion gallons per year of adjudicated water rights). The existing water supply can meet the water demand of the proposed project and the daily water use associated with the proposed project is less than the potable water significance threshold of 262,820 gpd. Therefore, the proposed project water supply impacts are expected to be less than significant. See Chapter 4, subsection 4.4.2.1.2 for a more detailed discussion of the water demand associated with the proposed project operation. Since the water supply impacts during operation of the proposed project are expected to be less than the potable water significance threshold and the Refinery has sufficient adjudicated water rights to support the proposed project's increase in water demand, the proposed project's water demand impacts are not cumulatively considerable and cumulative impacts are considered less than significant.

5.2.4.3.2 Water Quality

Construction: The potential for wastewater generation and water quality impacts associated with construction activities at the Refinery was determined to be less than significant in the NOP/IS (see Appendix A) because construction activities are not expected to generate any additional wastewater as there will be no changes to any refinery units during construction activities and stormwater runoff is contained on-site.

Operation: The proposed project is expected to reduce overall wastewater generated at the Refinery by approximately 79,344 gpd (see Table 4.4-2). The major source of wastewater reduction associated with the proposed project is from the shutdown of the Wilmington Operations FCCU. There is expected to be a large increase in wastewater generation from the SARP. However, overall the proposed project will result in an estimated reduction of over 79,000 gpd. Therefore, no new wastewater treatment facilities are needed and the existing facilities are adequate to meet the needs of the proposed project. Because the proposed project reduces wastewater and demand on wastewater treatment facilities, the proposed project impacts on water quality are not cumulatively considerable and do not contribute to cumulative water quality impacts.

5.2.4.4 Mitigation Measures and Residual Cumulative Impacts

Mitigation is not required because the impacts of the proposed project on water demand and water quality are not cumulatively considerable and, therefore, do not contribute to significant cumulative water demand or water quality impacts.

5.2.5 NOISE

5.2.5.1 Scope of Analysis

The geographic scope for cumulative noise impacts generally includes the areas surrounding the Tesoro Carson and Wilmington Operations. The analysis of cumulative noise impacts uses the same thresholds of significance as the project-specific analysis (Section 4.5.1) and assesses the potential of the proposed project, along with other cumulative projects within the geographic scope of the project (Carson and Wilmington areas), to cause a significant cumulative noise impact as a result of project construction and operational activities (including on-site operations).

5.2.5.2 Construction

5.2.5.2.1 Contributions of Cumulative Projects

A summary of the noise impacts in the CEQA documents prepared for the cumulative projects is provided in Table 5.2-11. As noted in Table 5.2-11, none of the cumulative projects were expected to generate in significant noise impacts, except that remediation activities associated with the Carousel Tract (#23) would occur close to homes, generating potentially significant noise impacts.

Construction of some of the other cumulative projects that are near the proposed project could occur concurrently with the proposed project, e.g., ICTF (#7), new Honda dealership (#13), new Hyundai and Chevrolet dealership (#17), Wilmington/Interstate 405 Interchange (#18), 223rd Street Improvement Project (#19), Phillips 66 (#21), LPG Recovery (#34), Dehexanizer Unit (#35), North Tank Farm (#36), FCCU Catalyst (#37), Rule 1114 Compliance (#38), Nos. 1 and 2 Coker (#39), New Degassing Facilities (#40), Debutanizer Unit (#41), Storage Tank Modifications (#43), and Fire Water Replacement/Upgrade (#44). However, noise, including construction noise, is generally site-specific and localized to the vicinity of the noise source at each cumulative project. As shown in Table 4.5-2, noise levels associated with construction activities subside quickly with distance from the location of the noise source. Because noise is measured on a logarithmic scale, to increase noise by three decibels (triggering a significant noise impact) it would take a doubling of noise levels in the area. The Wilmington/Carson area in the vicinity of the proposed project contains a number of heavy industrial facilities, as well as transportation corridors that generate noise, and a doubling of noise sources during the construction phase is not expected to occur. Table 3.5-3 shows ambient noise levels in the vicinity of the Refinery. It is assumed that ambient noise levels near cumulative projects located in industrial areas would be similar, although the ambient noise levels could be higher for cumulative projects located near substantial noise sources, such as the Interstate 405 freeway. Further, noise levels decrease at least six decibels with every doubling of distance. For example, a noise level of 65 dBA at 50 feet from a source would be about 59 dBA at 100 feet from the source, 53 dBA at 200 feet from the source, and so forth. If the cumulative projects generate comparable noise levels as the proposed project, 0.1 to 0.9 dBA at the closest residential receptor (see Table 4.5-2 and Subsection 5.2.5.2.2), then because of the distance between the cumulative projects it is unlikely that any overlapping noise levels would exceed the applicable noise significance thresholds. In spite of the information regarding noise impacts from the proposed project, other cumulative projects have concluded that construction noise impacts could exceed applicable noise significance thresholds. Therefore, cumulative noise impacts from the cumulative projects are considered to be significant. Further, construction activities at the cumulative projects are temporary and would cease when construction or remediation activities are completed.

TABLE 5.2-11

Cumulative Projects – Summary of Noise Impacts

No.	Project	Construction	Operation
4	Southern California International Gateway Project[a]	~~MNS~~	~~S~~
6	ILWU Local 13 Dispatch Hall[b]	NS	NS
8	Valero Cogen[c]	NS	NS
9	WesPac[d]	MNS	None
10	LAUSD Span K-8 School[e]	MNS	NS
12	Warren E&P[f]	NS	NS
15	Sepulveda/Panama Project[g]	MNS	NS
16	Shell Revitalization Project[h]	MNS	NS
19	Wilmington/Interstate 405 Interchange[i]	MNS	MNS
21	Phillips 66 Crude Oil Storage[j]	NS	NS
22	Shell Carson Facility E10 Project[k]	NS	NS
23	Carousel Tract[l]	S	MNS
32	CSULB Foundation Retail Project[m]	MNS	MNS

Key: NA = not applicable, resource was not evaluated; NS – not significant; MNS = mitigated not significant; S = significant.

(a) POLA Los Angeles, 2013 ~~(The environmental analysis has been challenged and is being litigated)~~(FEIR invalidated)
(b) POLA, 2011a
(c) SCAQMD, 2014a
(d) City of Los Angeles, 2011
(e) LAUSD, 2007
(f) SCAQMD, 2014b
(g) City of Carson, 2015
(h) City of Carson, 2014
(i) Caltrans, 2008
(j) SCAQMD 2014c
(k) SCAQMD, 2012
(l) RWQCB, 2014
(m) City of Long Beach, 2014

5.2.5.2.2 Contributions of the Proposed Project

As described in Section 4.5.2.1, construction of the proposed project would result in minor increases in noise levels at the closest residential areas. As shown in Table 4.5-2, the increase in noise associated with the proposed project construction activities are expected to increase from 0.1 to 0.9 dBA depending on the location of the noise receptor and the time of day. Noise levels are reduced quickly with distance. The construction noise sources range from about 75-80 dBA and those noise levels are reduced to less than 59 dBA at the closest noise receptor located approximately 1,000 feet from the source, which would be true during either daytime or nighttime. Construction activities associated with the proposed project are not expected to occur within 1,000 feet of construction activities associated with other cumulative projects in areas where there are sensitive receptors (see Figure 5.1-1). The Wilmington/Carson area in the vicinity of the proposed project contains a number of heavy industrial facilities, as well as transportation corridors that contribute to ambient noise levels (see Table 4.5-2 for ambient noise levels monitored near the Refinery), and a substantial change in these noise sources is not expected to occur. In addition, as stated in the CEQA Guidelines, §15064(h)(4), "The mere existence of cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable." Further, construction activities are temporary and would cease when construction is completed. These construction noise increases are less than significant and not cumulatively considerable, and do not contribute to significant adverse cumulative noise impacts during construction.

5.2.5.3 Operations

5.2.5.3.1 Contributions of Cumulative Projects

As noted in Table 5.2-11, none of the cumulative projects were expected to result in significant adverse noise impacts during operation~~, except for SCIG (#4)~~. Off-site noise, including noise from truck trips and trains, can also increase ambient noise levels along transportation corridors. Several other large cumulative projects would also be expected to generate additional noise (e.g., trucks and other mobile sources), including the Pier A East (#1), Pier B Rail Yard Expansion (#2), and the ICTF Expansion and Modernization Project (#7). Based on the existing environmental information on the cumulative projects~~, only SCIG (#4)~~ no projects would be expected to generate significant cumulative noise impacts associated with the operation of the cumulative projects.

5.2.5.3.2 Contributions of the Proposed Project

As demonstrated in Subsection 4.5.2.2, project-specific operational noise impacts associated with the proposed project were determined to be less than significant. As shown in Table 4.5-3, the increase in noise associated with equipment and activities related to the proposed project would increase overall noise by 0.1 dBA at the nearest sensitive receptor, which shows that noise levels from the refinery equipment subside quickly with distance from the Refinery. As noted above, an increase in noise of 0.1 dBA is not detectable to the human ear. Also as discussed above, noise levels are reduced with distance from the noise source and operational noise sources from the proposed project are not expected to overlap with other cumulative projects, especially those cumulative projects that are 1,000 feet or more from the new noise sources at the Refinery. Noise sources associated with the proposed project are not expected to occur within 1,000 feet of noise sources associated with other cumulative projects in areas where there are sensitive receptors (see Figure 5.1-1).

Because noise from the proposed project is substantially less than the applicable noise significance thresholds and noise from cumulative projects are not expected to overlap, there are no sensitive receptors located in areas where they could be subject to noise levels from both the proposed project and cumulative projects. Therefore, since the proposed project-specific noise impacts are less than significant, they are not considered to be cumulatively considerable and would not contribute to a significant adverse cumulative noise impact during operation.

5.2.5.4 Mitigation Measures and Cumulative Impacts

Mitigation is not required because potential cumulative noise impacts of the proposed project are less than significant. No residual cumulative impacts are expected.

5.2.6 SOLID AND HAZARDOUS WASTE

5.2.6.1 Scope of Analysis

The geographic scope for cumulative solid and hazardous waste would be the County of Los Angeles as waste is managed at the County level. The analysis uses the same thresholds of significance as the proposed project-specific analysis (Section 4.6.1) and assesses the potential of the proposed project, along with other cumulative projects within the geographic scope of the project (Carson and Wilmington areas), to cause a substantial increase in solid and hazardous waste as a result of project construction activities and operational activities.

5.2.6.2 Construction

5.2.6.2.1 Contributions of Cumulative Projects

Solid Waste: A number of the past, present, and reasonably foreseeable future cumulative projects identified in Table 5.5-1 have the potential to generate additional solid and hazardous waste during construction activities. As noted in Table 5.2-12, none of the cumulative projects were expected to generate significant adverse solid waste impacts during construction.

Several other projects (i.e., projects where sufficient solid/hazardous waste information is not available and not included in Table 5.2-12) would result in the demolition of existing structures, e.g., ICTF (#7), 21801 Vera Street (#14), and Winn Hyundai and Chevrolet (#17), which could generate additional solid waste associated with demolition activities. Demolition wastes are often recycled including concrete and metal components, which minimize the potential impact to solid waste landfills. Valero Cogen (#8), Shell Revitalization Project (#16), Shell Carson Facility E10 Project (#22), and Carousel Tract (#23) projects are expected to cumulatively generate up to approximately 10,200 cubic yards of solid waste, which is less than the remaining capacity of the solid waste landfills.. In general, construction activities represent one-time waste disposal requirements which typically cease following construction activities. Therefore, the cumulative projects are not expected to generate significant quantities of solid waste during construction activities.

TABLE 5.2-12

Cumulative Projects – Summary of Solid/Hazardous Waste Impacts

No.	Project	Solid Waste Construction	Solid Waste Operation	Hazardous Waste Construction	Hazardous Waste Operation
4	Southern California International Gateway Project[(a)]	~~MNS~~	~~MNS~~	~~NS~~	~~NS~~
8	Valero Cogen[(b)]	NS	NS	NS	NS
10	LAUSD Span K-8 School[(c)]	NS	NS	NS	NS
12	Warren E&P[(d)]	NS	NS	NS	NS
16	Shell Revitalization Project[(e)]	NA	NS	NA	NA
19	Wilmington/Interstate 405[(f)]	MNS	NA	NA	NA
21	Phillips 66 Crude Oil Storage[(g)]	NS	NS	NS	NS
22	Shell Carson Facility E10 Project[(h)]	NS	NS	NS	NS
23	Carousel Tract[(i)]	NS	NA	NA	NA
32	CSULB Foundation Retail Project[(j)]	NS	NS	NA	NA

Key: NA = not applicable, resource was not evaluated; NS – not significant.

(a) POLA, 2013 ~~(The environmental analysis has been challenged and is being litigated)~~(FEIR invalidated)
(b) SCAQMD, 2014a
(c) LAUSD, 2007
(d) SCAQMD, 2014b
(e) City of Carson, 2014
(f) Caltrans, 2008
(g) SCAQMD 2014c
(h) SCAQMD, 2012
(i) RWQCB, 2014
(j) City of Long Beach, 2014

Hazardous Waste: Cumulative projects could result in the generation of contaminated soils (which could be either solid or hazardous waste) including the Consolidated Slip Restoration Project (#3), WesPac (#9), Shell Oil Products Revitalization Project (#16); Phillips 66 Crude Tank Project (#21); Shell Carson Ethanol Project (#23), Carousel Tract (#25), and other independent Tesoro Projects (#36-45). Nonetheless, based on the available information in the CEQA documents, it is expected that the cumulative projects will generate up to 204,100 cubic yards of hazardous waste. There is available capacity at hazardous waste landfills to accommodate the waste. Therefore, the cumulative projects are not expected to generate significant quantities of hazardous waste during construction activities.

5.2.6.2.2 Contributions of the Proposed Project

Solid Waste: As noted in Section 4.6.2, demolition of a substantial number of refinery structures is not expected to occur. The proposed project, does, however, include the demolition and removal of two existing storage tanks and affected existing piping at the Wilmington

Operations. The tanks and piping are constructed of steel. Because steel is a commodity, it would be sent for recycling in lieu of disposal in a landfill. The concrete foundations that support the existing tanks would generate an estimate 265 cubic yards that would be transported off-site for crushing and recycling or disposal at inert or municipal landfills.

As shown in Table 4.6-1, the proposed project has the potential to generate up to 206,953 cubic yards of non-hazardous construction soil waste, which can be disposed of in Class III landfills. Solid waste would be stored on-site and daily shipments would be scheduled to avoid exceeding any landfill's permitted daily capacity, if necessary. The total remaining permitted Class III landfill capacity in southern California is estimated to be approximately 129.2 million tons (about 2,584 million cubic yards). Therefore, landfills in southern California have the capacity to accept the solid waste produced during the construction phase of the proposed project on a one-time basis (see Table 3.6-6). Following the construction phase, these waste streams will cease and the project would not generate a continuous long-term waste stream. Therefore, because the proposed project impacts on solid wastes during construction activities are less than significant, they are not considered to be cumulatively considerable and are not considered to contribute to significant adverse cumulative solid waste impacts.

Hazardous Waste: Site preparation, grading, and construction activities for the proposed project have the potential to encounter contaminated soils. It is estimated that the proposed project has the potential to uncover a total of approximately 290,148 cubic yards of contaminated soil, which may require removal and disposal; of that, approximately 83,213 cubic yards would be hazardous materials, and the remainder is expected to be non-hazardous materials (see Table 4.6-1). Therefore, up to about 83,000 cubic yards of contaminated soils could be disposed of as hazardous wastes. Tesoro would consider the type and extent of contamination and explore the variety of options available for disposal and remediation, which could include *in situ*, on-site, and off-site treatment (e.g., incineration, soil vapor extraction, bioremediation). In the event that the material still requires disposal (i.e., cannot be treated/remediated), the Kettleman Hills facility has sufficient available capacity (5,000,000 cubic yards) and the Clean Harbors Buttonwillow facility has available capacity (over 8,000,000 cubic yards) to accept the total amount of one-time contaminated soil generated by construction activities associated with the proposed project. The landfills in California have the capacity to accept hazardous waste generated during the construction phase of the proposed project on a one-time basis. Following the construction phase, these waste streams will cease and the project would not generate a continuous long-term waste stream. Therefore, because the proposed project's solid/hazardous waste impacts were concluded to be less than the applicable solid waste significance threshold, they are not considered to be cumulatively considerable and are not considered to contribute to significant adverse cumulative solid/hazardous waste impacts.

5.2.6.3 Operations

5.2.6.3.1 Contributions of Cumulative Projects

Solid Waste: Similar to the proposed project, the cumulative projects, including commercial and industrial facilities, in the project area have the potential to generate solid waste consisting of non-hazardous materials, such as paper products and other miscellaneous municipal solid waste disposed by on-site staff. As discussed in Section 3.6.1, non-hazardous solid waste is disposed of at several landfills in Los Angeles County. Based on the results of the analysis and considering permit restrictions, the total remaining permitted Class III landfill capacity in the County is estimated at 129.2 million tons as of December 31, 2012 (see Table 3.6-6) (County of Los Angeles, 2013). The cumulative projects in Table 5.1-1 all generate, or will generate, solid waste that must be disposed of in landfills for the foreseeable future. As shown in Table 5.2-12, none of the cumulative projects were expected to generate significant adverse solid waste impacts.

Hazardous Waste: As noted in Table 5.2-12, none of the cumulative projects were expected to result in significant hazardous waste impacts associated with operational activities. Most of the cumulative projects are not expected to generate hazardous waste on a routine basis. Therefore, impacts of the cumulative projects on hazardous waste generation would be less than significant.

5.2.6.3.2 Contributions of the Proposed Project

Solid Waste: As discussed in Section 4.6.3, the average annual amount of solid waste is not expected to change because there would be no change in the number of workers and refinery units do not typically generate solid waste. Therefore, solid waste impacts from the proposed project are less than significant, not cumulatively considerable, and do not contribute to significant adverse solid waste impacts.

Hazardous Waste: The proposed new and modified equipment associated with the proposed project will perform similar functions as the existing equipment. The proposed project will result in an increase in spent catalyst associated with the operation of the SARP and spent caustic associated with operation of the Wet Jet Treater, and SARP. As explained in Section 4.6.3, both of these waste streams are expected to be recycled and, therefore, would not impact hazardous waste landfill facilities.

While operation of the proposed project may generate hazardous waste streams (e.g., sludge for tanks during maintenance activities), those waste streams are expected to be reused or recycled into the DCUs. Therefore, operation of the proposed project is not expected to require additional waste disposal capacity and is not expected to interfere or undermine the Tesoro Refinery's ability to comply with existing federal, state, and local regulations for solid and hazardous waste handling and disposal. Significant hazardous waste impacts are not expected from operation of the proposed project. Therefore, potential hazardous waste impacts from the proposed project during operation are expected to be less than significant, are not considered to be cumulatively considerable, and would not contribute to significant adverse cumulative hazardous waste impacts.

5.2.6.4 Mitigation Measures and Cumulative Impacts

Mitigation is not required because the solid/hazardous waste impacts of the proposed project are less than significant and are not considered to cumulatively considerable. No significant adverse cumulative solid/hazardous waste impacts are expected.

5.2.7 TRANSPORTATION AND TRAFFIC

5.2.7.1 Scope of Analysis

The analysis of transportation and traffic impacts includes streets and intersections that would be impacted by construction and operational activities associated with the proposed project at the Tesoro Carson and Wilmington Operations and generally includes the area shown in Figure 3.7-1. Therefore, the scope of the cumulative transportation and traffic analysis is limited to the road segments potentially impacted by the proposed project as evaluated in Section 4.7. Thresholds of significance used in the cumulative analysis are the same as those used for the project analysis in Section 4.7.1.

5.2.7.2 Contributions of Cumulative Projects

5.2.7.2.1 Construction

Construction activities associated with the cumulative projects could result in temporary increases in traffic volumes and roadway disruptions in the vicinity of the Tesoro Los Angeles Refinery, including short-term, temporary impacts at selected roadway links, intersections and ramps. However, once construction is completed, no further construction traffic impacts would occur. Sufficient information to prepare a cumulative construction traffic analysis is not available for most of the related proposed project. The traffic analysis prepared for the construction portion of the proposed project includes construction activities associated with the I-405/Wilmington Avenue on ramps along with traffic associated with the proposed project, providing an estimation of cumulative traffic impacts (see Table 4.7-3). As shown in Table 4.7-3, the LOS at all intersections is expected to be LOS A, B or C, except Interstate 405/Wilmington Avenue Southbound Ramps during the morning peak hour. The construction-related trips are forecast to result in a significant impact during construction of the proposed project at the Interstate 405/Wilmington Avenue Southbound Ramps under their pre-construction configuration of the freeway ramps. This is due to the large number of project-related trips utilizing the southbound ramp to access the proposed project site in the a.m. peak hour. Mitigation measure TT-1 has been imposed that would require that construction traffic from Tesoro avoid this intersection, which will help mitigate the cumulative traffic impacts.

5.2.7.2.2 Operation

The cumulative traffic impacts from the cumulative projects have been estimated in the traffic analysis (see Table 5.2-13 and Appendix E for further details). Year 2021 conditions without construction traffic from the proposed project were forecasted by applying a 0.4 percent per year growth as calculated from the SCAG travel demand model and are shown in Table 5.2-13. It was assumed that the traffic forecast in Table 5.2-13 includes traffic from all projects in the local area and includes the estimated increase of 10 trucks per day from the proposed project. There will be no increase in permanent workers associated with the proposed project. As shown in Table 5.2-13, assuming a 0.4 percent growth in traffic, no intersections in the traffic study would operate at a LOS worse than LOS C. Therefore, because LOS C represents generally represents good traffic operating conditions, the potential cumulative traffic impacts of the cumulative projects are expected to be less than significant on transportation and circulation.

5.2.7.3 Contributions of the Proposed Project

5.2.7.3.1 Construction

As shown in Table 4.7-3, the LOS at all intersections during the proposed project construction activities is expected to be LOS A, B or C, except Wilmington Ave./Interstate 405 SB Ramps during the morning peak hour. The construction-related trips from the proposed project are forecast to result in a significant traffic impact during construction conditions at the Wilmington Ave./Interstate 405 Southbound Ramps because of the number of construction workers anticipated to be needed during the peak construction period and the fact that this intersection is currently under construction. Although construction traffic impacts from the proposed project were concluded to be significant at the Wilmington Ave./Interstate 405 Southbound Ramps during the peak morning traffic period, a mitigation measure was identified and will be required to be implemented during construction, which reduce construction traffic impacts from the proposed project at the Wilmington Ave./Interstate 405 Southbound Ramps to less than significant. Therefore, the proposed project traffic impacts during construction activities are not cumulatively considerable and do not contribute to significant adverse cumulative traffic impacts.

5.2.7.3.2 Operation

The NOP/IS (see Appendix A) concluded that the traffic impacts associated with the operation of the proposed project would be less than significant as no increase in workers would be expected on a permanent basis and a maximum ten trucks per day would be added, but truck miles traveled <u>for acid shipments </u>would be reduced once the SARP is completed. Therefore, the proposed project traffic impacts during operational activities are not cumulatively considerable and do not contribute to significant adverse cumulative traffic impacts.

5.2.7.4 Mitigation Measures and Cumulative Impacts

As noted above construction traffic impacts from the proposed project at the Wilmington Ave./Interstate 405 Southbound Ramps during the peak morning traffic period were concluded to be significant. However, mitigation measures were identified and will be required to be implemented during the construction period. Mitigation measure TT-1 is required and is expected to substantially reduce the number of construction related trips from the proposed project at the Wilmington Avenue/Interstate 405 Southbound Ramps intersection prior to the completion of the Interstate 405/Wilmington Avenue Interchange Project. TT-1 requires the applicant to implement a traffic management plan that requires project workers to avoid the Wilmington Avenue/Interstate 405 Southbound Ramps intersection during morning peak travel periods (while that onramp is under construction) by traveling either outside of the morning peak travel time or along alternative routes. The impacts of the proposed project on construction traffic and circulation are expected to be less than significant following implementation of mitigation measure TT-1. Therefore, the proposed project's construction traffic impacts are not considered to be cumulatively considerable and would not contribute to significant adverse cumulative traffic impacts.

TABLE 5.2-13

YEAR 2021 – CUMULATIVE TRAFFIC ANALYSIS

Intersection		Year 2020 Without Project						Year 2020 With Project Operations						A.M. Change in V/C or Delay	P.M. Change in V/C or Delay	Significant Impact?
		A.M. Peak Hour			P.M. Peak Hour			A.M. Peak Hour			P.M. Peak Hour					
		V/C Ratio	Delay (sec)	LOS	V/C Ratio	Delay (sec)	LOS	V/C Ratio	Delay (sec)	LOS	V/C Ratio	Delay (sec)	LOS			
1	Wilmington Ave/ Interstate 405 NB Ramps	0.512	21.7	C	0.420	18.4	B	0.512	21.7	C	0.420	18.4	B	0.0 s	0.0 s	No
2	Wilmington Ave/ Interstate 405 SB Ramps	0.364	21.8	C	0.362	15.7	B	0.365	21.8	C	0.363	15.8	B	0.0 s	0.1 s	No
3	Wilmington Ave/223rd St	0.656	-	B	0.703	-	C	0.657	-	B	0.703	-	C	0.001	0.0	No
4	Alameda St./Interstate 405 NB Ramps	0.687	23.4	C	0.681	23.5	C	0.687	23.4	C	0.682	23.6	C	0.0 s	0.1 s	No
5	Alameda St./223rd St (along Alameda St.)	0.470	-	A	0.581	-	A	0.471	-	A	0.581	-	A	0.001	0.0	No
6	Alameda St./223rd St (along 223rd St)	0.355	-	A	0.647	-	B	0.355	-	A	0.647	-	B	0.0	0.0	No
7	Alameda St./Sepulveda Blvd (along Alameda St.)	0.380	-	A	0.548	-	A	0.381	-	A	0.549	-	A	0.001	0.001	No
8	Alameda St./Sepulveda Blvd (along Sepulveda Blvd)	0.422	-	A	0.758	-	C	0.423	-	A	0.759	-	C	0.001	0.001	No
9	Interstate 405 SB Ramps/223rd St	0.484	23.5	C	0.514	19.1	B	0.484	23.5	C	0.514	19.1	B	0.0 s	0.0 s	No
10	Terminal Island Fwy (SR-103)/Sepulveda Blvd	0.396	-	A	0.590	-	A	0.397	-	A	0.591	-	A	0.001	0.001	No
11	Santa Fe Ave/Sepulveda Blvd	0.636	-	C	0.798	-	C	0.637	-	B	0.799	-	C	0.001	0.001	No
12	Interstate 710 SB Ramps/Willow St	Uncontrolled Intersection														No
13	Interstate 710 NB Ramps/Willow St	Uncontrolled Intersection														No

Notes: V/C = Volume to Capacity Ratio, LOS = Level of Service, Delay = Average Vehicle Delay (Seconds)

CHAPTER 6

PROJECT ALTERNATIVES

Introduction
Alternatives Rejected as Infeasible
Description of Project Alternatives
Environmental Impacts from the Project Alternatives
Conclusion

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6.0 PROJECT ALTERNATIVES

6.1 INTRODUCTION

Chapter 6 of this EIR provides a discussion of alternatives to the proposed project as required by CEQA. CEQA requires that an EIR describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project, but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives (CEQA Guidelines §15126.6(a)). In addition, though the range of alternatives required in an EIR is governed by a “rule of reason” that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice (CEQA Guidelines §15126.6(f)), they need not include every conceivable project alternative (CEQA Guidelines, §15126.6(a)). A CEQA document need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative (CEQA Guidelines §15126.6(f)(3)). The key issue is whether the selection and discussion of alternatives fosters informed decision making and public participation.

Alternatives presented in this chapter were developed by identifying alternatives that may achieve most or some of the objectives of the proposed project. The alternatives were limited to the area of the existing Refinery, as the objectives of the proposed project are to further develop and integrate the Tesoro Wilmington and Carson Operations. The alternatives to the proposed project were developed by modifying specific components of the proposed project taking into consideration the project’s limitations as to space, permitting requirements, and engineering constraints. The rationale for selecting specific components of the proposed project to generate feasible alternatives is based on CEQA’s requirements to present “realistic” alternatives, that is, alternatives that can actually be implemented. Consequently, unless otherwise stated, each project alternative described below contains some of the same components as the proposed project.

One of the key elements of identifying alternatives to a proposed project is whether or not they can feasibly accomplish most of the basic objectives of the proposed project. There are multiple objectives for the proposed project that include modifications to further integrate the Tesoro Carson and Wilmington Operations so that consolidated operations can be optimized for improved operation, reduction of GHG and criteria pollutant emissions, improved energy efficiency, and environmental compliance requirements. The objectives of the proposed project include the following:

- Improving process efficiency through integration while maintaining the overall production capability of transportation fuels. Making process modifications that improve efficiency and enable shutdown of the Wilmington Operations FCCU prior to the next scheduled FCCU turnaround, currently anticipated to occur in 2017, providing substantial emission reductions and reducing carbon intensity.

- Recovering and upgrading distillate range material from FCCU feeds. Tesoro proposes to achieve this objective by modifying 51 Vacuum Unit, and the HCU at Carson Operations, and the HTU-4 and HCU modifications at Wilmington Operations. Recovering distillate from FCCU feed enables shut down of the Wilmington Operations FCCU since the Carson Operations FCCU has sufficient capacity to process the FCCU feed that remains after distillate recovery.

- Complying with federal, state, and local rules and regulations. Tesoro proposes to achieve this objective by: (1) meeting the U.S. EPA Tier 3 gasoline specifications; and (2) reducing Refinery NOx, SOx, and GHG emissions through proposed process modifications that improve efficiency, enable shutdown of the Wilmington Operations FCCU, and lower carbon intensity.

- Improving financial viability for the newly integrated Tesoro Los Angeles Refinery and the local community. Tesoro proposes to achieve this objective by: (1) reducing future operating, capital, turnaround, and environmental compliance costs, primarily by shutting down the Wilmington Operations FCCU; (2) improving electrical supply reliability; (3) improving integrated Refinery transportation fuel production flexibility between gasoline and distillate products to respond to changes in market demand, including the capability to produce 100 percent of the refinery gasoline production as CARB compliant gasoline; and (4) providing sustainable local jobs and tax revenue for the community.

- Integrating Carson and Wilmington Operations. Tesoro proposes to achieve this objective by installing the Interconnecting Pipelines to allow efficient transfer of hydrocarbons between the facilities to allow gasoline blending optimization, process unit feedstock optimization, and increased diesel production.

- Increasing overall Refinery processing efficiency. Tesoro proposes to achieve this objective by: (1) adding a SARP at the Wilmington Operations to regenerate sulfuric acid on-site; (2) adding a Wet Jet Treater to improve jet fuel quality; (3) upgrading and adding facilities to recover and treat propane for commercial sales; and (4) upgrading existing LPG rail facilities to enable fast unloading of railcars.

- Improving efficiency of water-borne crude oil receipt and marine vessel unloading. Unloading crude oil from marine vessels without delay will reduce vessel emissions at the Port of Long Beach. Tesoro proposes to achieve this objective by constructing six new 500,000 barrel tanks at the Carson Crude Terminal and replacing two existing 80,000 barrel crude oil tanks at the Wilmington Operations with two 300,000 barrel tanks. Piping within the Carson Crude Terminal will be installed to connect the six new 500,000 barrel tanks to existing pipelines to the Carson Operations and Marine Terminal 1. The two new 300,000 barrel tanks will be connected to existing pipelines from the Wilmington Long Beach Terminal. Within the confines of the Wilmington Operations, the existing 12-inch diameter piping will be replaced with 24-inch diameter piping to connect the replacement tanks to the Wilmington Operations.

Aside from the alternatives described in Section 6.3 below, no other project alternatives were identified that met most of the objectives of the proposed project, while substantially reducing significant adverse environmental impacts.

6.2 ALTERNATIVES REJECTED AS INFEASABLE

In accordance with CEQA Guidelines §15126.6(c), a CEQA document should identify any alternatives that were considered by the lead agency, but were rejected as infeasible during the scoping process and briefly explain the reason underlying the lead agency's determination. Section 15126.6(c) also states that among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (1) failure to meet most of the basic project objectives; (2) infeasibility; or (3) inability to avoid significant environmental impacts. Furthermore, CEQA Guidelines §15126.6(f)(2)(B) indicates that if the lead agency concludes that no feasible alternative locations for the project exist, it must disclose the reasons for this conclusion, and should include the reasons in the EIR. See Section 6.2.1 for why an alternative site is not a feasible alternative. The specialized nature of the proposed project does not provide a wide selection of feasible project design alternatives since crude oil refining requires certain specialized equipment and most of the primary specialized equipment are already operating at the Tesoro Refinery.

6.2.1 ALTERNATIVE SITES

An alternative location to the Tesoro Refinery site is not feasible as the proposed project consists of modifications to an existing Refinery that contains necessary processing units; natural gas, water, and electric transmission infrastructures; crude oil and petroleum product transportation infrastructure; and the appropriate land use designation necessary to support the proposed project. In addition, the Carson and Wilmington Operations are industrial facilities at fixed locations in the City of Carson and the Wilmington area in the City of Los Angeles. Operational equipment and infrastructure located at the proposed project site are also fixed and, generally, cannot be moved. Advantages of the existing Refinery site would be lost if another location were proposed, e.g., shut down of the Wilmington Operations FCCU. The development of a new refinery in an alternative location would require substantially more equipment, construction, and potentially generate more or substantially greater impacts in more environmental categories (e.g., air quality, energy, hazards/hazardous materials, hydrology/water quality, land use, noise, and traffic) than would occur under the proposed project. Therefore, an alternative refinery site for the proposed project is not feasible.

6.3 DESCRIPTION OF PROJECT ALTERNATIVES

6.3.1 ALTERNATIVE 1 - NO PROJECT ALTERNATIVE

CEQA Guidelines §15126.6(e) requires evaluation of a "No Project Alternative." Under the No Project Alternative, the proposed project would not occur and the Wilmington and Carson Operations would remain as they exist today. Tesoro would not make the modifications necessary to meet regulatory mandates. The Refinery would continue to operate with a minimal amount of integration. Modifications to the Wilmington Operations would not move forward so that the proposed modifications to the HCU, CRU-3, HTU-1, HTU-2, and HTU-4 would not occur. The new PSTU and SARP also would not be constructed. The change to the DCU Heater H-100 would also not occur. Crude tank modifications at the Wilmington Operations would not occur and the crude unloading rate from the marine terminal would remain unchanged at 5,000 bbl/hr. Finally, the Wilmington Operations FCCU would not be shut down because none of the refinery modifications needed for that to occur would be made.

Under Alternative 1, modifications to the Carson Operations would not occur including modifications to No. 51 Vacuum Unit, HCU, LHU, NHDS Unit, Naphtha Isomerization Unit, Alkylation Unit, and Mid-Barrel Distillate Treater. The new Wet Jet Treater at the Carson Operations would not be installed and the six new crude tanks would also not be installed.

Other refinery integration activities would also not occur. Pipelines would not be built to transport material between the Wilmington and Carson Operations and the electrical connection from the Carson Operations to the Wilmington Operations would not be completed. Finally, no modifications would be made to the LPG Rail Car Unloading facilities.

The proposed project includes some components to comply with federal Tier 3 gasoline specification requirements. As such, the No Project Alternative would not include the federal Tier 3 requirements, which means the Refinery could be in violation of these requirements in the future. For this reason, a No Project Alternative could be considered infeasible. In spite of this, the No Project Alternative is included herein, and the relative merits of this alternative are evaluated and compared to the proposed project as required by CEQA.

6.3.2 ALTERNATIVE 2 – NEW FFHDS FRACTIONATOR AT CARSON OPERATIONS AND A NEW DIESEL HYDROTREATER AT WILMINGTON OPERATIONS

Alternative 2 includes installing one new Fractionator at the tail end of the Carson Operations Fluid Feed Hydrodesulfurization (FFHDS) Unit and one new Diesel Hydrotreater at Wilmington Operations to achieve the project objective of recovering and upgrading distillate range material from FCCU feed.

An FFHDS Unit is a hydrotreating unit for FCCU feed. The FFHDS is a process unit that typically uses a heavy metal-based catalyst and hydrogen to reduce aromatic compounds and impurities such as sulfur in the FCCU feed. Removing sulfur from the FCCU feed and diesel streams will reduce the sulfur in the products, thus, helping to comply with U.S. EPA sulfur limitations on fuels. At Carson Operations, a new FFHDS fractionator could recover approximately 8,000 to 10,000 bbl/day of jet fuel and approximately 15,000 to 20,000 bbl/day of diesel from the gas oil feed to the Carson FCCU. The FFHDS Fractionator would include one 200 mmBtu/hr natural gas fired heater with economizer and steam generator, one fractionator, one jet stripper, one overhead receiver, as many as 14 associated electrically driven pumps, 14 heat exchangers, one jet coalescer, one jet salt dryer and associated piping and instrumentation. Additionally, the FFHDS could hydrotreat up to an additional 15,000 bbl/day of jet fuel, some of which would need to be removed in the new fractionator. A new feed line would be routed from the existing FFHDS stripper to the new fractionator. Gas oil and diesel product lines would be routed from the new Carson Operations FFHDS fractionator to the Carson Operations FCCU and the Hydrocrackers at both the Wilmington and Carson Operations, respectively. Jet fuel would be routed to storage tanks for blending.

A Diesel Hydrotreater is a process unit that typically uses a heavy metal-based catalyst and hydrogen to reduce aromatic compounds and impurities such as sulfur from diesel. Alternative 2 would include one new 30,000 bbl/day Diesel Hydrotreater at the Wilmington Operations to remove sulfur from the recovered diesel streams. The Diesel Hydrotreater would include one 39 mmBtu/hr BACT compliant fuel gas fired charge heater, one 39 mmBtu/hr BACT compliant fuel gas fired stripper reboiler, one feed drum, one reactor, one fractionator tower, three product separators, one electrically driven recycle compressor and as many as six associated electrically driven pumps, six heat exchangers and associated piping and instrumentation. Diesel recovered by the proposed project would be routed to the new Diesel Hydrotreater. Sour water would be routed to existing wastewater treating facilities. Treated diesel would be routed to existing product storage tanks.

The new FFHDS Fractionator and Diesel Hydrotreater would be constructed instead of making modifications to some of the existing Refinery units. For example, under Alternative 2, the new fractionator would be built instead of making modifications to the Wilmington Operations HCU and HTU-4, and No. 51 Vacuum Unit and HCU at the Carson Operations.

Under Alternative 2, the remainder of the proposed project components would remain unchanged. Alternative 2 would include the following project components from the Wilmington Operations: DCU H-100 modifications; CRU-3 modifications; new PSTU; HTU-1 and HTU-2 modifications; new SARP; and modifications to existing storage tanks. Under Alternative 2, the FCCU at the Wilmington Operations would be shutdown. Alternative 2 would also include the following project components at the Carson Operations: New Wet Jet Treater; LHU modifications; NHDS Unit modifications; Naphtha Isomerization Unit modifications; Alkylation Unit modifications; Mid-Barrel Distillate Treater; Steam System modifications; and installation of new crude storage tanks. In addition, Alternative 2 would also include the proposed Interconnecting Pipelines, the electrical intertie and the LPG Unloading rack modifications.

6.3.3 ALTERNATIVE 3 – NEW GASOLINE HYDROTREATER AT CARSON OPERATIONS

Alternative 3 would include the installation of one new Gasoline Hydrotreater at Carson Operations as an option to achieve the project objective of meeting U.S. EPA Tier 3 gasoline specifications of 10 ppm average sulfur content.

A new 50,000 bbl/day Gasoline Hydrotreater with one new Selective Hydrotreating Unit (SHU) would be installed to enable compliance with the federally mandated Tier 3 gasoline specification of 10 ppm sulfur content. A Gasoline Hydrotreater is a process unit that removes impurities such as sulfur from FCCU gasoline. The new Gasoline Hydrotreater would include one 55 mmBtu/hr BACT compliant fuel gas fired charge heater; one 65 mmBtu/Hr BACT compliant fuel gas fired stripper reboiler; one feed drum; one SHU reactor; one HDS reactor; one stripper; one stripper steam reboiler; one product separator; one electrically driven recycle compressor; one overhead receiver; and as many as six associated electrically driven pumps, six heat exchangers, two air coolers, and associated piping and instrumentation. FCCU gasoline would be routed to the new Gasoline Hydrotreater. Sour water would be routed to existing wastewater treating facilities.

Under Alternative 3, the new Gasoline Hydrotreater/SHU would be built instead of making modifications to HTU-1 and HTU-2 at the Wilmington Operations and LHU, NHDS Unit, and the Mid-Barrel Treater at the Carson Operations.

The remainder of the project components would remain unchanged. Alternative 3 would include the following project components from the Wilmington Operations: DCU H-100 modifications; CRU-3 modifications; new PSTU; HTU-4 modifications; new SARP; and modifications to existing storage tanks. Under Alternative 3, the FCCU at the Wilmington Operations would also be shutdown. Alternative 3 would also include the following project components at the Carson Operations: No. 51 Vacuum Unit modifications; New Wet Jet Treater; HCU modifications; Naphtha Isomerization Unit modifications; Steam System modifications; and new crude storage tanks. In addition, Alternative 3 would also include the proposed Interconnecting Pipelines, the electrical intertie and the LPG Unloading rack modifications.

6.3.4 ALTERNATIVE 4 - INTERCONNECTING PIPELINE AND NEW GASOLINE HYDROTREATER AT CARSON OPERATIONS

Alternative 4 would eliminate all of the proposed project components, except the Interconnecting Pipeline. In addition, Alternative 4 would include the installation of one new Gasoline Hydrotreater/SHU at Carson Operations as an option to achieve the project objective of meeting U.S. EPA Tier 3 gasoline specifications of 10 ppm average sulfur content. A new 50,000 bbl/day Gasoline Hydrotreater with a new SHU would be installed to enable compliance with the federally mandated Tier 3 gasoline specification of 10 ppm sulfur content. The new Gasoline Hydrotreater would include one 55 mmBtu/hr BACT compliant fuel gas-fired charge heater; one 65 mmBtu/Hr BACT compliant fuel gas-fired stripper reboiler; one feed drum; one SHU reactor; one HDS reactor; one stripper; one stripper steam reboiler; one product separator; one electrically driven recycle compressor; one overhead receiver; and as many as six associated electrically driven pumps, six heat exchangers, two air coolers, and associated piping and instrumentation. FCCU gasoline would be routed to the new Gasoline Hydrotreater/SHU. Sour water would be routed to existing wastewater treating facilities. Under Alternative 4, the Wilmington Operations FCCU would not be shut down because none of the refinery modifications needed for that to occur would be made. Therefore, the Wilmington Operations FCCU would remain operational.

6.3.5 ALTERNATIVE 5 – ALTERNATIVE CONSTRUCTION SCHEDULE

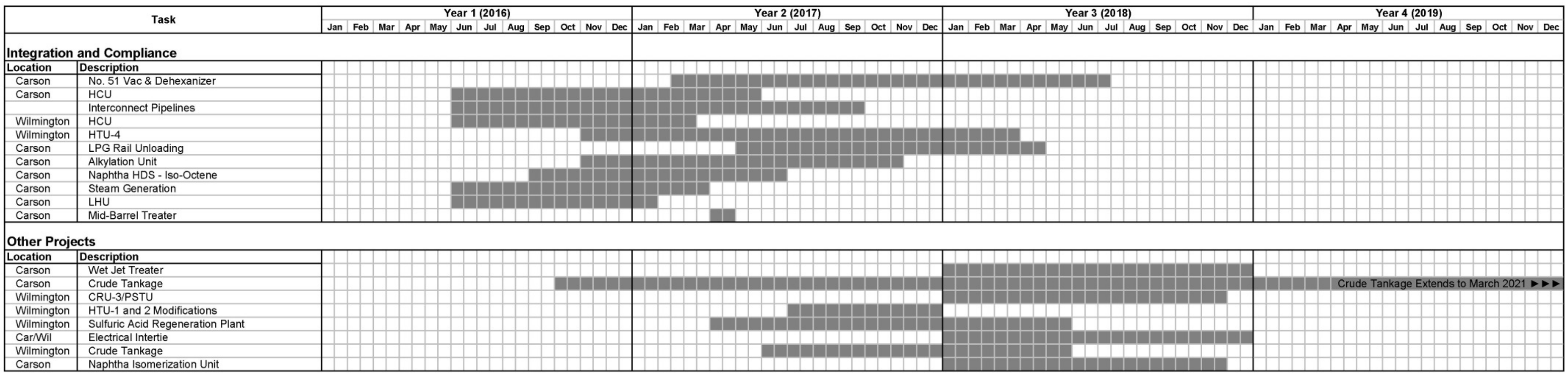
Construction emissions for the proposed project are significant for VOC~~, CO,~~ and NOx. Alternative 5 would provide an alternative construction schedule to reduce construction emission impacts. The most likely method of reducing daily construction emissions would be to remove or reduce the construction overlap between the various project components.

The proposed project construction schedule is driven by the turnaround schedule for the Wilmington Operations FCCU. It is Tesoro's goal to shut down the Wilmington Operations FCCU prior to the next turnaround, which is scheduled in 2017. Operating the unit until the next scheduled turnaround allows for the most effective use of the unit until routine maintenance is needed. It also meets the objective of timely achieving emissions reductions. Turnarounds are scheduled to optimize the operation of the equipment. In order for the Wilmington Operations FCCU shutdown to happen, the portions of the proposed project modifications that include recovering and upgrading distillate range material from FCCU feeds, the Carson Operations Alkylation Unit, supporting unit upgrades (NHDS, LPG Unloading and utilities) and the Interconnecting Pipelines must be in place. Scheduling refinery turnarounds is an involved process with many considerations and restrictions that make rescheduling a unit turnaround, as would be necessary under this alternative, difficult. Typically, inspection and maintenance activities are extensive and are conducted 24 hours per day in order to minimize refinery unit downtime. Under Alternative 5, the Wilmington Operations FCCU would conduct a turnaround in 2017 and then continue operating through the next operating cycle, until 2021. The certification of the FEIR has been delayed, which has delayed the implementation schedule for the proposed project. The delay may cause the Wilmington Operations FCCU turnaround to be postponed until 2018. The construction schedule is expected to commence following certification of the FEIR and issuance of permits. The dates used here and shown in Figure 6.3-1 will adjust accordingly (i.e., the Wilmington Operations FCCU would continue to operate until 2022).

As shown in Figure 2-18, the proposed project schedule includes the project components expected to be under construction during 2016 through 2021. Construction activities associated with the proposed project are scheduled so that most of the construction would be completed prior to the 2017 turnaround, when final construction/connections will be completed while the affected units are down. The majority of the proposed project construction activities would be occurring on units that are scheduled for turnarounds. The majority of the project elements must be complete prior to mid-2017 to enable the Wilmington Operations FCCU shutdown in 2017.

Alternative 5 includes a modified construction schedule (compare Figure 6.3-1 with Figure 2-18) so that construction of the proposed project components does not overlap as much as they do under the proposed project. Construction of a number of units would be delayed to later in the proposed project schedule. These units include the LPG Rail Unloading facilities, Naphtha HDS Unit, Mid-Barrel Treater, and HTU-1 and HTU-2 modifications.

However, under Alternative 5, sufficient construction activities would not be completed by early 2017 so that the Wilmington Operations FCCU would continue to operate until the next turnaround period, estimated to occur in approximately 2021.



Note: Wilmington DCU H100 and Carson FCCU Modifications are operational changes only and have no construction schedule.
Transitional Period is the 90-day period prior to the shutdown of the Wilmington Operations FCCU will occur in 2021.

FIGURE 6.3-1

Alternative 5 – Alternative Construction Schedule

6.4 ENVIRONMENTAL IMPACTS OF PROJECT ALTERNATIVES

6.4.1 ALTERNATIVE 1 – NO PROJECT ALTERNATIVE

Air Quality: Air quality impacts associated with construction of the proposed project (see Table 4.2-2) would be eliminated under Alternative 1 because no construction activities would be required (see Table 6.4-1). Construction emissions associated with the proposed project were concluded to be significant for VOC and NOx, as well as the LST for NO_2 emissions. Under Alternative 1, air quality impacts from construction would be eliminated; therefore, air quality impacts would be less than significant for all pollutants and less than the proposed project.

TABLE 6.4-1

Construction Criteria Pollutant Air Emissions Under Alternative 1

Sources	Emissions (lbs/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5[(a)]
Total Proposed Project Emissions[(a)]	106.65	515.54	575.73	1.41	68.55	38.67
Significance Threshold	75	550	100	150	150	55
Significant?	**Yes**	**No**	**Yes**	**No**	**No**	**No**
Alternative Construction Emissions[(b)]	0.00	0.00	0.00	0.00	0.00	0.00

Note: Negative numbers represent emission reductions.
(a) See Table 4.2-2 for further details.
(b) No construction would occur under Alternative 1.

The operational emissions increases associated with the new and modified units would also be eliminated under Alternative 1. Under Alternative 1, there would be no emission increases associated with DCU Heater H-100, HCU heaters H-300/301, the SARP, new storage tanks, or fugitive emissions increases at the Wilmington Operations (CRU-3, HCU, HTU-1, HTU-2, or HTU-4) or Carson Operations (No. 51 Vacuum Unit, Alkylation Unit, HCU, LHU, LPG Railcar Unloading facilities, Mid Barrel Distillate Treater, Naphtha Isomerization Unit, NHDS Unit, and Wet Jet Treater). Mobile source emission increases associated with the proposed project would also be eliminated under Alternative 1.

Under Alternative 1, the net operational emission reduction benefits of the proposed project would not occur. For example, the Wilmington Operations FCCU would not be shut down because none of the Refinery modifications needed for that to occur would be made. As a result, the local emission reductions associated with shutting down the FCCU would not occur. The operational emissions from the proposed project were considered to be less than significant, primarily due to the shutdown of the Wilmington Operations FCCU. Similarly, the crude tank modifications at Wilmington Operations would not occur and the crude unloading rate from the marine terminal would remain unchanged at 5,000 bbl/hr. Therefore, the beneficial aspects of the proposed project associated with reduced annual ship emissions due to the increased crude offloading rate (see Table 4.2-9) would also be eliminated under Alternative 1.

Under Alternative 1, operational emissions from the Carson and Wilmington Operations would be unchanged. Consequently, Alternative 1 would not produce any operational emission increases from new or modified equipment nor would it achieve the emissions benefits (see Table 6.4-2) associated with the proposed project. Although the beneficial local emission reductions associated with the proposed project would not occur, no operational emission increases over the existing baseline would occur under Alternative 1, so that operational emissions would be less than significant. However, operational emissions under Alternative 1 would be greater than the proposed project for all pollutants except CO (see Table 4.2-4).

TABLE 6.4-2

Operational Criteria Pollutant Air Emissions Under Alternative 1

Sources	**Emissions (lbs/day)**					
	VOC	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5[(a)]**
Total Proposed Project Emissions[(a)]	49.09	-589.28	38.18	<0.01	1.16	0.89
Significance Threshold	55	550	55	150	150	55
Significant?	**No**	**No**	**No**	**No**	**No**	**No**
Alternative 1 Operational Emissions[(b)]	318.96	959.79	572.59	416.38	171.35	171.35

Note: Negative numbers represent emission reductions.
(a) See Table 4.2-4 for further details.
(b) The Wilmington Operations FCCU would not be shut down so the daily emissions associated with the FCCU operation would remain. These results reflect baseline emissions at the Refinery and do not represent emission increases.

The cancer health risks from the proposed project were calculated to be less than the cancer risk significance threshold of 10 in one million (ranging from 2.1 in one million at Bethune Mary School to 9.3~~2~~ in one million at the maximum exposed individual worker). Similarly, non-cancer health risks from the proposed project were calculated to be substantially less than the acute and chronic hazard index significance thresholds of 1.0 (0.052 for the maximum acute hazard index, 0.106~~127~~ for the maximum chronic hazard index, and 0.108 for the maximum 8-hr chronic hazard index). Therefore, cancer and non-cancer health risks from the proposed project are considered to be less than significant (see Table 4.2-13). Alternative 1 would eliminate the increased TAC emissions and the associated health risks from the proposed project increases. The benefits of the reductions in TAC emissions associated with the shutdown of the Wilmington Operations FCCU and the reduced annual ship emissions due to the increased crude offloading rate were not analyzed in the EIR; however, under Alternative 1 these TAC emission reductions would not occur and cancer and non-cancer risks from these sources would remain unchanged. However, overall TAC emission impacts under Alternative 1 would be less than significant, but greater than the proposed project, as no emission reductions from the Wilmington Operations FCCU or from ship emissions would occur.

Hazards: The construction phase of the proposed project will require construction workers to excavate soil across the Wilmington Operations, the southeastern portion of the Carson Operations, and the Carson Crude Terminal, where construction of the new crude storage tanks will occur. Therefore, under the proposed project construction workers could encounter contaminated soils and groundwater during site excavation. The impacts of encountering contaminated soils or groundwater were concluded to be less than significant. However, none of the proposed project modifications would be constructed under Alternative 1, so no construction activities would occur. Therefore, no significant adverse hazard impacts from encountering contaminated soil or groundwater would occur under Alternative 1 and this impact would be less than significant and less than the potential contaminated soil or groundwater impacts from the proposed project.

Under Alternative 1 none of the proposed project modifications or new units would be constructed. The hazard impacts associated with operation of the proposed project are considered to be significant. The hazards associated with the Naphtha Isomerization Unit, new crude tanks, Interconnecting Pipelines, and SARP were considered to be significant as the hazard impacts could extend off-site. Therefore, since Alternative 1 would eliminate all proposed project modifications, potentially significant adverse hazard impacts during operation would also be eliminated, so hazard impacts during operation from Alternative 1 would be less than the hazard impacts during operation from the proposed project and less than significant.

The proposed project would require increased transportation of fresh and spent caustic and LPG, which was determined to be less than significant. Alternative 1 would not result in an increase in the transport of spent caustic or LPG; however transportation of these materials from existing sources would continue to occur under the existing Refinery operations. Due to the construction of the SARP, the proposed project would reduce the sulfuric acid transport by over 6,000 truck miles per year. Under Alternative 1, the SARP would not be constructed and the truck miles traveled to transport sulfuric acid would not be reduced. Under Alternative 1, less than significant transportation hazard impacts of the proposed project would not occur, existing transportation hazard impacts would continue, and, therefore, would be less than significant and overall less than the proposed project.

Hydrology/Water Quality: Alternative 1 would eliminate all construction activities associated with the proposed project, including the potable water demand associated with dust suppression, 10,000 gpd, and hydrostatic testing, 30,000 gpd. The total potable water demand from the proposed project during construction, 40,000 gpd, was determined to be less than significant. Under Alternative 1, this demand for potable water would not occur, would be less than significant and less than the proposed project.

Under the proposed project, water used for the hydrostatic testing new tanks and associated pipelines would be Refinery wastewater that is diverted for testing prior to discharge to the industrial sewer system. Demand for water to perform hydrostatic testing of new tanks and pipelines at both the Carson and Wilmington Operations can be supplied entirely using current wastewater streams at each operation. Using diverted wastewater will eliminate the need for using additional potable water supplies and will not increase the amount of wastewater generated by the Refinery, but will vary the discharge rate during construction. Under Alternative 1, no new tanks or pipelines would be constructed, so no wastewater would need to be diverted from existing wastewater streams, so this impact would be less than significant and less than the proposed project.

Once hydrostatic testing of new tanks and pipelines is completed under the proposed project, diverted wastewater would be returned to existing wastewater streams, treated as necessary, and then released to the LACSD sanitary sewer system. Wastewater associated with construction of the proposed project is expected to be discharged in compliance with existing IWDPs. Proposed project impacts on wastewater during construction activities were determined to be less than significant. Alternative 1 would eliminate the need for hydrostatic testing since no new tanks or pipelines would be constructed. As a result, wastewater from existing wastewater streams would not need to be diverted for any reason, so wastewater treatment and discharge would be unchanged from baseline conditions, would be less then significant for Alternative 1 and less than the proposed project.

Alternative 1 would also eliminate the increase in water use associated with the operation of the proposed project. The proposed project is expected to result in an increase in water demand of about 191,275 gpd associated with modifications to the NHDS, No. 51 Vacuum, Alkylation, and Wet Jet Treater Units, as well as indirect water demand increases associated with cooling water. The proposed project also includes shutting down the FCCU at the Wilmington Operations, which would reduce existing wash water demand by an estimated 99 gpm (about 142,560 gpd) and cooling water by an estimated 415.50 gpm (about 598,320 gpd). Therefore, the proposed project will increase the net direct water demand at the Refinery by about 76.5 gpm or about 110,160 gpd, which is less than the applicable potable water demand significance threshold of 262,820 gpd. Further, as discussed in Sections 3.4.1 and 4.4.2.1.2, the Refinery owns and operates private water wells to produce process water and purchases additional potable and reclaimed water to supplement the water drawn from the wells. As discussed in Section 4.4.2.1.2, the incremental increase in water demand of 191,275 gpd (approximately 69.8 million gallons per year) from the proposed project is expected to be produced by the privately-owned wells (i.e., from the available 1.2 billion gallons per year of adjudicated water rights). The existing water supply can meet the water demand of the proposed project. Under Alternative 1 the increased water demand of 110,1160 gpd would be eliminated and would be unchanged from baseline conditions. Therefore, water demand impacts from Alternative 1 would be less than significant and less than water demand impacts from the proposed project.

The proposed project was expected to reduce the overall amount of wastewater generated during operations at the Refinery by about 79,344 gpd, largely due to the shutdown of the Wilmington Operations FCCU. Under Alternative 1, the Wilmington Operations FCCU will continue to operate so there would be no decrease in wastewater generation. Wastewater generation would be unchanged and, therefore, less than significant under Alternative 1, but greater than wastewater generation impacts from the proposed project.

Noise: Alternative 1 would eliminate the increase in noise during the construction phase of the proposed project. Under the proposed project, construction noise levels were estimated based on the types of equipment proposed to be used on-site to complete the various construction activities. Using the SoundPLAN model, the noise levels at the closest residential noise receptors are expected to increase from 0.1 to 0.9 dBA depending on the location and the time of day. Therefore, noise impacts from the proposed project were considered less than significant during the construction phase of the proposed project as no noticeable noise increase is expected. Implementation of the Alternative 1 would eliminate all construction activities, thus, potential noise increases during construction would also be eliminated, remain at current levels, would be less than significant, and less than noise impacts from the proposed project.

Alternative 1 would eliminate the increase in vibration impacts during the construction phase of the proposed project. Under the proposed project, construction of the proposed project would involve equipment and activities that may have the potential to temporarily generate groundborne vibration. Based on the activities and equipment which would be used during the proposed project construction phases, the construction equipment source levels are estimated to range between 58 VdB and 100 VdB at a distance of 25 feet. The vibration from construction activities was concluded to be less than the applicable vibration significance threshold so no significant adverse vibration impacts from the proposed project are expected during the construction period. Implementing Alternative 1 would eliminate all construction activities and eliminate the potential vibration impacts during construction; therefore, groundborne vibration would be less than significant and less than groundborne vibration impacts from the proposed project.

Alternative 1 would eliminate the increase in noise during the operational phase of the proposed project. Additional noise sources associated with the proposed project generally include process equipment components such as valves, flanges, vents, pumps, and compressors. The SoundPLAN model projected that the noise levels at three of the four noise receptor locations would be unchanged and at one location the noise level was projected to increase slightly (0.1 dBA). Based on SoundPLAN model results, increased noise levels associated with the proposed project were considered less than significant during the operational phase. Implementation of Alternative 1 would eliminate the potential noise increase at noise receptor 2, noise impacts would remain at current levels, would be less than significant, and less than operational noise impacts from the proposed project.

Alternative 1 would eliminate the increase in groundborne vibration during the operational phase of the proposed project. Equipment associated with the operation of the proposed project is not expected to generate detectable groundborne vibration during normal operation because new or modified equipment is not expected to have oscillating parts that have the potential to generate groundborne vibration. Therefore, vibration from operation of the proposed project is expected to be less than significant. Since Alternative 1 does not include installing new, or modifying existing equipment, no groundborne vibration impacts would occur, so vibration impacts would be less than significant and less than operational vibration impacts from the proposed project.

Solid/Hazardous Waste: Alternative 1 would eliminate the potential solid waste generation impacts during the construction phase of the proposed project. Construction activities associated with the proposed project involve some grading and excavating activities that could generate solid waste. Demolition activities could generate demolition waste. Solid waste from constructing the proposed project were concluded to be less than significant because steel from demolition of tanks and piping is a commodity and would be recycled, while concrete foundations would be transported off-site for crushing and recycling or disposal at inert or municipal landfills. The proposed project impacts on the generation of solid wastes during construction were considered to be less than significant. Alternative 1 would eliminate the generation of solid wastes during construction since the proposed project would not be built and no demolition activities would occur. Therefore, solid waste impacts under Alternative 1 from construction activities would be less than significant and less than solid waste impacts under the proposed project.

Alternative 1 would eliminate the potential increase in hazardous waste impacts during the construction phase of the proposed project. Site preparation, grading, and construction activities for the proposed project have the potential to encounter contaminated soils, which would require treatment or removal and disposal. The amount of contaminated soil that may be encountered during construction of the proposed project was concluded to be well below the disposal capacity of the available hazardous waste landfills. As a result, no significant adverse hazardous waste impacts will occur from the proposed project and, therefore, this impact was concluded to be less than significant. Since implementing Alternative 1 means construction of the proposed project would not occur, contaminated soil or groundwater would not be encountered; instead any contaminated soil on-site would remain in place. Any groundwater contamination would continue to be subject to existing groundwater remediation activities required by the RWQCB. Since no contaminated soil would be uncovered under Alternative 1, hazardous waste impacts during construction would be less than significant and less than hazardous waste impacts from the proposed project.

Alternative 1 would eliminate the potential increase in solid waste impacts during the operational phase of the proposed project. Once the proposed project becomes operational, the average annual amounts of solid waste are not expected to change from baseline conditions because there would be no increase in employees and refinery units do not typically produce solid waste. Because the proposed project would not be implemented under Alternative 1 no change in solid waste generation from baseline levels would occur. Therefore, solid waste impacts during operation from Alternative 1 would be less than significant and equivalent to the proposed project.

Once the propose project becomes operational, it has the potential to generate hazardous wastes such as spent catalysts, both sulfuric acid and caustic, and storage tank sludge, which would be reused on-site or recycled. As a result, the proposed project impacts on the generation of hazardous wastes during operation were considered to be less than significant. Alternative 1 would eliminate the generation of hazardous wastes during operation, since the proposed project would not be built, so sulfuric acid would continue to be sent to the ECO Services Dominguez Carson for recycling via pipeline from the Carson Operations and via truck from the Wilmington Operations. Therefore, hazardous waste impacts under Alternative 1 would be less than significant and less than hazardous waste impacts from the proposed project.

Traffic/Transportation: Construction traffic conditions under the proposed project were analyzed for the construction phase having the maximum number of construction trips (peak construction period) over the entire construction period. The analysis indicated that construction worker traffic associated with the proposed project would be less than significant at all affected intersections except one, the Wilmington Ave./Interstate 405 Southbound Ramps during the morning peak hour. The construction traffic impacts associated with the proposed project are considered to be less than significant, after mitigation. Alternative 1 would eliminate the traffic impacts during construction since the proposed project would not be built. As a result, no construction traffic impacts would occur under Alternative 1, therefore, this impact would be less than significant and less than construction traffic impacts from the proposed project.

6.4.2 ALTERNATIVE 2 – NEW FFHDS FRACTIONATOR AT CARSON OPERATIONS AND A NEW DIESEL HYDROTREATER AT WILMINGTON OPERATIONS

Air Quality: Construction emissions associated with the proposed project were considered significant for VOC and NOx, as well as the LST for NO_2 emissions (see Table 4.2-2). Under Alternative 2, the modifications to the Wilmington Operations HCU and HTU-4, as well as the modifications to the No. 51 Vacuum Unit and HCU at the Carson Operations would not occur. Instead, a new FFHDS Fractionator and new Diesel Hydrotreater would be constructed. Construction activities under Alternative 2 are expected to be similar to the proposed project as one Refinery unit would be modified (FFHDS) and one new Diesel Hydrotreater would be constructed. Under the proposed project, the capacity of the Wilmington Operations HCU and HTU-4, and the Carson Operations No. 51 Vacuum Unit and HCU would be increased by up to 15 percent. The construction activities to modify the existing equipment are expected to be equivalent to the modifications to the FFHDS and Diesel Hydrotreater that include a substantial amount of associated new equipment. For example, modifications to the FFHDS are expected to include a new 200 mmBtu/hr heater, fractionator, jet stripper overhead receiver, 14 pumps, 14 heat exchangers, jet coalescer, jet salt dryer as well as piping and instrumentation. A new Diesel Hydrotreater would require two new heaters, feed drum reactor, fractionator tower, three product strippers, compressor, six pumps, six heat exchangers, and piping and instrumentation. The modifications to the two HCU units, HTU4, and No. 51 Vacuum would require modifications to existing equipment, no construction of brand new units, and no new heaters would be required. Therefore, air quality impacts associated with construction activities under Alternative 2 are concluded to be significant because construction emissions would exceed the mass daily significance thresholds for VOC, and NOx and the LSTs for NO_2 emissions. As a result, the same mitigation measures identified for the proposed project would be required under Alternative 2. In spite of implementing these mitigation measures, construction air quality impacts would remain significant. Therefore, construction air quality impacts from Alternative 2 are significant and equivalent to construction sir quality impacts from the proposed project.

Under Alternative 2, because no modifications would be made to the Wilmington Operations HCU and HTU-4, and the No. 51 Vacuum Unit and HCU at the Carson Operations, emissions from these pieces of equipment would be unchanged so they would not contribute to the operational emission increases. However, the remainder of the proposed project components would be built and operational and the Wilmington Operations FCCU would be shutdown. The indirect project emissions and mobile source emission increases would also be expected to occur (see Table 4.2-4). In addition, Alternative 2 would include the operation of a new FFHDS Fractionator and new Diesel Hydrotreater, both of which would include new heaters and new fugitive components (valves, pumps and flanges).

The operational emissions from the proposed project were considered to be less than significant, primarily due to the shutdown of the Wilmington Operations FCCU. Under Alternative 2, there are expected to be emission increases associated with the new FFHDS Fractionator and Diesel Hydrotreater and the three new heaters that would be required for their operations (e.g., a 200 mm Btu/hr heater in the FFHDS Fractionator and two 39 mmBtu/hr heaters in the Diesel Hydrotreater for a total increase in heat duty of 278 mmBtu/hr), so that operational emissions are expected to be higher than operational emissions from the proposed project (the increase in total heat duty associated with the existing heaters at the Wilmington Operations HCU would be 25 mm Btu/hr and the No. 51 Vacuum Unit would be 60 mmBtu/hr for a total of 85 mmBtu/hr; there are no increased combustion emissions associated with the HTU-4 or the Carson Operations HCU). The total combustion emissions under Alternative 2 would be greater than the proposed project (278 mmBtu/hr vs 85 mmBtu/hr). In addition, the new units would require pumps, feed drum, reactors, fractionators, towers, strippers and compressors so that the fugitive components are expected to be greater than the modifications to existing units. Therefore, fugitive VOC emissions are also expected to be higher under Alternative 2 than for the proposed project. However, the Wilmington Operations FCCU would still be shut down under Alternative 2 and all stationary source emission increases would be required to comply with SCAQMD regulations. Therefore, while operational emissions under Alternative 2 are expected to be higher than emissions from the proposed project, overall operational Refinery emissions would be reduced, so operational emission impacts are expected to be less than significant, but greater than operational emission impacts from the proposed project.

The cancer health risks from the proposed project were calculated to be less than the cancer risk significance threshold of ten in one million (ranging from 2.1 in one million at Bethune Mary School to 9.3~~2~~ in one million at the maximum exposed individual worker). Similarly, non-cancer health risks from the proposed project were calculated to be substantially less than the acute and chronic hazard index significance thresholds of 1.0 (0.052 for the maximum acute hazard index, 0.106~~127~~ for the maximum chronic hazard index, and 0.108 for the maximum 8-hr chronic hazard index). Therefore, cancer and non-cancer health risks from the proposed project are considered to be less than significant (see Table 4.2-13). Under Alternative 2, TAC emissions increases associated with modifications to the Wilmington Operations HCU and HTU-4, and the No. 51 Vacuum Unit and HCU at the Carson Operations would be eliminated. It is expected that TAC emissions increases from the FFHDS Fractionator and Diesel Hydrotreater would be incrementally higher than emission increases from other new equipment to be installed at the Refinery because of increased combustion emissions. Like the equipment that would no longer be modified under Alternative 2, the FFHDS Fractionator and Diesel Hydrotreater would also be subject to SCAQMD BACT and BACT for toxics requirements. Although TAC emissions from the Wilmington Operations HCU and HTU-4 and the No. 51 Vacuum Unit and HCU at the Carson Operations would be eliminated, it is assumed that TAC emission increases associated with the new FFHDS Fractionator and Diesel Hydrotreater under Alternative 2 would be incrementally higher than TAC emissions from the proposed project, but not substantially so. The contribution to the MEIW for the proposed project is primarily driven by the increase in rail activity with process changes (i.e., fired heater changes) contributing less than one percent to the cancer risk. The contribution to the MEIR for the proposed project is primarily driven by the new crude storage tanks at the Carson Operations. Therefore, TAC emission increases and the resulting cancer and non-cancer health risks under Alternative 2 are also expected to be less than significant, but slightly greater than the proposed project.

Hazards: The construction phase of the proposed project will require construction workers to excavate soil across the Wilmington Operations, the southeastern portion of the Carson Operations, and the Carson Crude Terminal, where construction of the new crude storage tanks will occur. Therefore, under the proposed project construction workers could encounter contaminated soils and groundwater during site excavation. Soil monitoring showed that the potential to generate hydrocarbon emissions from soil excavation limited to the area along the pipeline route in the central portion of the Wilmington Operations could exceed 50 ppm, which exceeds the SCAQMD Rule 1166 50 ppm limit that requires special handling procedures. However, because on-site workers safety training and equipment procedures would be in effect and the Refinery would be required to comply with numerous worker safety regulations, it was concluded that significant adverse health impacts to construction workers would not occur if contaminated soil or groundwater is encountered. Because construction activities and the locations of new equipment under Alternative 2 would be similar to those for the proposed project, it is assumed that construction worker health impacts from encountering contaminated soil or groundwater would be equivalent to the proposed project and also less than significant.

The hazard impacts associated with the proposed project are considered to be significant. Under the proposed project, hazards impacts associated with the Naphtha Isomerization Unit, new crude tanks, Interconnecting Pipelines, and SARP were considered to be significant as the hazard impacts could extend off-site. Under the proposed project, hazard impacts associated with modifications to the Wilmington Operations HCU and HTU-4 and the No. 51 Vacuum Unit and HCU at the Carson Operations would be slightly less or equivalent to hazards from the unmodified equipment and, therefore, were concluded to be less than significant. Since this equipment would no longer be modified under Alternative 2, associated risks would be unchanged from baseline conditions. The Naphtha Isomerization Unit, new crude tanks, Interconnecting Pipelines, and SARP would continue to be built under Alternative 2, thus, generating the same significant hazard impacts as would occur under the proposed project. However, Alternative 2 would include a new FFHDS Fractionator and Diesel Hydrotreater, which would add two new sources of potential hazard impacts, which may or may not generate additional significant adverse off-site hazards depending on the location of the new units. Note that sufficient design details are not available to determine the magnitude of hazards, but the conservative assumption is that hazard impacts would occur off-site. As a result the same hazard mitigation measure identified for the proposed project would be required under Alternative 2. In spite of implementing this mitigation measure hazard impacts would remain significant. Because two new units with new sources of potential off-site hazard impacts would be constructed under Alternative 2, hazard impacts during operation are considered to be greater than the proposed project as Alternative 2 would still include the Naphtha Isomerization Unit, new crude tanks, Interconnecting Pipelines, and SARP which were considered to be significant as the hazard impacts could extend off-site. Therefore, hazard impacts during operation under Alternative 2 would be significant and greater than the proposed project.

The proposed project would require increased transportation of fresh and spent caustic and LPG, which was determined to be less than significant. Spent sulfuric acid from the Wilmington Alkylation Unit is currently transported via six trucks per day to ECO Services Dominguez Carson for recycling, a distance of approximately 5.55 miles. Following completion of the SARP, spent sulfuric acid from Wilmington Operations would be treated on-site and reused so that the transportation of spent sulfuric acid from Wilmington Operations would be eliminated, thus, reducing the sulfuric acid transport by over 6,000 truck miles per year. Under Alternative 2, the SARP would still be constructed and the transportation of hazardous materials is expected to be similar to the proposed project. Therefore, under Alternative 2, transportation hazard impacts during operation are expected to be less than significant and equivalent to the proposed project.

Hydrology/Water Quality: Under Alternative 2, the modifications to the Wilmington Operations HCU and HTU-4, as well as the modifications to the No. 51 Vacuum Unit and HCU at the Carson Operations would not occur. Instead, a new FFHDS Fractionator and new Diesel Hydrotreater would be constructed. The total daily potable water demand during construction of the proposed project is expected to be a maximum of 40,000 gpd (10,000 gpd associated with dust suppression activities at the Wilmington Operations and up to 30,000 gpd for hydrostatic testing of the new tanks and pipelines), which is less than the significance threshold of 262,820 gpd. The locations of construction and types of activities under Alternative 2 are expected to be similar to the proposed project. Therefore, water demand during construction activities under Alternative 2 are expected to be similar to the proposed project as water demand for dust suppression and for the pipelines and storage tanks that require hydrostatic testing are also included under Alternative 2. Water demand associated with the proposed project construction activities was determined to be less than significant and water demand impacts associated with construction under Alternative 2 are also expected to be less than significant and equivalent to the proposed project.

Under the proposed project, water used for the hydrostatic testing new tanks and associated pipelines would be Refinery wastewater that is diverted for testing prior to discharge to the industrial sewer system. Demand for water to perform hydrostatic testing of new tanks and pipelines at both the Carson and Wilmington Operations can be supplied entirely using current wastewater streams at each operation. Using diverted wastewater will eliminate the need for using additional potable water supplies and will not increase the amount of wastewater generated by the Refinery, but will temporarily vary the discharge rate during construction. Wastewater associated with construction of the proposed project is expected to be discharged in compliance with existing IWDPs. Wastewater impacts from the proposed project during construction activities were determined to be less than significant. Wastewater generation during construction under Alternative 2 is expected to generate the same wastewater impacts as the proposed project, which would primarily be wastewater associated with hydrostatic testing of the new pipelines and tanks. Wastewater impacts during construction activities are expected to be less than significant under Alternative 2 as well, and equivalent to wastewater impacts for the proposed project.

Operation of the proposed project is expected to result in an increase in water demand of about 191,275 gpd associated with modifications to the NHDS, No. 51 Vacuum, Alkylation, and Wet Jet Treater Units, as well as indirect water demand increases associated with cooling water, which was determined to be less than significant. Alternative 2 would eliminate the modifications to the No. 51 Vacuum Unit and HCU, but would result in an increase in water demand associated with the new FFHDS Fractionator and Diesel Hydrotreater. The proposed project also includes shutting down the FCCU at the Wilmington Operations, which would reduce existing wash water demand by an estimated 99 gpm (about 142,560 gpd) and cooling water by an estimated 415.50 gpm (about 598,320 gpd). Therefore, the proposed project will increase the net direct potable water demand at the Refinery by about 76.5 gpm or about 110,160 gpd, which is less than the applicable potable water demand significance threshold of 262,820 gpd. Further, as discussed in Sections 3.4.1 and 4.4.2.1.2, the Refinery owns and operates private water wells to produce process water and purchases additional potable and reclaimed water to supplement the water drawn from the wells. As discussed in Section 4.4.2.1.2, the incremental increase in water demand of 191,275 gpd (approximately 69.8 million gallons per year) from the proposed project is expected to be produced by the privately-owned wells (i.e., from the available 1.2 billion gallons per year of adjudicated water rights). The existing water supply can meet the water demand of the proposed project. The water demand associated with Alternative 2 is expected to be similar to the proposed project and the daily water demand associated with the Alternative 2 would also be met from privately-owned wells. Therefore, Alternative 2 water demand impacts are expected to be less than significant and equivalent to the proposed project.

The proposed project was expected to reduce the overall wastewater generated during operations at the Refinery by about 79,344 gpd, largely due to the shutdown of the Wilmington Operations FCCU. Under Alternative 2, the Wilmington Operations FCCU would also be shutdown, reducing wastewater generation from the Refinery. Alternative 2 would be expected to result in additional wastewater generated from the Diesel Hydrotreater. However, a net reduction in wastewater generation is still expected under Alternative 2 as the Wilmington Operations FCCU would be shutdown under this alternative. Therefore, wastewater impacts are expected to remain less than significant for Alternative 2, but greater than wastewater impacts from the proposed project.

Noise: The proposed project is expected to increase the noise levels at the Refinery during construction due to the types and numbers of construction equipment to be used on-site. Using the SoundPLAN model, the noise levels at the closest residential noise receptors are expected to increase from 0.1 to 0.9 dBA depending on the location and the time of day. The increased noise levels associated with the proposed project were considered less than significant during the construction phase of the proposed project as noise levels at off-site residential noise receptors were concluded to be less than the applicable noise significance thresholds. Implementation of Alternative 2 would eliminate construction activities associated with modifications to the Wilmington Operations HCU and HTU-4 and No. 51 Vacuum Unit and HCU at the Carson Operations. However, Alternative 2 would require new construction activities associated with the FFHDS Fractionator and the Diesel Hydrotreater. It is expected that similar types and numbers of construction equipment during peak construction activities would be used to modify the Wilmington Operations HCU and HTU-4 and No. 51 Vacuum Unit and HCU at the Carson Operations under the proposed project, as would be used to construct the new FFHDS Fractionator and the Diesel Hydrotreater under Alternative 2. Also, the distances to the sensitive noise receptors is expected to be similar under Alternative 2 as the proposed project and would result in similar construction noise impacts as the proposed project. Therefore, construction noise impacts under Alternative 2 are also expected to be less than significant and equivalent to the proposed project.

Under the proposed project, construction would involve equipment and activities that may have the potential to temporarily generate groundborne vibration. Based on the activities and equipment which would be used during the proposed project construction phases, the construction equipment source levels are estimated to range between 58 VdB and 100 VdB at a distance of 25 feet. The vibration from construction activities was concluded to be less than the applicable vibration significance threshold. As indicated above, construction equipment and activities under the proposed project during peak construction activities are expected to be similar to those under Alternative 2. Therefore, construction vibration impacts under Alternative 2 are also expected to be less than significant and equivalent to the proposed project.

Additional noise sources associated with the proposed project generally include process equipment components such as valves, flanges, vents, pumps, and compressors. The SoundPLAN model projected that the noise levels at three of the four noise receptor locations would be unchanged and at one location the noise level was projected to increase slightly. Based on SoundPLAN model results, increased noise levels associated with the proposed project were considered less than significant during the operational phase. Alternative 2 would eliminate the modifications to the Wilmington Operations HCU and HTU-4 and No. 51 Vacuum Unit and HCU at the Carson Operations, but would add equipment associated with the FFHDS Fractionator and Diesel Hydrotreater. The noise impacts associated with the operation of the proposed project were not expected to change ambient noise levels at three noise receptors, but were estimated to increase by about 0.1 dBA at one noise receptor which is well below the 3.0 dBA significance threshold (see Table 4.5-3). Because noise generated by the FFHDS Fractionator and Diesel Hydrotreater is expected to be similar to noise generated by other new units, noise impacts associated with the Refinery operations under Alternative 2 are expected to be similar to the noise impacts generated by the proposed project. Therefore, operational noise impacts under Alternative 2 are also expected to be less than significant and equivalent to noise impacts generated by the proposed project.

Equipment associated with the operation of the proposed project is not expected to generate detectable groundborne vibration during normal operation because new equipment is not expected to have oscillating parts which have the potential to generate groundborne vibration. Therefore, vibration impacts from operation of the proposed project are expected to be less than significant and no significant vibration impacts are expected during operation. Similarly, the new FFHDS Fractionator and Diesel Hydrotreater installed under Alternative 2 are not expected to have oscillating parts, so no significant adverse vibration impacts are expected during operation. Therefore, groundborne impacts during operation of Alternative 2 would be less than significant and equivalent to groundborne impacts during operation of the proposed project.

Solid/Hazardous Waste: Construction activities associated with the proposed project involve grading and excavation activities that could generate solid waste. Demolition activities could generate demolition waste. Solid waste from constructing the proposed project were concluded to be less than significant because steel from demolition of tanks and piping is a commodity and would be recycled, while concrete foundations would be transported off-site for crushing and recycling or disposal at inert or municipal landfills that have the capacity to accept the material. The proposed project impacts on the generation of solid wastes were considered to be less than significant during construction. The magnitude of construction activities under Alternative 2 is expected to be the same as the proposed project because the same equipment would be demolished and the same foundations would be removed and crushed for recycling or disposal. Therefore, solid waste impacts during construction would be less than significant under Alternative 2 and equivalent to solid waste impacts from the proposed project.

Site preparation, grading, and construction activities for the proposed project have the potential to encounter contaminated soils or groundwater, which would require treatment or removal and disposal. The amount of contaminated soil that may be encountered during construction of the proposed project was concluded to be well below the daily disposal capacity of the available hazardous waste landfills, so no significant adverse hazardous waste impacts from construction will occur from the proposed project. Therefore, hazardous waste impacts from construction activities were concluded to be less than significant. Because construction equipment and activities under the proposed project are expected to be similar to those under Alternative 2, it is expected that the same amounts of contaminated soil would be encountered during construction. As for the proposed project, because the volumes of hazardous soils encountered during construction of Alternative 2 would be well below the disposal capacity of the available hazardous waste landfills, no significant adverse hazardous waste impacts from construction will occur. Therefore, hazardous waste impacts under Alternative 2 are also expected to be less than significant and equivalent to the proposed project.

Once the proposed project becomes operational, the average annual amounts of solid waste are not expected to change as there would be no increase in workers at the Refinery and refinery units do not tend to generate solid waste. For these reasons, sources and amounts of solid waste generated by Alternative 2 are expected to be less than significant and equivalent to the proposed project.

The proposed project components that would generate hazardous waste would still be included in the project under Alternative 2. The proposed project is expected to increase the amount of spent sulfuric acid (used as a catalyst), primarily from the Carson Operations Alkylation Unit. Following completion of the SARP, eight trucks per day would transport spent sulfuric acid from the Carson Operations to the SARP at the Wilmington Operations. All of the spent sulfuric acid from Wilmington Operations would then be treated on-site and reused, so spent sulfuric acid will not create an additional hazardous waste stream from the Refinery requiring disposal. Because Alternative 2 includes the same equipment, no significant adverse hazardous waste impacts from spent sulfuric acid would be generated, the same as would be the case under the proposed project.

Under the proposed project, the Wet Jet Treater and SARP are expected to use caustic and generate spent caustic. As with the current procedures at the Refinery, additional amounts of spent caustic would be generated and all spent caustic generated would be transported for recycling off-site. Under Alternative 2, all spent caustic would also be transported off-site for recycling, so no spent caustic would need to be disposed of in a hazardous waste landfill. The new storage tanks could require sludge removal approximately once every 20 years. The daily volume of waste generated during the periodic cleaning of the new storage tanks is expected to be about the same as current operations because no change in the method for tank cleaning is proposed and no more than one storage tank would be cleaned at any time. The sludge is expected to remain on-site and will be used as feedstock to the DCU (i.e., recycled on-site); therefore, no increase in hazardous waste disposal would be expected from operation of the new and modified storage tanks. Because hazardous waste streams under the proposed project are expected to be reused or recycled (see Section 4.6.3), impacts were concluded to be less than significant. Alternative 2 would generate additional catalysts associated with the FFHDS

Fractionator and Diesel Hydrotreater which are expected to be heavy metal-based catalyst. These catalysts are usually recycled for their heavy metal content. Therefore, Alternative 2 is not expected to require additional waste disposal capacity and will not interfere with the Tesoro Refinery's ability to comply with existing federal, state, and local regulations for solid and hazardous waste handling and disposal. Therefore, significant hazardous waste impacts are not expected from operation of Alternative 2, but are considered to be greater than hazardous waste impacts from the proposed project.

Traffic/Transportation: Construction traffic conditions under the proposed project were analyzed for the construction phase having the maximum number of construction trips (peak construction period) over the entire construction period. The analysis indicated that construction worker traffic associated with the proposed project would be less than significant at all affected intersections except one, the Wilmington Ave./Interstate 405 Southbound Ramps during the morning peak hour. Construction activities under Alternative 2 are expected to be similar to construction activities required for the proposed project. The proposed project is expected to require about 696 construction workers. Alternative 2 is expected to require about the same magnitude of construction activities and approximately the same number of construction workers as the proposed project during the peak construction period because similar types of new or modified equipment would be constructed and the peak construction period would also occur during a Refinery turnaround. The construction traffic impacts associated with the proposed project during peak construction are considered to be less than significant after mitigation. Because construction traffic impacts during peak construction under Alternative 2 are similar to construction traffic impacts from the proposed project, construction traffic impacts would be significant and require implementing the same construction traffic mitigation measure as the proposed project. Therefore, construction traffic impacts under Alternative 2 would also be expected to be less than significant after mitigation and would be equivalent to the proposed project.

6.4.3 ALTERNATIVE 3 - NEW GASOLINE HYDROTREATER AT CARSON OPERATIONS

Air Quality: Construction emissions associated with the proposed project were considered significant for VOC and NOx, as well as the LSTs for NO_2 emissions (see Table 4.2-2). Under Alternative 3, the modifications to the Wilmington Operations HTU-1 and HTU-2, as well as the modifications to the LHU, NHDS Unit, and Mid-Barrel Treater at the Carson Operations would be eliminated. Instead, a new Gasoline Hydrotreater/SHU would be constructed at the Carson Operations. Construction activities under Alternative 3 are expected to be less than the proposed project as one new refinery unit would be constructed at the Carson Operations, rather than modifying two existing units at the Wilmington Operations and three existing units at the Carson Operations. Nonetheless, the construction activities are still expected to require the same types of construction equipment as the proposed project and peak construction activities would occur during a Refinery turnaround. Therefore, air quality impacts associated with construction activities under Alternative 3 are also expected to exceed the significance thresholds for VOC NOx and the LSTs for NO_2 emissions. As a result, the same construction air quality mitigation measures identified for the proposed project would be required under Alternative 3. In spite of implementing these mitigation measures, construction air quality impacts would remain significant. These significant adverse construction air quality impacts are expected to be equivalent to construction air quality impacts from the proposed project and would remain significant.

Under Alternative 3, there would be no modifications to the Wilmington Operations HTU-1 and HTU-2, nor would there be modifications to the LHU, NHDS Unit, and Mid-Barrel Treater at the Carson Operations. As a result, operational emissions associated with these units would not increase, as would be the case with the proposed project, but would be unchanged from baseline conditions, so they would not contribute to operational emission increases. However, the remainder of the proposed project components would be built and operational and the Wilmington Operations FCCU would be shutdown. The indirect project emissions and mobile source emission increases would also be expected to occur (see Table 4.2-4). In addition, Alternative 3 would include the operation of a new Gasoline Hydrotreater which would include a heater, reboilers, feed drum, SHU reactor, an HDS reactor, stripper, product separator, compressor, pumps, air coolers, and associated piping and instrumentation.

The operational emissions from the proposed project were considered to be less than significant, primarily due to the shutdown of the Wilmington Operations FCCU. Under Alternative 3, there are expected to be emission increases associated with the new Gasoline Hydrotreater/SHU as two new heaters would be required (combined heater duty of 120 mmBtu/hr), that were not included with the proposed project. Therefore, overall operational emissions under Alternative 3 are expected to be greater than the proposed project, including criteria pollutants, GHG, and TAC emissions. The Wilmington Operations FCCU would still be shut down under Alternative 3 and all stationary source emission increases would be required to be offset per SCAQMD regulations. Therefore, overall operational emission increases under Alternative 3 are expected to be higher than emissions from the proposed project, but operational Refinery emissions would be reduced from baseline conditions, so operational emission impacts are expected to be less than significant, but greater than operational emission impacts from the proposed project.

The cancer health risks from the proposed project were calculated to be less than the cancer risk significance threshold of ten in one million (ranging from 2.1 in one million at Bethune Mary School to 9.3~~2~~ in one million at the maximum exposed individual worker). Similarly, non-cancer health risks from the proposed project were calculated to be substantially less than the acute and chronic hazard index significance thresholds of 1.0 (0.052 for the maximum acute hazard index, 0.106~~127~~ for the maximum chronic hazard index, and 0.108 for the maximum 8-hr chronic hazard index). Therefore, cancer and non-cancer health risks from the proposed project are considered to be less than significant (see Table 4.2-13). Under Alternative 3, TAC emission increases associated with modifications to the Wilmington Operations HTU-1 and HTU-2 and the LHU, NHDS Unit, and Mid-Barrel Treater at the Carson Operations would be eliminated and remain unchanged from baseline levels. It is expected that TAC emission increases from the Gasoline Hydrotreater/SHU would be greater due to the new heaters so that overall TAC emissions would be higher under Alternative 3 than the proposed project. As would be required for the proposed project, TAC emissions from equipment under Alternative 3 would be limited because they would also be subject to SCAQMD BACT and BACT for toxics requirements. Although TAC emissions from the Wilmington Operations HTU-1 and HTU-2 and the LHU, NHDS Unit, and Mid-Barrel Treater at the Carson Operations would be eliminated, it is assumed that TAC emission increases associated with the new Gasoline Hydrotreater/SHU would result in TAC emission increases that would be greater than the proposed project due to combustion emissions from the new heater. The contribution to the MEIW for the proposed project is primarily driven by the increase in rail activity with process changes (i.e., fired heater changes) contributing less than one percent to the cancer risk. The contribution to the MEIR for the proposed project is primarily driven by the new crude storage tanks at the Carson Operations. Therefore, TAC emission increases and associated cancer and non-cancer health risks under Alternative 3 are expected to be greater than the proposed project but would still be less than significant as the new equipment would be subject to BACT for TACs.

Hazards: The construction phase of the proposed project will require construction workers to excavate soil across the Wilmington Operations, the southeastern portion of the Carson Operations, and the Carson Crude Terminal, where construction of the new crude storage tanks will occur. Therefore, under the proposed project construction workers could encounter contaminated soils and groundwater during site excavation. Soil monitoring showed that the potential to generate hydrocarbon emissions from soil excavation along the pipeline route in the central portion of the Wilmington Operations could exceed 50 ppm, which exceeds the SCAQMD Rule 1166 50 ppm limit that requires special handling procedures. However, because on-site worker safety equipment and training procedures would be in effect and the Refinery would be required to comply with numerous worker safety regulations, it was concluded that significant adverse health impacts to construction workers would not occur if contaminated soil or groundwater is encountered. Because construction activities and the location of the new unit under Alternative 3 would be similar to those for the proposed project, it is assumed that construction worker hazard impacts from encountering contaminated soil or groundwater would be equivalent to the proposed project and also less than significant. Therefore, hazard impacts from encountering hazardous soils or groundwater under Alternative 3 would be less than significant and equivalent to hazard impacts during construction from the proposed project.

The hazard impacts associated with the proposed project are considered to be significant for the Naphtha Isomerization Unit, new crude tanks, Interconnecting Pipelines, and SARP, as the hazard impacts could extend off-site. The Naphtha Isomerization Unit, new crude tanks, Interconnecting Pipelines, and SARP were considered to be significant because the hazard impacts could extend off-site. These significant adverse hazard impacts would continue to occur under Alternative 3. Under the proposed project, hazard impacts associated with modifications to the HTU-1 and HTU-2 at the Wilmington Operations and LHU, NHDS Unit, and the Mid-Barrel Treater at the Carson Operations would be slightly less or equivalent to hazards from the unmodified equipment and, therefore, were concluded to be less than significant. The hazard effects for the HTU-1, HTU-2, LHU, NHDS Unit, and Mid-Barrel Treater would be eliminated under Alternative 3, so hazard impacts from this equipment would be unchanged from baseline under Alternative 3. In addition, Alternative 3 would include a new Gasoline Hydrotreater/SHU, which would generate new hazard impacts that may or may not extend off-site. Note that sufficient design details are not available to determine the potential magnitude of hazards associated with the Gasoline Hydrotreat or SHU. The conservative approach would be to assume impacts would occur off-site as the operational hazards under Alternative 3 would remain significant because the Naphtha Isomerization Unit, new crude tanks, Interconnecting Pipelines, and SARP are still included as part of Alternative 3. As a result, the same hazard mitigation measure identified for the proposed project would be required under Alternative 3. In spite of implementing this mitigation measure, hazard impacts would remain significant. Therefore, hazard impacts during operation associated with Alternative 3 are expected to be significant and greater than the proposed project.

The proposed project would require increased transportation of fresh and spent caustic and LPG, which was determined to be less than significant. Spent sulfuric acid from the Wilmington Alkylation Unit is currently transported via six trucks per day to the ECO Services Dominguez Carson for recycling, a distance of approximately 5.55 miles. Following completion of the SARP, spent sulfuric acid from Wilmington Operations would be treated on-site and reused so that the transportation of spent sulfuric acid from Wilmington Operations would be eliminated, thus, reducing the sulfuric acid transport by over 6,000 truck miles per year. Under Alternative 3, the SARP would be constructed and the transportation of hazardous materials is expected to be similar to the proposed project. Therefore, under Alternative 3, transportation hazard impacts during operation are expected to be less than significant and equivalent to transportation hazard impacts from the proposed project.

Hydrology/Water Quality: Under Alternative 3, Wilmington Operations HTU-1 and HTU-2, as well as the modifications to the LHU, NHDS Unit, and Mid-Barrel Treater at the Carson Operations would not be constructed. Instead, a new Gasoline Hydrotreater/SHU would be installed. Construction activities under Alternative 3 are expected to be similar to the proposed project as one new refinery unit would be constructed under Alternative 3, instead of the proposed modifications identified above. The total daily potable water demand during construction of the proposed project is expected to be a maximum of 40,000 gpd (10,000 gpd associated with dust suppression activities at the Wilmington Operations and up to 30,000 gpd for hydrostatic testing of new tanks and pipelines), which is less than the significance threshold of 262,820 gpd. Water demand during construction activities under Alternative 3 are expected to be similar to the proposed project as the pipelines and storage tanks that require hydrostatic testing are also included under Alternative 3. Water demand associated with the proposed project construction activities was determined to be less than significant. Water demand impacts associated with construction under Alternative 3 are also expected to be less than significant and equivalent to the proposed project.

Under the proposed project, water used for the hydrostatic testing new tanks and associated pipelines would be Refinery wastewater that is diverted for testing prior to discharge to the industrial sewer system. Demand for water to perform hydrostatic testing of new tanks and pipelines at both the Carson and Wilmington Operations can be supplied entirely using current wastewater streams at each operation. Using diverted wastewater will eliminate the need for using additional potable water supplies and will not increase the amount of wastewater generated by the Refinery, but will temporarily vary the discharge rate during construction. Wastewater associated with construction of the proposed project is expected to be discharged in compliance with existing IWDPs. Wastewater impacts from the proposed project during construction activities were determined to be less than significant. Wastewater generation during construction under Alternative 3 is expected to generate the same wastewater impacts as the proposed project, which would include wastewater associated with hydrostatic testing of the new pipelines and tanks (which are also included in Alternative 3). Wastewater impacts during construction activities are expected to be less than significant under Alternative 3 as well, and equivalent to wastewater impacts for the proposed project.

Operation of the proposed project is expected to result in an increase in water demand of about 191,275 gpd associated with modifications to the NHDS, No. 51 Vacuum, Alkylation, and Wet Jet Treater Units, as well as indirect water demand increases associated with cooling water, which was determined to be less than significant. Alternative 3 would eliminate the modifications to the NHDS, but would result in an approximately equivalent increase in water demand associated with the new Gasoline Hydrotreater/SHU. The proposed project also includes shutting down the FCCU at the Wilmington Operations, which would reduce existing wash water demand by an estimated 99 gpm (about 142,560 gpd) and cooling water by an estimated 415.50 gpm (about 598,320 gpd). Therefore, the proposed project will increase the net direct potable water demand at the Refinery by about 76.5 gpm or about 110,160 gpd, which is less than the applicable potable water demand significance threshold of 262,820 gpd. Further, as discussed in Sections 3.4.1 and 4.4.2.1.2, the Refinery owns and operates private water wells to produce process water and purchases additional potable and reclaimed water to supplement the water drawn from the wells. As discussed in Section 4.4.2.1.2, the incremental increase in water demand of 191,275 gpd (approximately 69.8 million gallons per year) from the proposed project is expected to be produced by the privately-owned wells (i.e., from the available 1.2 billion gallons per year of adjudicated water rights). The existing water supply can meet the water demand of the proposed project. The water demand associated with Alternative 3 is expected to be similar to the proposed project and the daily water demand associated with the Alternative 3 would also be met from privately-owned wells. Therefore, Alternative 3 water supply impacts are expected to be less than significant and equivalent to the proposed project.

The proposed project was expected to reduce the overall wastewater generated during operations at the Refinery by about 79,344 gpd, largely due to the shutdown of the Wilmington Operations FCCU. Under Alternative 3, the Wilmington Operations FCCU would also be shutdown, reducing wastewater generation from the Refinery. Alternative 3 would be expected to result in additional wastewater generated from the Gasoline Hydrotreater/SHU. However, a net reduction in wastewater generation is still expected under Alternative 3 as the Wilmington Operations FCCU would be shut down under this alternative. Therefore, wastewater impacts are expected to remain less than significant, but, due to wastewater generated by the Gasoline Hydrotreater/SHU, greater than wastewater impacts from the proposed project.

Noise: The proposed project is expected to increase the noise levels at the Refinery during construction due to the types and numbers of construction equipment to be used on-site. Using the SoundPLAN model, the noise levels at the closest residential noise receptors are expected to increase from 0.1 to 0.9 dBA depending on the location and the time of day. The increased noise levels associated with the proposed project were considered less than significant during the construction phase of the proposed project as noise levels at off-site residential noise receptors were concluded to be less than the applicable noise significance thresholds. Alternative 3 would eliminate construction activities associated with modifications to the Wilmington Operations HTU-1 and HTU-2, as well as the modifications to the LHU, NHDS Unit, and Mid-Barrel Treater at the Carson Operations. However, Alternative 3 would require additional construction activities associated with the Gasoline Hydrotreater/SHU. Because similar types and numbers of construction equipment would be used during peak construction activities under the proposed project (to modify the Wilmington Operations HTU-1 and HTU-4, and LHU, NHDS Unit, and Mid-Barrel Treater at the Carson Operations) as would be used to construct the new Gasoline Hydrotreater/SHU and distances to noise receptors would be similar under the two scenarios, it is expected that Alternative 3 would result in similar construction activities and noise impacts as the proposed project. Therefore, noise impacts during construction of Alternative 3 are expected to be less than significant and equivalent to construction noise impacts from the proposed project.

Under the proposed project, construction would involve equipment and activities that may have the potential to temporarily generate groundborne vibration. Based on the activities and equipment which would be used during the proposed project construction phases, the construction equipment source levels are estimated to range between 58 VdB and 100 VdB at a distance of 25 feet. The vibration from construction activities was concluded to be less than the applicable vibration significance threshold. As indicated above, construction equipment and activities under the proposed project during peak construction activities are expected to be similar to those under Alternative 3. Therefore, construction vibration impacts under Alternative 3 are also expected to be less than significant and equivalent to the proposed project.

Additional noise sources associated with the proposed project generally include process equipment components such as valves, flanges, vents, pumps, and compressors. The SoundPLAN model projected that the noise levels at three of the four noise receptor locations would be unchanged under the proposed project and at one location the noise level was projected to increase by 0.1 dBA which is well below the 3.0 dBA significance threshold (see Table 4.5-3). Based on SoundPLAN model results, increased noise levels associated with the proposed project were considered less than significant during the operational phase. Alternative 3 would eliminate the modifications to the Wilmington Operations HTU-1 and HTU-2, as well as the modifications to the LHU, NHDS Unit, and Mid-Barrel Treater at the Carson Operations so any noise from this equipment would be unchanged from baseline conditions. However, Alternative 3 includes adding equipment associated with the new Gasoline Hydrotreater/SHU. Because noise generated by the Gasoline Hydrotreater/SHU is expected to be similar to noise generated by other new and modified units, noise impacts associated with the Refinery operations under Alternative 3 are expected to be similar to the noise impacts generated by the proposed project. Therefore, operational noise impacts under Alternative 3 are also expected to be less than significant and equivalent to noise impacts generated by the proposed project.

Equipment associated with the operation of the proposed project is not expected to generate detectable groundborne vibration during normal operation because new equipment is not expected to have oscillating parts which have the potential to generate groundborne vibration. Therefore, vibration impacts from operation of the proposed project are expected to be less than significant. Similarly, the new Gasoline Hydrotreater/SHU installed under Alternative 3 is not expected to have oscillating parts, so no significant adverse vibration impacts are expected during operation. Therefore, groundborne vibration impacts during operation of Alternative 3 would be less than significant and equivalent to groundborne vibration impacts from the proposed project.

Solid/Hazardous Waste: Construction activities associated with the proposed project involve grading and excavation activities that could generate solid waste. Demolition activities could generate demolition waste. Solid waste from constructing the proposed project were concluded to be less than significant because steel from demolition of tanks and piping is a commodity and would be recycled, while concrete foundations would be transported off-site for crushing and recycling or disposal at inert or municipal landfills, which have available capacity. The proposed project impacts on the generation of solid wastes were considered to be less than significant during construction. The magnitude of construction activities under Alternative 3 is expected to be the same as the proposed project because the same equipment would be demolished and the same foundations would be removed and crushed for recycling or disposal. Therefore, solid waste impacts during construction would be less than significant under Alternative 3 and equivalent to solid waste impacts from the proposed project.

Site preparation, grading, and construction activities for the proposed project have the potential to encounter contaminated soil or groundwater, which would require treatment or removal and disposal. The amount of contaminated soil that may be encountered during construction of the proposed project was concluded to be well below the daily disposal capacity of the available hazardous waste landfills, so no significant adverse impacts would occur from the proposed project. Therefore, hazardous waste impacts during construction were concluded to be less than significant. Because the areas disturbed and construction equipment and activities under the proposed project are expected to be similar to those under Alternative 3, it is expected that the same amounts of contaminated soil would be encountered during construction. Similar to the proposed project, because the volumes of hazardous soils encountered during construction of Alternative 3 would be well below the disposal capacity of the available hazardous waste landfills, no significant adverse hazardous waste impacts during construction will occur. Therefore, hazardous waste impacts during construction under Alternative 3 are also expected to be less than significant and equivalent to the proposed project.

Once the proposed project becomes operational, the average annual amounts of solid waste are not expected to change as there would be no increase in workers at the Refinery and refinery units do not tend to generate solid waste. For these reasons, sources and amounts of solid waste generated by Alternative 3 are expected to be less than significant and equivalent to the proposed project.

The project components associated with the proposed project that would generate hazardous waste would still be included in the project under Alternative 3. The proposed project is expected to increase the amount of spent sulfuric acid (used as a catalyst), primarily from the Carson Operations Alkylation Unit. Following completion of the SARP, eight trucks per day would transport spent sulfuric acid from the Carson Operations to the SARP at the Wilmington Operations. All of the spent sulfuric acid from Wilmington Operations would then be treated on-site and reused, so increased production of spent sulfuric acid will not create an additional hazardous waste stream from the Refinery requiring disposal. Because Alternative 3 includes this same equipment, hazardous waste impacts from increased amounts of spent sulfuric acid would be less than significant and equivalent to the proposed project.

Under the proposed project, the Wet Jet Treater, and SARP are expected to use caustic and generate spent caustic. As with the current procedures at the Refinery, additional amounts of spent caustic would be generated and all spent caustic generated would be transported for recycling off-site. Under Alternative 3, all spent caustic would also be transported off-site for recycling, so no spent caustic would need to be disposed of in a hazardous waste landfill. The new storage tanks could require sludge removal approximately once every 20 years. The daily volume of waste generated during the periodic cleaning of the new storage tanks is expected to be about the same as current operations because no change in the method for tank cleaning is proposed and no more than one storage tank would be cleaned at any time. The sludge is expected to remain on-site and will be used as feedstock to the DCU (i.e., recycled on-site); therefore, no increase in waste disposal would be expected from operation of the new and modified storage tanks. Because hazardous waste streams under the proposed project are expected to be reused or recycled (see Section 4.6.3), impacts were concluded to be less than significant. Because Alternative 3 includes installing the same number and size of storage tanks as the proposed project, the same amounts of sludge would be generated at the same rate, which would remain on-site and be used as a feedstock for the DCU. Hydrotreaters typically use a heavy metal-based catalyst to reduce aromatic compounds and impurities such as sulfur from fuels. Alternative 3 would result in an increase in the use of catalyst. The volume of catalyst that would be used in the Gasoline Hydrotreater is currently unknown, but additional spent catalyst is expected to be generated. The additional spent catalyst would be recycled for the metal content so that no additional waste stream that requires disposal would be produced under Alternative 3.

In addition, Alternative 3 is not expected to require additional waste disposal capacity and will not interfere with the Tesoro Refinery's ability to comply with existing federal, state, and local regulations for solid and hazardous waste handling and disposal. Consequently, hazardous waste impacts would be less than significant, but because more spent heavy metal catalysts would be generated, hazardous waste impacts would be greater than those from the proposed project.

Traffic/Transportation: Construction traffic conditions under the proposed project were analyzed for the construction phase having the maximum number of construction trips (peak construction period) over the entire construction period. The analysis indicated that construction worker traffic associated with the proposed project would be less than significant at all affected intersections except one, the Wilmington Ave./Interstate 405 Southbound Ramps during the morning peak hour. The proposed project is expected to require about 696 construction workers. Peak construction activities under Alternative 3 are expected to be similar to construction activities required for the proposed project during peak construction activities. Alternative 3 is expected to require about the same magnitude of construction activities and approximately the same number of construction workers as the proposed project during the peak construction period because similar types of new or modified equipment would be constructed and the peak construction period would also occur during a Refinery turnaround. The construction traffic impacts associated with the proposed project during peak construction are considered to be less than significant after mitigation. Since construction traffic impacts during peak construction under Alternative 3 are the same as the proposed project and are also expected to be significant, the same mitigation measure required for the proposed project would be required for Alternative

3. Therefore, construction traffic impacts under Alternative 3 would be less than significant after mitigation and would be equivalent to the proposed project.

6.4.4 ALTERNATIVE 4 – INTERCONNECTING PIPELINE AND NEW GASOLINE HYDROTREATER AT CARSON OPERATIONS

Air Quality: Air quality impacts associated with construction of the proposed project (see Table 4.2-2) would be reduced under Alternative 4 because construction activities would be reduced and only include construction of the Interconnecting Pipelines, new Gasoline Hydrotreater and new SHU. Construction emissions associated with the proposed project were considered significant for VOC and NOx, as well as the LSTs for NO_2 emissions. In spite of implementing mitigation measures, construction air quality impacts would remain significant. Under Alternative 4, approximately 192 construction workers are expected to be needed to construct the pipeline, compared to 696 construction workers associated with the proposed project. An additional 250 construction workers are estimated to be required to construct the new Gasoline Hydrotreater and SHU. Therefore, there would be an approximately 45 percent reduction in the number of construction workers needed during peak construction under Alternative 4 compared to the proposed project during peak construction activities. The level of construction activities (including construction equipment) is also expected to be reduced by about 45 percent (see Table 6.4-3). Therefore, air quality impacts from construction under Alternative 4 would be less than significant for VOC, CO, SOx, PM10 and PM2.5. The LSTs for NO_2 emissions during construction activities under Alternative 4 are also expected to be less than significant. Daily construction emissions for NOx under Alternative 4 would remain significant, but would be less than daily construction NOx emissions under the proposed project. As a result, all mitigation measures identified for the proposed project would be required for Alternative 4. Therefore, with the exception of NOx emissions, which would continue to be significant, construction air quality impacts under Alternative 4 would be less than significant and less than construction air quality impacts under the proposed project.

The operational emissions effects associated with the proposed project's new and modified units would be eliminated under Alternative 4, as none of the proposed unit modifications or new units would be installed and operated. Under Alternative 4, there would be no emission increases associated with DCU Heater H-100, HCU Heaters H-300/301, the SARP, PSTU, new storage tanks, or fugitive emissions increases at the Wilmington Operations (CRU-3, HCU, HTU-1, HTU-2, or HTU-4) or Carson Operations (No. 51 Vacuum Unit, Alkylation Unit, HCU, LHU, LPG Railcar Unloading facilities, Mid Barrel Distillate Treater, Naphtha Isomerization Unit, NHDS Unit, and Wet Jet Treater).

TABLE 6.4-3

Comparison of Proposed Project and Alternative 4
Peak Construction Emissions
(lb/day)

ACTIVITY	VOC	CO	NOx	SOx	PM10	PM2.5
Proposed Project Construction Emissions						
Proposed Project Construction Emissions[(a)]	106.65	515.54	575.73	1.41	68.55	38.67
SCAQMD Threshold Level	75	550	100	150	150	55
Significant?	**Yes**	**No**	**Yes**	**No**	**No**	**No**
Alternative 4 Estimated Construction Emissions						
Alternative 4 Construction Emissions[(b)]	69.32	335.10	374.23	0.92	44.56	25.14
SCAQMD Threshold Level	75	550	100	150	150	55
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**

(a) See Table 4.2-2 for detailed construction emissions estimates.
(b) Assumes construction activities are 65 percent of the construction activities for the proposed project.

The operational emissions from the proposed project were considered to be less than significant, primarily due to the shutdown of the Wilmington Operations FCCU. Under Alternative 4, there are expected to be emission increases associated with the new Gasoline Hydrotreater/SHU as two new heaters would be required (with a combined heat duty of 120 mm Btu/hr). The total combined heat duty of all new heaters and heater modifications associated with the proposed project is an increase of approximately 202 mmBtu/hr, so that operational GHG and criteria pollutant emissions increases under Alternative 4 are expected to be less than the proposed project. Under Alternative 4, the Wilmington Operations FCCU would not be shut down because none of the Refinery modifications needed for that to occur would be made. Crude tank modifications at the Carson and Wilmington Operations would not occur and the crude unloading rate from the marine terminal would remain unchanged at 5,000 bbl/hr. Therefore, the beneficial local emission reduction effects of the proposed project associated with reduced annual ship emissions due to the increased crude offloading rate (see Table 4.2-9) would also be eliminated.

Consequently, operational air quality impacts under Alternative 4 would be less than significant as all emission increases from new stationary sources would be required to be offset. Under Alternative 4 overall operational emissions from the Refinery would be less than significant, but higher than overall operational emissions from the proposed project as the emissions reduction benefits associated with the proposed project would not be achieved (see Table 6.4-4).

TABLE 6.4-4

Predicted Operational Criteria Pollutant Air Emissions Under Alternative 4

Sources	Emissions (lbs/day)					
	VOC	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5[(a)]**
Total Proposed Project Emissions[(a)]	49.09	-589.28	38.18	<0.01	1.16	0.89
Significance Threshold	55	550	55	150	150	55
Significant?	**No**	**No**	**No**	**No**	**No**	**No**
Alternative 4 Operational Emissions[(b)]	318.96	959.79	572.59	416.38	171.35	171.35
New Gasoline Hydrotreater Heaters	15	76	7	15	16	15
Alternative 4 Increase in Operational Emissions[(c)]	0	76	0	0	0	0
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Note: Negative numbers represent emission reductions.

(a) See Table 4.2-4 for further details.

(b) The Wilmington Operations FCCU would not be shut down so the daily emissions associated with the FCCU operation would remain. These results reflect baseline emissions at the Refinery and do not represent emission increases.

(c) In addition to the FCCU emissions, additional emissions would be associated with the new Gasoline Hydrotreater and SHU, but sufficient engineering information is not available to provide more than an emissions estimate from those units VOC , NOx, SOx, and PM10 are required to comply with offset requirements of Regulations XIII and XX. Therefore, no net increase in emissions would be expected.

Alternative 4 would eliminate the increased TAC emissions and the associated cancer and non-cancer health risks that were projected to occur under the proposed project. The cancer health risks from the proposed project were calculated to be less than the cancer risk significance threshold of ten in one million and, therefore, were considered to be less than significant. Similarly, non-cancer health risks from the proposed project were calculated to be substantially less than the acute and chronic hazard index significance thresholds of 1.0. The TAC emission reduction benefits associated with the shutdown of the Wilmington Operations FCCU and the reduced annual ship emissions due to the increased crude offloading rate were not included as part of the HRA analysis in the EIR; however, under Alternative 4 these TAC emission reductions would not occur. It is assumed that TAC emission increases associated with the new Gasoline Hydrotreater/SHU would be greater than the proposed project due to combustion emissions from the new heaters. However, emissions from the proposed project from rail transport would not occur. Therefore, TAC emission increases and associated cancer and non-cancer health risks under Alternative 4 are expected to be less than the proposed project and would still be less than significant.

Hazards: The construction phase of the proposed project will require construction workers to excavate soil across the Wilmington Operations, the southeastern portion of the Carson Operations, and the Carson Crude Terminal, where construction of the new crude storage tanks will occur. Therefore, under the proposed project construction workers could encounter contaminated soils and groundwater during site excavation; however, because of on-site worker safety equipment and training and the fact that the Refinery would be required to comply with numerous worker safety regulations, the impact was concluded to be less than significant.

Under Alternative 4, there is the potential for the discovery of contaminated soils during construction activities associated with constructing the Interconnecting Pipelines and the new Gasoline Hydrotreater and SHU. The proposed Interconnecting Pipelines associated with the proposed project would be underground off-site (i.e., approximately 80 feet under Alameda Street and Sepulveda Boulevard). At on-site locations, the pipeline would be located above ground and little soil excavation would be required, minimizing the potential for exposure to contaminated soils or groundwater. The air sampling results for the proposed project indicated that in areas within the Refinery where excavation is expected to be less than 20 feet, VOC concentrations are expected to be less than the SCAQMD Rule 1166 50 ppm limit that requires special soil handling procedures to be implemented, with the exception of two areas. The two areas that may have VOC concentrations greater than 50 ppm could be excavated under Alternative 4, depending on the location of the Gasoline Hydrotreater and SHU. As a result, potential hazard impacts from encountering contaminated soil could occur, but would be less than significant for the same reasons identified for the proposed project and equivalent to construction hazard impacts from the proposed project.

The hazard impacts associated with the proposed project are considered to be significant for the Naphtha Isomerization Unit, new crude tanks, Interconnecting Pipelines, and SARP, as the hazard impacts could extend off-site. Since Alternative 4 does not include these pieces of equipment, significant adverse hazard impacts associated with the Naphtha Isomerization Unit, new crude tanks, and SARP components of the proposed project would not occur as these project components would be eliminated. Alternative 4 would include the installation of a new Gasoline Hydrotreater and SHU, which could result in significant adverse hazard impacts, depending on the location of the unit. Note that sufficient design details are not available to determine the magnitude of hazards, but the conservative assumption is that hazardous impacts could occur off-site. As a result the same hazard mitigation measure identified for the proposed project would be required for Alternative 4. In spite of implementing this mitigation measure hazard impacts are expected to remain significant. Alternative 4 would not eliminate the proposed project hazard impacts associated with the Interconnecting Pipeline and those hazards would remain significant. Overall, Alternative 4 has the potential to generate significant adverse hazard impacts associated with the Interconnecting Pipeline and new equipment; however, hazard impacts would be less than potential hazard impacts from the proposed project as fewer modifications would be required.

Although the proposed project would require increased transportation of fresh and spent caustic and LPG, traffic hazard impacts were determined to be less than significant. Alternative 4 would not result in an increase in the transport of spent caustic or LPG because new or modified equipment that would generate spent caustic or require LPG would not be constructed and operated. However transportation of spent caustic that is currently occurring under the existing Refinery operations would continue to occur. Due to the construction of the SARP, the proposed project would reduce the sulfuric acid transport trips by over 6,000 truck miles per year. Under Alternative 4, the SARP would not be constructed and the truck miles traveled to transport sulfuric acid would not be reduced, but would continue to occur. Under the Alternative 4, net transportation hazards are expected to be less than significant and less than transportation hazards from the proposed project because transporting spent caustic and LPG would require substantially longer trips than occurs for sulfuric acid.

Hydrology/Water Quality: Total daily potable water demand during construction of the proposed project is expected to be a maximum of 40,000 gpd (10,000 gpd associated with dust suppression activities at the Wilmington Operations and up to 30,000 gpd for piping hydrostatic testing of new tanks and pipelines). Alternative 4 would eliminate approximately 45 percent of the construction site preparation activities, such as grading, as grading would only be required for the new Gasoline Hydrotreater and SHU, so the water demand for dust suppression would be less than 10,000 gpd required for the proposed project. Water demand associated with pipeline hydrostatic testing during the construction period would still be required. Under Alternative 4, the Interconnecting Pipelines that will be routed under the Alameda Corridor and Sepulveda Boulevard will be hydrotested using potable water, as there will be no access to the wastewater system at either the Carson or Wilmington Operation. Similar to the proposed project, it is not expected that the fill rate of piping for hydrostatic testing would exceed 500 gpm, which corresponds to 30,000 gpd, which is less than the water demand significance threshold of 262,820 gpd. Potable water demand associated with Alternative 4 during construction would also be less than significant and less than the potable water demand associated with construction of the proposed project.

Under the proposed project, water used for the hydrostatic testing new tanks and associated pipelines would be Refinery wastewater that is diverted for testing prior to discharge to the industrial sewer system. Using diverted wastewater will eliminate the need for using additional potable water supplies and will not increase the amount of wastewater generated by the Refinery, but will vary the discharge rate during construction. Proposed project impacts on wastewater generated during construction activities were determined to be less than significant. Alternative 4 would result in an increase in wastewater associated with hydrostatic testing of the new pipelines, but no wastewater would be needed for hydrostatic testing of new tanks because these would be eliminated under Alternative 4. Wastewater associated with construction is expected to be discharged in compliance with existing IWDPs. Wastewater impacts during construction are expected to be less than significant under Alternative 4 and less than wastewater impacts during construction of the proposed project.

Under Alternative 4, it is expected that the operation of the Gasoline Hydrotreater and SHU would require water. The proposed project is expected to result in a net increase in water demand of about 191,275 gpd associated with modifications to the NHDS, No. 51 Vacuum, Alkylation, and Wet Jet Treater Units, as well as indirect water demand increases associated with cooling water. The proposed project also includes shutting down the FCCU at the Wilmington Operations, which would reduce existing wash water demand by an estimated 99 gpm (about 142,560 gpd) and cooling water by an estimated 415.50 gpm (about 598,320 gpd). Therefore, the proposed project will increase the net direct potable water demand at the Refinery by about 76.5 gpm or about 110,160 gpd, which is less than the applicable potable water demand significance threshold of 262,820 gpd. Further, as discussed in Sections 3.4.1 and 4.4.2.1.2, the Refinery owns and operates private water wells to produce process water and purchases additional potable and reclaimed water to supplement the water drawn from the wells. As discussed in Section 4.4.2.1.2, the incremental increase in water demand of 191,275 gpd (approximately 69.8 million gallons per year) from the proposed project is expected to be produced by the privately-owned wells (i.e., from the available 1.2 billion gallons per year of adjudicated water rights). The existing water supply can meet the water demand of the proposed project. The impacts of the proposed project on water demand during operation were determined to be less than significant. Since Alternative 4 includes the installation of two new units as opposed to modification to a number of units, the water demand is expected to be less than the proposed project. Under Alternative 4, the FCCU would continue operating, there would be no reduction in water demand, and water demand from the FCCU would be unchanged from baseline conditions. Therefore, water demand impacts during operation of Alternative 4 would be less than significant and would also be met from privately-owned wells. However, under Alternative 4, the 740,880 gpd reduction in water use from the shutdown of the FCCU would not be realized so water demand under Alternative 4 would be greater than the proposed project.

The proposed project was expected to reduce the overall wastewater generated during operations at the Refinery by about 79,344 gpd, largely due to the shutdown of the Wilmington Operations FCCU. Under Alternative 4, the Wilmington Operations FCCU will continue to operate so there would be no decrease in wastewater generation and there would be additional wastewater generated by the Gasoline Hydrotreater/SHU. Nonetheless, wastewater generation under Alternative 4 would remain less than significant. Wastewater impacts under Alternative 4 are expected to be greater than the proposed project because the FCCU would not be shut down.

Noise: The proposed project is expected to increase the noise levels at the Refinery during construction due to the numbers and types of construction equipment. Using the SoundPLAN model, the noise levels from the proposed project at the closest residential noise receptors are expected to increase from 0.1 to 0.9 dBA depending on the location and the time of day. The increased noise levels associated with the proposed project were considered less than significant during the construction phase of the proposed project as noise levels at off-site residential noise receptors were concluded to be less than the applicable noise significance thresholds. Implementation of the Alternative 4 would reduce the potential noise impacts associated with construction activities as approximately 45 percent of the number of pieces of construction equipment would be needed to construct the Interconnecting Pipeline and Gasoline Hydrotreater/SHU. As a result, construction noise impacts from Alternative 4 would be less than significant and less than construction noise impacts from the proposed project.

Under the proposed project, construction would involve equipment and activities that may have the potential to temporarily generate groundborne vibration. Based on the activities and equipment which would be used during the proposed project construction phases, the construction equipment source levels are estimated to range between 58 VdB and 100 VdB at a distance of 25 feet. The vibration from construction activities was concluded to be less than the applicable vibration significance threshold. Because Alternative 4 would require approximately 45 percent fewer numbers and types of construction equipment, vibration impacts during construction would be less than vibration impacts from the proposed project. Consequently, construction vibration impacts from Alternative 4 would be less than significant and less than construction vibration impacts from the proposed project.

Additional noise sources associated with the operation of the proposed project generally include process equipment components such as valves, flanges, vents, pumps, and compressors. The SoundPLAN model concluded that the noise levels associated with operation of the proposed project at three of the four noise receptor locations would be unchanged and at one location the noise level was projected to increase by 0.1 dBA which is well below the 3.0 dBA significance threshold (see Table 4.5-3). Based on SoundPLAN model results, increased noise levels associated with the proposed project were considered to be less than significant during the operational phase. Under Alternative 4, less noise-generating refinery equipment would be installed and operated at the Refinery. Therefore, noise impacts during operation under Alternative 4 are expected to be less than significant and less than operational noise impacts from the proposed project.

Equipment associated with the operation of the proposed project is not expected to generate detectable groundborne vibration during normal operation because new equipment is not expected to have oscillating parts, which have the potential to generate groundborne vibration. Therefore, vibration impacts from operation of the proposed project are expected to be less than significant and no significant vibration impacts are expected during operation. Alternative 4 includes constructing and operating the Interconnecting Pipeline and Gasoline Hydrotreater/SHU and does not include any operational equipment that could generate vibration impacts. Therefore, operational vibration impacts from Alternative 4 are considered to be less than significant and less than operational vibration impacts from the proposed project.

Solid/Hazardous Waste: Construction activities associated with the proposed project involve grading and excavation activities that could generate solid waste. Demolition activities could generate demolition waste. Solid waste from constructing the proposed project were concluded to be less than significant because steel from demolition of tanks and piping is a commodity and would be recycled, while concrete foundations would be transported off-site for crushing and recycling or disposal at inert or municipal landfills, which have available capacity. The proposed project impacts on the generation of solid wastes were considered to be less than significant. Alternative 4 does not involve grading for, or demolition of tanks, foundations, or other structures. As a result, Alternative 4 is not expected to generate any solid waste impacts during construction, so solid waste impacts from construction are considered to be less than significant and less than solid waste impacts during construction of the proposed project.

Site preparation, grading, and construction activities for the proposed project have the potential to encounter contaminated soils or groundwater, which would require treatment or removal and disposal. The amount of contaminated soil that may be encountered during construction of the proposed project was concluded to be well below the daily disposal capacity of the available hazardous waste landfills and, therefore, was concluded to be less than significant. Alternative 4 would include site preparation and grading for the Gasoline Hydrotreater/SHU. Under Alternative 4, there is the potential for the discovery of contaminated soils during construction activities associated with constructing Gasoline Hydrotreater/SHU and the Interconnecting pipelines in the same volumes that would occur under the proposed project. Under Alternative 4 the area associated with construction the Interconnecting pipelines and the Gasoline Hydrotreater/SHU would be smaller than the area that would need to be graded under the proposed project, e.g., construction of the six new crude tanks would not be built under Alternative 4. If contaminated soil is encountered under Alternative 4, the volume is expected to be less than the volume encountered under the proposed project. Since Alternative 4 would generate smaller volumes of contaminated soils, local landfills and treatment facilities have sufficient capacity to handle the one-time generation of hazardous construction waste.

Therefore, hazardous waste impacts during construction of Alternative 4 would be less than significant and less than hazardous waste impacts during construction of the proposed project.

Once the proposed project becomes operational, the average annual amounts of solid waste are not expected to change as there would be no increase in workers and refinery units do not tend to generate solid waste. Sources and amounts of solid waste generated by Alternative 4 are expected to be less than significant and equivalent to the proposed project.

The proposed project is expected to increase the amount of spent sulfuric acid (used as a catalyst), primarily from the Carson Operations Alkylation Unit. Following completion of the SARP, eight trucks per day would transport spent sulfuric acid from the Carson Operations to the SARP at the Wilmington Operations. All of the spent sulfuric acid from Wilmington Operations would then be treated on-site and reused, so that spent sulfuric acid would be regenerated and recycled on-site. Alternative 4 would eliminate the construction of the SARP so that sulfuric acid would continue to be transported to ECO Services Dominguez Carson for recycling via pipeline from the Carson Operations and via truck from the Wilmington Operations. Therefore, hazardous waste impacts from spent sulfuric acid during operation would be less than significant under Alternative 4 as all spent sulfuric acid would be recycled, as it would under the proposed project.

Under the proposed project, the Wet Jet Treater, and SARP are expected to use caustic and generate spent caustic. As with the current procedures at the Refinery, the additional amounts of spent caustic will be transported for recycling off-site. Under Alternative 4, no new sources of spent caustic would be constructed and operated, so spent caustic waste impacts during operation would remain unchanged, be less than significant and less than spent caustic waste impacts during operation of the proposed project.

Under the proposed project, the new storage tanks could require sludge removal approximately once every 20 years. The daily volume of waste generated during the periodic cleaning of the new storage tanks is expected to be about the same as current operations because no change in the method for tank cleaning is proposed and no more than one storage tank would be cleaned at any time. The sludge is expected to remain on-site and will be used as feedstock to the DCU (i.e., recycled on-site); therefore, no increase in waste disposal would be expected from operation of the new and modified storage tanks. Alternative 4 does not include construction of new storage tanks, so the amount of sludge generated would remain unchanged compared to baseline conditions, so the daily hazardous sludge waste impacts during operation would remain unchanged, but would be less over longer time periods, would be less than significant and equivalent to daily hazardous sludge waste impacts during operation, but less than long-term hazardous waste impacts from the proposed project.

Traffic/Transportation: Construction traffic conditions under the proposed project were analyzed for the construction phase having the maximum number of construction trips (peak construction period) over the entire construction period. The analysis indicated that construction worker traffic associated with the proposed project would be less than significant at all affected intersections except one, the Wilmington Ave./Interstate 405 Southbound Ramps during the morning peak hour. Peak construction traffic impacts at this location were concluded to be significant, in part, because the southbound ramps are currently undergoing construction to improve traffic flow. Alternative 4 would reduce traffic associated with construction activities since only the pipeline portion of the proposed project and two new units would be constructed. The number of construction workers during peak construction activities under Alternative 4 are expected to be a maximum of approximately 445 workers as compared to 696 workers associated with the proposed project. Because construction of the Wilmington Avenue/Interstate 405 Southbound Ramps could occur during the construction phase of Alternative 4, it is expected that construction traffic impacts at the Wilmington Ave./Interstate 405 Southbound Ramps would still exceed one or more applicable traffic impact significance thresholds. Therefore, the same construction traffic mitigation measure required for the proposed project would be required during the construction period for Alternative 4. Implementing the traffic mitigation measures is expected to reduce construction traffic impacts associated Alternative 4 to less than or significant and less than traffic impacts during construction of the proposed project.

6.4.5 ALTERNATIVE 5 – ALTERNATIVE CONSTRUCTION SCHEDULE

Air Quality: Construction emissions associated with the proposed project were considered significant for VOC and NOx, as well as the LSTs for NO_2 emissions (see Tables 4.2-2 and 4.2-3). Air quality impacts associated with construction of the proposed project would be reduced under Alternative 5 because construction activities would continue to overlap as much as they do under the proposed project but with less intensity. All project components would be constructed, but the construction activities would be more spread out (see Figure 6.3-1). Under Alternative 5, it is assumed that peak construction activities would be less than the proposed project, but construction of more project components would extend through 2021. The level of peak construction activities (including construction equipment) is also expected to be reduced by about 40 percent (see Table 6.4-5) because (some project components will be built on a more extended, less intensive, schedule (No. 51 Vacuum Unit, HTU 4, and LPG Rail Unloading facilities), or would be built later in the construction schedule (Wet Jet Treater, HTU-1 and HTU-2 modifications).

As shown in Table 6.4-5, air quality impacts from construction activities under Alternative 5 would be less than significant for VOC, CO, SOx, PM10 and PM2.5. Construction emissions for NOx, including LSTs, under Alternative 5 are expected to remain significant.

TABLE 6.4-5
Comparison of Proposed Project and Alternative 5
Peak Construction Emissions
(lb/day)

ACTIVITY	VOC	CO	NOx	SOx	PM10	PM2.5
Proposed Project Construction Emissions						
Proposed Project Construction Emissions[(a)]	106.65	515.54	575.73	1.41	68.55	38.67
SCAQMD Threshold Level	75	550	100	150	150	55
Significant?	**Yes**	**No**	**Yes**	**No**	**No**	**No**
Alternative 5 Estimated Construction Emissions						
Alternative 5 Construction Emissions[(b)]	63.99	303.32	345.44	0.85	41.13	23.20
SCAQMD Threshold Level	75	550	100	150	150	55
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**

a) See Table 4.2-2 for detailed construction emissions estimates.
b) Assumes construction activities are 60 percent of the construction activities for the proposed project.

In order for the construction emissions associated with the proposed project to be less than significant, there would need to be an 71 percent reduction in total NOx emissions. That level of emission reductions is not expected to be feasible given the need for construction equipment and workers required for construction/modifications to refinery units as all proposed project modifications (see Subsection 2.7 for a description of all proposed project components) would still occur. The construction emissions from rescheduling project components would lessen the daily emissions, but would not reduce all project construction emissions to less than significant. As a result, all construction mitigation measures required to reduce construction emission impacts under the proposed project would be required under Alternative 5. In spite of implementing these mitigation measures, it is expected that NOx construction emissions would be reduced in proportion to the proposed project (i.e., 40 percent). However, the reduced NOx emissions (i.e., 207.26 lb/day) would remain significant.

Under Alternative 5, the operational emissions would be the same as the proposed project after construction is completed in 2021 as all project components would be built and operational by that time. The same indirect project emissions and mobile source emission increases would also be expected to occur (see Table 4.2-4) as would occur under the proposed project. Under Alternative 5, the Wilmington Operations FCCU would be shut down in 2021 instead of 2017. Therefore, the Wilmington Operations FCCU would operate for four additional years resulting in a continuation of baseline emissions and, therefore, substantially greater emissions due to the delay in completion of construction over the proposed project (see Table 6.4-6) during this period. Delaying the shutdown of the Wilmington Operations FCCU would result in continued operational emissions of 318.96 pounds per day of VOC, 959.79 pounds per day of CO, 572.59 pounds per day of NOx, 416.38 pounds per day of SOx, 171.35 pounds per day of PM10, and 171.35 pounds per day of PM2.5 from 2017 through 2021. During the four-year delay in the completion of construction under Alternative 5, a total of 232.8 tons of VOC, 700.8 tons of CO, 418 tons of NOx, 304 tons of SOx, 125.2 tons of PM10 and 125.2 tons of PM2.5 would be emitted from the Wilmington Operations FCCU that would not occur under the proposed project. Continued operation of the Wilmington Operations FCCU during construction of Alternative 5 would not only eliminate the benefits of spreading construction out over a longer time frame, but would actually result in higher emissions during the construction period compared to the proposed project as construction emissions would overlap with the continued operation of the Wilmington Operations FCCU for a longer period of time.

TABLE 6.4-6

Operational Criteria Pollutant Emissions Between 2017 and 2021 Under Alternative 5

Sources	Emissions (lbs/day)					
	VOC	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5[(a)]**
Wilmington Operations FCCU Daily Emissions (lbs/day)[(b)]	318.96	959.79	572.59	416.38	171.35	171.35
Wilmington Operations FCCU Annual Emissions (lbs/year)[(a)]	116,420	350,323	208,995	151,979	62,543	62,543
Wilmington Operations FCCU Annual Emissions (tons/year)	58.2	175.2	104.5	76.0	31.3	31.3
Wilmington Operations FCCU Emissions from 2017 to 2021 (tons/4 years)	232.8	700.8	418	304	125.2	125.2

Note: Negative numbers represent emission reductions.
(a) See Table 4.2-4 for further details.
(b) The Wilmington Operations FCCU would not be shut down so the daily emissions associated with the FCCU operation would remain.

The operational emissions from the proposed project were considered to be less than significant, primarily due to the shutdown of the Wilmington Operations FCCU. Under Alternative 5, the operational emissions are expected to be higher than the proposed project because the Wilmington Operations FCCU would operate for four additional years than under the proposed project. Therefore, operational emission impacts from the proposed project would be less than operational impacts from Alternative 5 between the years 2017 and 2021 and less than significant under both scenarios. From 2021 on, operational air quality impacts from Alternative 5 would be less than significant and equivalent to the proposed project (see Table 4.2-4).

The cancer health risks from the proposed project were calculated to be less than the cancer risk significance threshold of ten in one million (ranging from 2.1 in one million at Bethune Mary School to 9.3~~2~~ in one million at the maximum exposed individual worker). Similarly, non-cancer health risks from the proposed project were calculated to be substantially less than the acute and chronic hazard index significance thresholds of 1.0 (0.052 for the maximum acute hazard index, 0.106~~127~~ for the maximum chronic hazard index, and 0.108 for the maximum 8-hr chronic hazard index). Therefore, cancer and non-cancer health risks from the proposed project are considered to be less than significant (see Table 4.2-13). Under Alternative 5, TAC emissions and associated cancer and non-cancer health risks from the Wilmington Operations FCCU would continue for four additional years compared to the proposed project. The TAC emission reduction benefits associated with the shutdown of the Wilmington Operations FCCU were not included as part of the HRA analysis in the EIR; however, under Alternative 5 these TAC emissions would continue to occur between 2017 and 2021 and would be unchanged compared to baseline conditions. The proposed project components would not become operational until 2021, after the turnaround is completed. At that time, TAC emissions associated with Alternative 5 are expected to be the same as the proposed project as the same project components would be constructed and operated. Therefore, TAC emissions and the resulting cancer and non-cancer health risks under Alternative 5 are also expected to be less than significant and equal to the proposed project after construction of the remainder of the project components is completed in 2021.

Hazards: The construction phase of the proposed project will require construction workers to excavate soil across the Wilmington Operations, the southeastern portion of the Carson Operations, and the Carson Crude Terminal, where construction of the new crude storage tanks will occur. Therefore, under the proposed project construction workers could encounter contaminated soils and groundwater during site excavation. Soil monitoring showed that the potential to generate hydrocarbon emissions from soil excavation is limited to the area along the pipeline route in the central portion of the Wilmington Operations where VOC emissions could exceed 50 ppm, which exceeds the SCAQMD Rule 1166 50 ppm limit that requires special handling procedures. However, because on-site worker safety equipment and training procedures would be in effect and the Refinery would be required to comply with numerous worker safety regulations, it was concluded that significant adverse health impacts to construction workers would not occur if contaminated soil or groundwater is encountered. Because construction activities and the locations of new equipment under Alternative 5 would be the same as those for the proposed project, it is assumed that construction worker health impacts from encountering contaminated soil or groundwater would be equivalent to the proposed project and also less than significant.

The hazard impacts associated with the proposed project are considered to be significant. Under the proposed project, hazards impacts associated with the Naphtha Isomerization Unit, new crude tanks, Interconnecting Pipelines, and SARP were considered to be significant as the hazard impacts could extend off-site. The Naphtha Isomerization Unit, new crude tanks, Interconnecting Pipelines, and SARP would continue to be built under Alternative 5, thus, generating the same significant adverse hazard impacts as would occur under the proposed project. As a result the same hazard mitigation measure identified for the proposed project would be required under Alternative 5. In spite of implementing these mitigation measures hazard impacts would remain significant. The hazards impacts under Alternative 5 are considered to be equivalent to the proposed project as Alternative 5 would still include the Naphtha Isomerization Unit, new crude tanks, Interconnecting Pipelines, and SARP which were considered to be significant as the hazard impacts could extend off-site. Therefore, the operational hazards under Alternative 5 would be the same as the proposed project and would be considered significant.

The proposed project would require increased transportation of fresh and spent caustic and LPG, but the hazard impact was determined to be less than significant. Spent sulfuric acid from the Wilmington Alkylation Unit is currently transported via six trucks per day to the ECO Services Dominguez Carson for recycling, a distance of approximately 5.55 miles. Following completion of the SARP, spent sulfuric acid from Wilmington Operations would be treated on-site and reused so that the transportation of spent sulfuric acid from Wilmington Operations would be eliminated, thus, reducing the sulfuric acid transport by over 6,000 truck miles per year. Under Alternative 5, the SARP would still be constructed and the transportation of hazardous materials would be the same as the proposed project once construction is completed because all proposed project components would be built under Alternative 5. Therefore, under Alternative 5, transportation hazards are expected to be less than significant and equivalent to the proposed project.

Hydrology/Water Quality: Total daily potable water demand during construction of the proposed project is expected to be a maximum of 40,000 gpd (10,000 gpd associated with dust suppression activities at the Wilmington Operations and up to 30,000 gpd for hydrostatic testing of new tanks and pipelines). Under Alternative 5, all of the proposed project components would be modified or constructed, but some would not become operational until 2021. The total daily potable water demand during construction of the proposed project is expected to be a maximum of 40,000 gpd (10,000 gpd associated with dust suppression activities at the Wilmington Operations and up to 30,000 gpd for hydrostatic testing of new tanks and pipelines), which is less than the significance threshold of 262,820 gpd. Construction activities under Alternative 5 are expected to be similar to the proposed project, but would occur over a longer timeframe. Therefore, water demand during construction activities under Alternative 5 are expected to be similar to the proposed project as the pipelines and storage tanks that require hydrostatic testing are also included under Alternative 5. The daily water demand during construction activities under Alternative 5 is expected to be less for dust suppression activities because fewer pieces of construction equipment would be operating, but similar to the proposed project for hydrostatic testing as the pipelines and storage tanks that require hydrostatic testing are also included under Alternative 5. Water demand associated with the proposed project construction activities was determined to be less than significant and water demand impacts associated with construction under Alternative 5 are also expected to be less than significant, but less than water demand under the proposed project.

Under the proposed project, water used for the hydrostatic testing new tanks and associated pipelines would be Refinery wastewater that is diverted for testing prior to discharge to the industrial sewer system. Using diverted wastewater will eliminate the need for using additional potable water supplies and will not increase the amount of wastewater generated by the Refinery, but will temporarily vary the discharge rate during construction. Wastewater associated with construction of the proposed project is expected to be discharged in compliance with existing IWDPs. Proposed project impacts on wastewater during construction activities were determined to be less than significant. Like the proposed project, under Alternative 5 wastewater used for the hydrostatic testing new tanks and associated pipelines would be Refinery wastewater that is diverted for testing prior to discharge to the industrial sewer system. Wastewater impacts during construction activities are expected to be the same as the proposed project and would be less than significant under Alternative 5 as well.

Operation of the proposed project is expected to result in an increase in water demand of about 191,275 gpd associated with modifications to the NHDS, No. 51 Vacuum, Alkylation, and Wet Jet Treater Units, as well as indirect water demand increases associated with cooling water, which was determined to be less than significant. Under Alternative 5, all of these project components would be included so that water demand impacts under Alternative 5 are expected to be the same as the proposed project, except that they would occur once construction is completed in 2021. As discussed in Subsections 3.4.1 and 4.4.2.1.2, the Refinery owns and operates private water wells to produce process water and purchases additional potable and reclaimed water to supplement the water drawn from the wells. As discussed in Subsection 4.4.2.1.2, the incremental increase in water demand of 191,275 gpd (approximately 69.8 million gallons per year) from the proposed project is expected to be produced by the privately-owned wells (i.e., from the available 1.2 billion gallons per year of adjudicated water rights). The existing water supply can meet the water demand of the proposed project. The water demand associated with Alternative 5 is expected to the same as the proposed project and the daily water demand associated with the Alternative 5 would also be met from privately-owned wells, except that the units would not start operating until 2021. Therefore, Alternative 5 water demand impacts after the completion of construction are expected to be the same as the proposed project and less than significant.

The proposed project was expected to reduce the overall amount of wastewater generated during operations at the Refinery by about 55.1 gpm (79,344 gpd) (see Table 4.4-2). This is due in large part, to the shutdown of the Wilmington Operations FCCU. While there will be an increase in wastewater generation from some operations, such as the SARP, adequate capacity in the existing wastewater treatment facilities is available as described in Section 4.4.2.1.1. Therefore, wastewater impacts from the proposed project were concluded to be less than significant. Under Alternative 5, the Wilmington Operations FCCU would also be shutdown, reducing wastewater generation from the Refinery; however, the FCCU would operate for an additional four years and wastewater discharge would not be reduced until the FCCU was shut down in 2021. Wastewater from operating the FCCU would remain at baseline levels until 2021, when the FCCU would be shut down. Therefore, wastewater impacts during operation of Alternative 5 would be less that significant, but would be greater than the proposed project. After the FCCU is shut down, wastewater impacts would be reduced, would be less than significant and would be equal to the proposed project.

Noise: The proposed project is expected to increase the noise levels at the Refinery due to the use of construction equipment and new Refinery equipment. Using the SoundPLAN model, the noise levels at the closest residential noise receptors are expected to increase from 0.1 to 0.9 dBA depending on the location and the time of day. The increased noise levels associated with the proposed project were considered less than significant during the construction phase of the proposed project as noise levels at off-site residential noise receptors were concluded to be less than the applicable noise significance thresholds. Implementation of Alternative 5 would spread out the construction schedule for a longer period of time but would reduce the numbers and types construction equipment and workers by an estimated 40 percent, compared to the proposed project during peak construction periods. Therefore, construction noise impacts under Alternative 5 are also less than significant and also expected to be less than the construction noise impacts from the proposed project.

Under the proposed project, construction would involve equipment and activities that may have the potential to temporarily generate groundborne vibration. Based on the activities and equipment that would be used during the proposed project's peak construction phases, the construction equipment source levels are estimated to range between 58 VdB and 100 VdB at a distance of 25 feet. The vibration from construction activities was concluded to be less than the applicable vibration significance threshold. Under Alternative 5, the numbers and types of construction equipment and workers are estimated to be approximately 40 percent, compared to the proposed project, during peak construction periods. Therefore, construction vibration impacts under Alternative 5 are also expected to be less than significant and less than construction vibration impacts from the proposed project.

Additional noise sources associated with the proposed project generally include process equipment components such as valves, flanges, vents, pumps, and compressors. The SoundPLAN model projected that the noise levels at three of the four noise receptor locations would be unchanged and at one location the noise level was projected to increase by 0.1 dBA which is well below the 3.0 dBA significance threshold (see Table 4.5-3). Based on SoundPLAN model results, increased noise levels associated with the proposed project were considered to be less than significant during the operational phase. Alternative 5 would result in the construction and operation of all the same project components as the proposed project, except that they would not all be operational until 2021. As a result, it is expected that operational noise impacts of Alternative 5 would be the same as the proposed project with noise increases an estimated 0.1 dBA, which is well below the 3.0 dBA significance threshold (see Table 4.5-3). When all of the proposed project components become operational in 2021, noise impacts under Alternative 5 would continue to be less than significant and equal to the proposed project.

Equipment associated with the operation of the proposed project is not expected to generate detectable groundborne vibration during normal operation because new equipment is not expected to have oscillating parts, which have the potential to generate groundborne vibration. Therefore, vibration impacts from operation of the proposed project are expected to be less than significant. Alternative 5 would result in the modification/construction and operation of all of the proposed project components, but all of the project components would not become operational until 2021. As a result, since the refinery units do not generate ground vibration, it is expected that any vibration impacts associated with the operation of Alternative 5 would be the same as the proposed project. Therefore, vibration impacts under Alternative 5 are expected to remain less than significant and equal to the proposed project.

Solid/Hazardous Waste: Construction activities associated with the proposed project involve grading and excavation activities that could generate solid waste. Demolition activities could generate demolition waste. Solid waste from constructing the proposed project were concluded to be less than significant because steel from demolition of tanks and piping is a commodity and would be recycled, while concrete foundations would be transported off-site for crushing and recycling or disposal at inert or municipal landfills, which have available capacity. The proposed project impacts on the generation of solid wastes were considered to be less than significant during construction. The magnitude of construction activities under Alternative 5 is expected to be the same as the proposed project as all proposed project components would be built; therefore, solid and hazardous waste impacts would be less than significant under Alternative 5 and equivalent to the proposed project.

Site preparation, grading, and construction activities for the proposed project have the potential to encounter contaminated soils or groundwater, which would require treatment or removal and disposal. The amount of contaminated soil that may be encountered during construction of the proposed project was concluded to be well below the daily disposal capacity of the available hazardous waste landfills, no significant impacts would occur from the proposed project and, therefore, was concluded to be less than significant. Construction activities under Alternative 5 would be similar to the proposed project, but since they would occur over a longer period of time, it is expected that the same amount of contaminated soil requiring disposal would be encountered during construction activities under Alternative 5 as compared to the proposed project. Since the total volume of contaminated soil encountered during the construction phase would be the same as the proposed project, hazardous waste disposal capacity under Alternative 5 would also be sufficient for disposal of contaminated soils, would be less than significant, and would be equivalent to the proposed project.

As indicated in Section 4.6.3, operation of the proposed project is not expected to affect in any way generation of solid waste as no increase in employees is expected and refinery units do not generally produce solid waste, so solid waste impacts during operation were concluded to be less than significant. The same is true under Alternative 5. Solid waste impacts from operation of Alternative 5 would be less than significant and equal to the solid waste impacts from the proposed project.

Following completion of the SARP in 2021, eight trucks per day would transport spent sulfuric acid from the Carson Operations to the SARP at the Wilmington Operations. All of the spent sulfuric acid from Wilmington Operations would then be treated on-site and reused, so recycling of spent sulfuric acid will not create an additional hazardous waste stream from the Refinery requiring disposal. Because Alternative 5 includes this same equipment, no significant adverse hazardous waste impacts associated with the handling of spent sulfuric acid would be expected, as would be the case under the proposed project.

The proposed project components that would generate hazardous waste would still be included in the project under Alternative 5. The Wet Jet Treater and SARP are expected to use caustic and generate spent caustic. Under Alternative 5, any increased generation of spent caustic would continue to be recycled so this impact is considered to be less than significant and equal to the proposed project when they begin operation.

The new storage tanks could require sludge removal approximately once every 20 years. Under Alternative 5, the new storage tanks would be constructed and become operational in 2021 as would be the case under the proposed project. The daily volume of waste generated during the periodic cleaning of the new storage tanks is expected to be about the same as current operations because no change in the method for tank cleaning is proposed and no more than one storage tank would be cleaned at any time. The sludge is expected to remain on-site and will be used as feedstock to the DCU (i.e., recycled on-site); therefore, no increase in waste disposal would be expected from operation of the new and modified storage tanks. Under the proposed project, all hazardous waste streams are expected to be reused or recycled (see Section 4.6.3). This would also be true under Alternative 5 regardless of when equipment is constructed and operated. Therefore, Alternative 5 is not expected to require additional waste disposal capacity and will not interfere with the Tesoro Refinery's ability to comply with existing federal, state, and local regulations for solid and hazardous waste handling and disposal. Therefore, hazardous waste impacts during operation of Alternative 5 would be less than significant and equivalent to the proposed project.

Traffic/Transportation: Construction traffic conditions under the proposed project were analyzed for the construction phase having the maximum number of construction trips (peak construction period) over the entire construction period. The analysis indicated that construction worker traffic associated with the proposed project would be less than significant at all affected intersections except one, the Wilmington Ave./Interstate 405 Southbound Ramps during the morning peak hour. The proposed project is expected to require about 696 construction workers. Peak construction activities under Alternative 5 are expected to be an estimated 40 percent less than the construction activities required for the proposed project, but would be spread out for a longer timeframe. Alternative 5 would require an estimated 420 construction workers. The construction traffic impacts associated with the proposed project are considered to be significant at the Wilmington Ave./Interstate 405 Southbound Ramps. Construction traffic impacts at this location were concluded to be significant, in part, because the southbound ramps are currently undergoing construction to improve traffic flow.

It is expected that construction traffic impacts at the Wilmington Ave./Interstate 405 Southbound Ramps would exceed one or more applicable traffic impact significance thresholds with the 420 construction workers under Alternative 5. The construction activities at the Wilmington Ave./Interstate 405 Southbound Ramps are expected to be completed in 2016 and well before the completion of the construction of the project under Alternative 5. However, it is still expected that the number of construction worker trips would still contribute to an exceedance of one or more traffic impact significance thresholds. Therefore, under Alternative 5, the same construction traffic mitigation measures required for the proposed project would be required during the construction phase. Implementing the traffic mitigation measures is expected to reduce construction traffic impacts from Alternative 5 to less than significant and less than construction traffic impacts from the proposed project.

6.5 CONCLUSION

6.5.1 COMPARISON OF ENVIRONMENTAL IMPACTS

Table 6.5-1 compares the potential environmental impacts of the various alternatives relative to the proposed project. Based on the analyses herein, no feasible alternatives were identified that would completely reduce or eliminate the potentially significant air quality impacts during construction or the potentially significant hazard impacts during operation, while achieving most of the objectives of the proposed project. Only Alternative 1, the No Project Alternative would eliminate all significant adverse impacts that would be caused by the proposed project.

The No Project Alternative would continue the operation of the Wilmington and Carson Operations under their current configurations and it would not achieve any of the proposed project objectives such as: (1) improving the efficiency of the Refinery, allowing the shutdown of the Wilmington Operations FCCU; (2) reducing overall emissions from the Refinery, including GHG emissions; (3) recovering and upgrading distillate range materials from FCCU feeds; (4) complying with federal, state, and local regulations; (5) improving the financial viability of the Refinery; (6) better integration of the Carson and Wilmington Operations; and (7) improving the efficiency of water-borne crude oil receipt and marine vessel unloading. Not only would Alternative 1 not achieve any of the proposed project objectives, but because portions of Alternative 1 do not include the regulatory compliance projects, it may not be considered a feasible alternative as the Tesoro Refinery would be in violation of regulatory mandates if not implemented.

Although Alternative 1 would eliminate all the significant and less than significant impacts that would occur under the proposed project, the locally beneficial impacts of the proposed project would also be eliminated. The Wilmington Operations FCCU would not be shut down because none of the refinery modifications needed for that to occur would be implemented. Finally, the beneficial aspects of the proposed project associated with reduced annual ship emissions due to the increased crude offloading rate (see Tables 4.2-9 and 4.2-11) would also be eliminated. Similarly, the overall reduction in wastewater generated during operation of the proposed project (79,344 gpd reduced) (see Table 4.4-2) would not occur. Consequently, Alternative 1 would continue current operational emissions, which would be substantially higher than operational emissions under the proposed project as the local emission reduction benefits associated with the proposed project would not be achieved (see Table 6.5-1).

TABLE 6.5-1

Environmental Impacts of Alternatives as Compared to Proposed Project

ENVIRONMENTAL TOPIC	Proposed Project	Alt. 1[a]	Alt. 2[b]	Alt. 3[c]	Alt.4[d]	Alt.5[e]
Air Quality						
Construction	S	NS(-)	S(=)	S(=)	S(-)	S(-)
Operation	NS	NS(+)	NS(+)	NS(+)	NS(+)	NS(+)
Toxic Air Contaminants	NS	NS(+)	NS(+)	NS(+)	NS(=)	NS(+)
Hazards						
Construction Hazards	NS	NS(-)	NS(=)	NS(=)	NS(=)	NS(=)
Operational Hazards	S	NS(-)	S(+)	S(+)	S(-)	S(=)
Transportation Hazards	NS	NS(-)	NS(=)	NS(=)	NS(-)	NS(=)
Hydrology/Water Quality						
Water Demand Construction	NS	NS(-)	NS(=)	NS(=)	NS(-)	NS(-)
Wastewater Construction	NS	NS(-)	NS(=)	NS(=)	NS(-)	NS(=)
Water Demand Operation	NS	NS(-)	NS(=)	NS(=)	NS(+)	NS(=)
Wastewater Operation	NS	NS(+)	NS(+)	NS(+)	NS(+)	NS(+)
Noise						
Construction Noise	NS	NS(-)	NS(=)	NS(=)	NS(-)	NS(-)
Construction Vibration	NS	NS(-)	NS(=)	NS(=)	NS(-)	NS(-)
Operational Noise	NS	NS(-)	NS(=)	NS(=)	NS(-)	NS(=)
Operational Vibration	NS	NS(-)	NS(=)	NS(=)	NS(-)	NS(=)
Solid/Hazardous Waste						
Construction Solid Waste	NS	NS(-)	NS(=)	NS(=)	NS(-)	NS(=)
Construction Haz. Waste	NS	NS(-)	NS(=)	NS(=)	NS(-)	NS(=)
Operation Solid Waste	NS	NS(=)	NS(=)	NS(=)	NS(=)	NS(=)
Operation Haz. Waste	NS	NS(-)	NS(+)	NS(+)	NS(-)	NS(=)
Transportation/Traffic						
Construction	MNS	NS(-)	MNS(=)	MNS(=)	MNS(-)	MNS(-)

Alternatives:
1 No Project
2 New FFHDS Fractionator at Carson Operations and New Diesel Hydrotreater at Wilmington Operations
3 New Gasoline Hydrotreater at Carson Operations
4 Interconnecting Pipelines and New Gasoline Hydrotreater at Carson Operations
5 Alternative Construction Schedule

Notes:
S = Significant, mitigation applied by impacts remain significant
NS = Not Significant
MNS = Mitigated, Not Significant
(-) = Potential impacts are less than the proposed project.
(+) = Potential impacts are greater than the proposed project.
(=) = Potential impacts are approximately the same as the proposed project.

TABLE 6.5-1 (Concluded)

(a) None of the objectives are met.
(b) Alternative 2 does not achieve the objectives of reducing overall emissions from the Refinery.
(c) Alternative 3 does not achieve the objectives of reducing overall emissions from the Refinery.
(d) Alternative 4 does not achieve the objectives of improving efficiency of the Refinery, reducing overall emissions from the Refinery, recovering and upgrading distillate range materials from FCCU feeds, or improving efficiency of water-borne crude receipts.
(e) Alternative 5 does not achieve the objectives of improving the efficiency and enabling shutdown of the Wilmington Operations FCCU by 2017. Operational emission reduction benefits would be delayed by five years. Other project objectives would be achieved but delayed due to the schedule.

Alternative 2 would result in significant adverse impacts to air quality during construction and hazards during operation and would require the construction of two additional new refinery units (FFHDS Fractionator and Diesel Hydrotreater). Construction of the new Refinery units would potentially result in higher air quality, water quality, hazard, and operational hazardous waste impacts than the proposed project. Alternative 2 would not reduce any of the potentially significant proposed project impacts to less than significant. Impacts to other environmental topic areas analyzed were generally equivalent to impacts in those same areas that would be generated by the proposed project.

Alternative 2 would achieve most the objectives of the proposed project, including: (1) improving the efficiency of the Refinery, allowing the shutdown of the Wilmington Operations FCCU; (2) reducing overall emissions from the Refinery, including GHG emissions; (3) recovering and upgrading distillate range materials from FCCU feeds; (4) complying with federal, state, and local regulations; (5) improving the financial viability of the Refinery; (6) better integration of the Carson and Wilmington Operations; and (7) improving the efficiency of water-borne crude oil receipt and marine vessel unloading. However, Alternative 2 would not achieve the objectives of reducing overall emissions from the Refinery as much as would the proposed project.

Alternative 3 would result in significant adverse impacts to air quality during construction and would result in greater operational GHG and criteria pollutant emissions associated with the two new heaters as compared to the proposed project. In addition, Alternative 3 also would result in significant adverse hazard impacts during operation. Alternative 3 would have greater impacts than the proposed project on operational air quality, wastewater, and hazardous waste impacts and it would not reduce any of the potentially significant adverse impacts of the proposed project to less than significant. Impacts to other environmental topic areas analyzed were generally equivalent to impacts in those same areas that would be generated by the proposed project.

Alternative 3 would achieve most the objectives of the proposed project, including: (1) improving the efficiency of the Refinery, allowing the shutdown of the Wilmington Operations FCCU; (2) reducing overall emissions from the Refinery, including GHG emissions; (3) recovering and upgrading distillate range materials from FCCU feeds; (4) complying with federal, state, and local regulations; (5) better integration of the Carson and Wilmington Operations; and (6) improving the efficiency of water-borne crude oil receipt and marine vessel unloading. Alternative 3 would require the installation of two new heaters, which means that this alternative would not achieve as effectively as the proposed project the objective of reducing overall emissions from the Refinery as a whole, including GHG emissions. Additionally,

Alternative 4 would result in significant adverse impacts to air quality during construction and hazards during operation; however, the impacts are expected to be less than the proposed project. Alternative 4 would eliminate the VOC significant construction air quality impacts and most of the hazard impacts. NOx emissions associated with the construction phase would remain significant under Alternative 4. The hazard impacts associated with the Interconnecting pipelines would remain significant under Alternative 4; however, Alternative 4 would eliminate the potentially significant hazards associated with Naphtha Isomerization Unit, new crude tanks, and SARP. Alternative 4 would have greater impacts than the proposed project on operational air quality, TAC emissions, and wastewater impacts as the FCCU would not be shut down under Alternative 4. Alternative 4 would not reduce any of the potentially significant adverse impacts of the proposed project to less than significant.

Alternative 4 would not accomplish the major objectives of the proposed project. Alternative 4 would meet the objective of better integration of the Carson and Wilmington Operations by constructing the Interconnecting Pipelines and complying with federal, state, and local regulations. However, Alternative 4 would not meet any of the other objectives of the proposed project including: (1) improving the efficiency of the Refinery, allowing the shutdown of the Wilmington Operations FCCU; (2) reducing overall emissions from the Refinery, including GHG emissions; (3) recovering and upgrading distillate range materials from FCCU feeds; and (4) improving the efficiency of water-borne crude oil receipt and marine vessel unloading. The beneficial aspects of the proposed project associated with reduced ship emissions due to the increased crude offloading rate (see Tables 4.2-9 and 4.2-11) would also be eliminated.

Alternative 5 would ultimately result in the same impacts as the proposed project in the areas of hazards, hydrology and water quality, noise, traffic and transportation, and solid and hazardous waste. Alternative 5 would reduce the peak construction emission impacts associated with the proposed project, but the construction emission impacts associated with NOx would remain significant. In addition, under Alternative 5 the Wilmington Operations FCCU would be shut down in 2021 instead of 2017, resulting in four additional years of operating the FCCU, which means that emissions from the FCCU would be unchanged from 2017 through 2021 and overall emissions during the construction phase would be substantially greater than what they would be under the proposed project. Alternative 5 would ultimately result in the same hazard impacts as the proposed project as all project components would be included in Alternative 5. Therefore, hazard impacts would remain significant. After all components of the proposed project are completed in 2021, Alternative 5 would have the same potentially less than significant and significant adverse environmental impacts as the proposed project.

Alternative 5 would achieve most the objectives of the proposed project, although there would be an approximately five-year delay in achieving some of the objectives, which would include: (1) improving the efficiency of the Refinery, allowing the shutdown of the Wilmington Operations FCCU; (2) reducing overall emissions from the Refinery, including GHG emissions; (3) recovering and upgrading distillate range materials from FCCU feeds; (4) better integration of the Carson and Wilmington Operations; and (5) improving the efficiency of water-borne crude oil receipt and marine vessel unloading. Alternative 5 would not achieve the objective of improving the efficiency and enabling shutdown of the Wilmington Operations FCCU by 2017. It also would delay a significant amount of local emission reductions, resulting in an additional five years of operation at increased rates. Under Alternative 5, it is assumed that the project components that would allow for the compliance with the U.S. EPA Tier 3 gasoline sulfur requirements would occur prior to 2017 so this objective would be achieved.

6.5.2 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA requires identification of the environmentally superior alternative in an EIR. There is no set methodology for comparing the alternatives or determining the environmentally superior alternative under CEQA. Therefore, the number of significant adverse impacts for the proposed project and each of the alternatives are compared. The alternative with the least number of significant unavoidable impacts and maintains the proposed project environmentally beneficial impacts aspects would be considered the environmentally superior alternative. If the environmentally superior alternative is the “no project” alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives (CEQA Guidelines §15126.6 (e)(2)).

As shown, in Table 6.5-1, the proposed project and Alternatives 2 through 5 would result in significant adverse impacts on two environmental resource areas (air quality during construction and operational hazard impacts). Alternative 1, the No Project Alternative would eliminate all adverse significant impacts making it the environmentally superior alternative.

Alternatives 2 and 3 would likely result in equivalent or more significant environmental impacts than the proposed project as additional new Refinery units would be constructed. However, under Alternatives 2 and 3 the Wilmington Operations FCCU would be shutdown, which is expected to provide large reductions in criteria pollutant emissions, GHG emissions, TACs emissions, and wastewater discharge. Both alternatives would also improve the efficiency of water-borne crude oil receipt and marine vessel unloading reducing the time it takes for marine vessels to unloading and reducing overall marine vessel emissions. Alternatives 3 would be the environmental superior alternative because it would reduce construction emissions from the proposed project and it would result in: (1) the shutdown of the Wilmington Operations FCCU which provides a number of environmental benefits; and (2) improvements in the efficiency of water-borne crude oil receipt that would reduce the time for marine vessels to unload crude, reducing overall marine vessel emissions.

Alternative 4 would reduce the scope of the proposed project and the overall construction activities; however, Alternative 4 would not allow the shutdown of the Wilmington Operations FCCU and would not improve the efficiency of water-borne crude oil receipt and marine vessel unloading. Consequently, Alternative 4 would continue current operational emissions from the FCCU, which would be substantially higher than operational emissions under the proposed project as the local emission reduction benefits associated with the proposed project would not be achieved (see Table 6.4-3). Therefore, the overall emissions, including criteria, GHG, and TACs, associated with Alternative 4 would be higher than the proposed project and higher than other alternatives. In addition, water demand and wastewater generation would be higher under

Alternative 4 than the proposed project because the Wilmington Operations FCCU would continue to operate. Therefore, Alternative 4 would not be the environmentally superior alternative.

Alternative 5 would extend the construction schedule associated with the proposed project over a five year period so that the full benefits of the proposed project would be achieved in 2021 instead of 2017. However, because operational emissions from the Wilmington Operations FCCU would continue until 2021, overall emissions during construction would be greater than under the proposed project. Therefore, Alternative 5 is not the environmentally superior alternative because greater operational emissions would occur due to the continued operation of the Wilmington Operations FCCU for an additional four years and no significant adverse impacts would be eliminated.

When balancing the environmental impacts with achieving the most project objectives, the proposed project is preferred because it would most effectively attain all project objectives. Although several alternatives meet many of the project objectives, none of the project alternatives would eliminate the potentially significant adverse construction air quality and hazard impacts, except Alternative 1, No Project Alternative. Alternative 3 would be similar in operational impacts to the proposed project and have less construction impacts, but would not eliminate significant project impacts or achieve all the project objectives.

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CHAPTER 7

REFERENCES

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ORGANIZATIONS AND PERSONS CONSULTED

The CEQA Statutes and Guidelines require that organizations and persons consulted be provided in the EIR. A number of organizations, state and local agencies, and private industry have been consulted. The following organizations and persons have provided input into this document.

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CHAPTER 8

ACRONYMS AND GLOSSARY

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8.0 ACRONYMS AND GLOSSARY

8.1 ACRONYMS AND ABBREVIATIONS

ABBREVIATION	DESCRIPTION
AB	Assembly Bill
AB1807	California Toxic Air Contaminants Program (Tanner Bill)
AB2728	Revised Tanner Bill
AB2588	Air Toxic "Hot Spots" Information and Assessment Act
AB2595	California Clean Air Act
AB32	Global Warming Solutions Act of 2006
AB 939	California Solid Waste Management Act
ACTA	Alameda Corridor Transportation Authority
API	American Petroleum Institute
ANS	Alaska North Slope
AQMP	Air Quality Management Plan
ARM	ambient ratio method
BACT	Best Available Control Technology
Basin	South Coast Air Basin
bbl	barrel
bbl/day	barrels per day
bgs	below ground surface
Bike Route	Class III Bikeway
BLEVE	Boiling Liquid Expanding Vapor Explosion
BMP	Best Management Practices
BNSF	BNSF Railway
BP	BP West Coast Products LLC
C	Carbon atom
CAAQS	California Ambient Air Quality Standards
CalARP	California Accidental Release Prevention Program
CalEPA	California Environmental Protection Agency
CalOSHA	California Occupational Safety and Health Administration
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
Cal Water	California Water Service Company
CAO	Cleanup and Abatement Orders
CARB	California Air Resources Board
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHP	California Highway Patrol
CH_4	Methane
CMP	Congestion Management Plan

ABBREVIATION	DESCRIPTION
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO_2	carbon dioxide
Cogen	Cogeneration Unit
CPUC	California Public Utilities Commission
CRU	Catalytic Reformer Unit
CUPA	Certified Unified Permitting Agencies
CWA	Clean Water Act
CWM	Chemical Waste Management
CWS	California Water Service
C_2H_6	Ethane
C_3H_8	Propane
C_3 olefins	Propylene
C_4H_{10}	Butane
C4 olefins	Butylenes
C5 olefins	Amylenes
dB	decibel
dBA	A-weighted noise level measurement in decibels
DCU	Delayed Cracker Unit
DOGGR	Department of Oil, Gas, and Geothermal Resources
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
DWR	Department of Water Resources
EFSEC	Energy Facility Site Evaluation Council
EIR	Environmental Impact Report
EPCRA	U.S. EPA Emergency Planning and Community Right-to-Know
ERPGs	Emergency Response Planning Guidelines
ERC	emission reduction credit
ERT	Emergency Response Team
FCCU	Fluid Catalytic Cracking Unit
FFHDS	Fluid Feed Hydrodesulfurization Unit
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
g/bhp-hr	gram per brake horsepower - hour
gpm	gallons per minute
G/D	Gasoline to Distillate
GVWR	gross vehicle weight rating
H	Hydrogen atom
HAZOP	Hazards and Operation Process
HCM	Highway Capacity Manual
HCU	Hydrocracker Unit
HCU (C)	Carson Hydrocracker Unit
HCU (W)	Wilmington Hydrocracker Unit
HDD	Horizontal Direction Drilling

ABBREVIATION	DESCRIPTION
HMTA	Hazardous Materials Transportation Act
HRA	Health Risk Assessment
HTU	Hydrotreater Unit
Hz	Hertz
ICTF	Intermodal Container Transfer Facility
ICU	Intersection Capacity Utilization
IWDP	Industrial Wastewater Discharge Permits
kV	kilovolt
LACFCD	Los Angeles County Flood Control District
LACFD	Los Angeles County Fire Department
LACSD	Los Angeles County Sanitation Districts
LADPW	Los Angeles Department of Public Works
LAER	Lowest Achievable Emission Rate
lb/hr	pounds per hour
lb/day	pounds per day
lb/yr	pounds per year
Leq	energy equivalent sound level
LHU	Light Hydrotreating Unit
LOS	Level of Service
LP	Linear Program
LPG	Liquefied Petroleum Gas
LRTP	Long Range Transportation Plans
LST	Localized Significance Threshold
LSWPPP	Local Storm Water Pollution Prevention Plan
MATES	Multiple Air Toxic Exposure Study
MCL	Maximum Contaminant Level
MH	Manufacturing Heavy
mmBtu/hr	million British Thermal Units per hour
$MMTCO_2e$	million metric tons of CO_2 equivalent
MTA	Metropolitan Transportation Authority
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
ND	Negative Declaration
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NHDS	Naphtha Hydro Desulfurization
NOP/IS	Notice of Preparation/Initial Study
NOx	nitrogen oxide
NO_2	Nitrogen Dioxide
NPDES	National Pollutant Discharge Elimination System
NSPS	New Source Performance Standards
N_2O	Nitrous Oxide
OSHA	Occupational Safety and Health Administration
PHL	Pacific Harbor Line, Inc.
PHMSA	Pipeline and Hazardous Material Safety Administration

ABBREVIATION	DESCRIPTION
PM	Particulate Matter
PM2.5	particulate matter less than 2.5 microns equivalent aerodynamic diameter
PM10	particulate matter less than 10 microns equivalent aerodynamic diameter
POLB	Port of Long Beach
ppbv	parts per billion by volume
ppm	parts per million
ppmv	parts per million by volume
PRD	pressure relief devices
PSD	Prevention of Significant Deterioration
psi	pounds per square inch
psig	pounds per square inch gauge
PSTU	Propane Sales Treating Unit
RECLAIM	Regional Clean Air Incentives Market
Refinery	Tesoro Los Angeles Refinery
RMP	Risk Management Plan
RTC	RECLAIM trading credit
RTP	Regional Transportation Plan
RVP	Reid Vapor Pressure
RWQCB	Regional Water Quality Control Board
SARP	Sulfuric Acid Regeneration Plant
SB1731	Senate Bill 1731
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCR	selective catalytic reduction
SHU	Selective Hydrotreating Unit
SJVAPCD	San Joaquin Valley Air Pollution Control District
SOx	sulfur oxide
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control and Countermeasure
SRP	Sulfur Recovery Plant
SUSMP	Standard Urban Storm Water Mitigation Plan
SWIRP	Solid Waste Integrated Resources Plan
SWPPP	Stormwater Pollution Prevention Plan
TACs	Toxic Air Contaminants
TAN	Total Acid Number
TDM	transportation demand management
Tesoro	Tesoro Refining & Marketing Company LLC
Tesoro Logistics	Tesoro Logistics Operations, LLC
T2	Marine Terminal 2
UPRR	Union Pacific railroad
U.S. DOT	United States Department of Transportation
U.S. EPA	United States Environmental Protection Agency

ABBREVIATION	**DESCRIPTION**
ug/m^3	micrograms per cubic meter
V/C	volume to capacity ratio
VdB	vibration decibels
VOC	volatile organic compounds
WWECP	Wet Weather Erosion Control Plan

8.2 GLOSSARY

TERM	DEFINITION
Acid	Any of a class of compounds that form hydrogen ions when dissolved in water. Acidic solutions react with bases and certain metals to form salts. Acids have a pH of less than 7.
Alkylation	The process of combining light olefins (typically, propylene and butylenes) with isobutene in the presence of a catalyst to form branched isoparaffins.
Ambient Noise	The background sound of an environment in relation to which all additional sounds are heard
Aromatics	Hydrocarbons with a ring structure with the same number of carbon and hydrogen atoms (C_nH_n), such as benzene (C_6H_6).
Barrel	42 gallons.
Blending	One of the final operations in refining, in which two or more different components are mixed together to obtain the desired range of properties in the finished product.
Carbon Intensity	The amount of carbon by weight emitted per unit of energy consumed. A common measure of carbon intensity is weight of carbon per British thermal unit (Btu) of energy.
Catalyst	A substance that promotes a chemical reaction to take place but which is not itself chemically changed.
Caustic	A substance capable of burning or corroding by chemical action (e.g., sodium hydroxide or caustic soda). Caustics have a pH of greater than 7.
Cogeneration	A cogeneration unit is a unit that produces electricity and steam.
Condensate	A stream that has been condensed back into liquid by either raising its pressure or lowering its temperature
Cooling Tower	A cooling tower is a heat rejection device, which extracts waste heat to the atmosphere through the cooling of a water stream to a lower temperature. Common applications for cooling towers are providing cooled water for manufacturing and electric power generation.

TERM	**DEFINITION**
Cracking	The process of breaking down higher molecular weight hydrocarbons to components with smaller molecular weights by the application of heat; cracking in the presence of a suitable catalyst produces an improvement in product yield and quality over simple thermal cracking.
Crude Oil	Crude oil is "unprocessed" oil, which has been extracted from the subsurface. It is also known as petroleum and varies in color, from clear to tar-black, and in viscosity, from water to almost solid.
dBA	The decibel (dDB) is one tenth of a *bel* where one bel represents a difference in noise level between two intensities I_1, I_0 where one is ten times greater than the other. (A) indicates the measurement is weighted to the human ear.
Delayed Coking Unit	The Delayed Coker Unit is a high temperature cracking unit where large hydrocarbon molecules are broken into small molecules (light hydrocarbons). The light hydrocarbons are sent to other units in the Refinery for the manufacture of products such as gasoline, diesel, and jet fuels. A tail gas stream is produced which is burned as fuel. The remaining material, called petroleum coke, is a solid and sold as a by-product.
Distillation	The process of heating a liquid to its boiling point and condensing and collecting the vapor.
Feedstock	Material used as a stream in the refining process.
Flares	Emergency equipment used to incinerate refinery gases during upset, startup, or shutdown conditions
Flue Gas	Gases produced by burning fuels in a furnace, heater or boiler.
Fluid Catalytic Cracking Unit	The primary function of a Fluid Catalytic Cracking Unit (FCCU) is to convert high boiling point gas oils to lighter gasoline blendstocks. In the presence of a catalyst larger hydrocarbons are "cracked" or broken into smaller hydrocarbons. A full range of hydrocarbons from methane to residue and coke are produced from the FCCU.
Heat exchanger	Process equipment used to transfer heat from one medium to another.

TERM	**DEFINITION**
Heater	Process equipment used to raise the temperature of refinery streams processing.
Hydrocarbon	Organic compound containing hydrogen and carbon, commonly occurring in petroleum, natural gas, and coal.
Hydrodesulfurization	See hydrotreating.
Hydrotreater	A process unit that performs hydrotreating (see hydrotreating).
Hydrotreating	A process to catalytically saturate unsaturated hydrocarbons such as olefins and aromatics and to remove impurities such as sulfur, nitrogen, and metals. In addition to the desired products, light hydrocarbon, hydrogen sulfide, and ammonia are formed. .
Isomerization	The rearrangement of straight-chain hydrocarbon molecules to form branch chain products; normal butane may be isomerized to provide a portion of the isobutane feed needed for the alkylation process.
L_{50}	Sound level exceeded 50 percent of the time (average or mean level).
Liquefied Petroleum Gas (LPG)	Liquefied light end gases often used for home heating and cooking; this gas is usually 95 percent propane, the remainder being split between ethane and butane.
Mercaptans	Sulfur-containing compounds
Naphtha	A crude distillation unit cut in the range of C_7-420^o; naphthas are subdivided – according to the actual crude distillation cuts - into light, intermediate, heavy, and very heavy virgin naphthas; a typical crude distillation operation would be: C_7-160$^{o\,-}$ light naphtha 160-280^o - intermediate naphtha 280-330^o- heavy naphtha 330-420^o- very heavy naphtha
Naphthenes	A group of hydrocarbons containing five to six carbon atoms configured in a ring structure with twice the number of hydrogen atoms as carbon atoms (C_nH_{2n}).

TERM	DEFINITION
Natural Gas	A mixture of hydrocarbon gases that occurs with petroleum deposits, with at least 80 percent methane (by volume) together with varying quantities of ethane, propane, butane, and other gases and of pipeline quality, such as the gas sold or distributed by any utility company regulated by the California Public Utilities Commission
Octane Quality or Octane Number	Measurement of the burning quality of the gasoline; reflects the suitability of gasoline to perform in internal combustion engines smoothly without letting the engine knock or ping.
Olefins	Hydrocarbons that contain at least two carbons joined by double bonds; olefins have twice the number of hydrogen atoms than carbons (C_nH_{2n}) and do not naturally occur in crude oils but are formed during the processing. The primary olefins in petroleum refining are propylene (C_3H_6) and butylenes (C_4H_8).
Paraffins	Hydrocarbons that are straight or branched (iso-) that have a chemical formula of C_nH_{2n+2}. Methane (CH_4) is the smallest paraffin and the largest parrafins can have over 100 carbon atoms.
Peak Hour	This typically refers to the hour during the morning (typically 7 a.m. to 9 a.m.) or the evening (typically 4 p.m. to 6 p.m.) in which the greatest number of vehicles trips are generated by a given land use or are traveling on a given roadway.
Pentane	A straight chain paraffin hydrocarbon, which is a colorless, flammable isomeric hydrocarbon, derived from petroleum and used as a solvent.
Reactor	Vessels in which desired reactions take place.
Refinery fuel gas	Gas produced from refinery operations used primarily for fuel gas combustion in refinery heaters and boilers. In SCAQMD Rule 431.1, defined as any combustible gaseous by-product generated from a petroleum refinery process unit operation, with a gross heating value of 2670 kilocalories per cubic meter (300 BTU per cubic foot) or higher, at standard conditions.
Reformate	One of the products from a reformer; a reformed naphtha; the naphtha is then upgraded in octane by means of catalytic or thermal reforming process.

TERM	DEFINITION
Reformer	A process unit that in the presence of a catalyst converts lower octane number straight-run naphtha compounds (e.g., paraffins) to higher octane number compounds such as isoparrafins and naphthenes and naphthenes into aromatics.
Slop Oil	A collection of oil, oil/water mixtures, and off-specification products gathered from refining operations and recycled back into the refining process.
Sour	Refinery streams with more than 2.5 percent sulfur.
Spent Acid	An acidic solution that has become weakened or contaminated and in longer useful. Spent sulfuric acid solutions can be regenerated to produce fresh sulfuric acid for reuse.
Spent Caustic	A caustic solution that has become exhausted and is no longer useful (or spent). Spent caustic streams are created during refining process steps for the removal of sulfur and other undesirable compounds.
Stripper or Splitter	Refinery equipment used to separate two components in a feed stream; examples include sour water strippers and naphtha splitters.
Sweet	Refinery streams with less than 0.5 percent sulfur.

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