CHAPTER 1

INTRODUCTION AND EXECUTIVE SUMMARY

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1.0 INTRODUCTION AND EXECUTIVE SUMMARY

1.1 INTRODUCTION

BP is proposing a safety, compliance and optimization project at its existing Carson Refinery (Refinery). The proposed project will involve physical changes and additions to multiple process units and operations as well as operational and functional improvements within the confines of the existing Refinery. The portion of the proposed project related to enhancing safety will focus on modifications to the Coker Gas Debutanizer pressure relief valve, as well as adding equipment to the Fluid Catalytic Cracking Unit (FCCU), Fluid Feed Hydrodesulfurization (FFHDS), vapor recovery system, and flare system. The portion of the proposed project related to compliance will involve physical modifications to existing refinery units including the FCCU, FFHDS, vapor recovery system, and flare system so as to comply with multiple South Coast Air Quality Management District (SCAQMD) rules (e.g., Rule 1105.1 – PM10 and Ammonia Emissions from Fluid Catalytic Cracking Units, Rule 1118 – Control of Emissions From Refinery Flares, and Rule 1173 – Control of VOC Leaks and Releases from Components at Petroleum Facilities and Chemical Plants) and to implement the terms of a settlement agreement between the SCAQMD and BP. Other modifications are proposed that will optimize operations relating to various existing refinery units including the FFHDS, the FCCU, the Alky Merox Unit, the Alkylation Unit, the Hydrocracker Unit, and the Sulfur Plant at the Refinery.

1.2 PURPOSE/LEGAL REQUIREMENTS

In accordance with §15121(a) of the California Environmental Quality Act (CEQA) Guidelines (California Administrative Code, Title 14, Division 6, Chapter 3), 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". The proposed project requires discretionary approval from the SCAQMD and, therefore, it is subject to the requirements of CEQA (Public Resources Code, §21000 et seq.).

CEQA Public Resources Code §21000 et seq., 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 approval from the SCAQMD for air quality permits for modifications to existing stationary source equipment and installation of new stationary source equipment. Therefore, the SCAQMD has the primary responsibility for supervising or approving the entire project as a whole and is the most appropriate public agency to act as lead agency (CEQA Guidelines §15051(b)).

To fulfill the purpose and intent of CEQA, the SCAQMD, as the lead agency for this project, prepared and released for a 30-day public review and comment period a Notice of Preparation and Initial Study (NOP/IS) to address the potential environmental impacts associated with the BP Carson Refinery Safety, Compliance, and Optimization Project (see Appendix A). ~~No~~ *Two* comments were received on the NOP/IS. *The comment letters and responses to the comments are provided in Appendix A.*

On November 7, 2003, the South Coast Air Quality Management District (SCAQMD) adopted Rule 1105.1 - Reduction of PM10 and Ammonia Emissions from Fluid Catalytic Cracking Units, and certified the Final Environmental Assessment for Proposed Rule 1105.1 (2003 Final EA, SCAQMD No. 012403BAR). The staff report for Rule 1105.1 and the 2003 Final EA identified six refineries that operate fluid catalytic cracking units (FCCUs) that would be subject to the requirements of Rule 1105.1 and one of these six was identified as already operating in compliance with the rule. One of the five refineries that will need to comply with Rule 1105.1, is operated by BP and modifications to comply with Rule 1105.1 are included as part of the proposed Safety, Compliance and Optimization Project. The 2003 Final EA assumed that the five refineries that would require modifications to comply with Rule 1105.1 would do so by installing new or modified electrostatic precipitators (ESPs). BP is proposing to comply with Rule 1105.1 by replacing two existing dry ESPs with one new (more efficient) ESP. Therefore, the assumptions for the Rule 1105.1 compliance portion of the proposed BP project is consistent with the assumptions used in the 2003 Final EA. However, the scope of the BP Safety, Compliance and Optimization Project includes modifications to a number of other refinery units and is much broader than the 2003 Final EA. Therefore, a separate CEQA document has been prepared for the proposed BP Safety, Compliance and Optimization Project.

1.3 SCOPE AND CONTENT

The NOP/IS was circulated for a 30-day comment period beginning on November 10, 2005. The NOP/IS was circulated to neighboring jurisdictions, responsible agencies, other public agencies, and interested individuals in order to solicit input on the scope of the EIR. ~~No comments~~ *Two comments* were received on the NOP/IS during the public comment period. *Responses to those comments are provided in Appendix A*. The NOP/IS formed the basis for and focus of the technical analyses in this ~~Draft~~ *Final* EIR. The following environmental issues were identified in the NOP/IS as potentially significant and are further addressed in this document:

- Air Quality,
- Hazards and Hazardous Materials,
- Noise,
- Transportation/Traffic.

The NOP/IS concluded that the proposed project would not create significant adverse environmental impacts to the following areas: aesthetics, agricultural resources,

biological resources, cultural resources, energy, geology and soils, hydrology and water quality, land use and planning, mineral resources, population and housing, public services, recreation, and solid and hazardous waste.

A discussion of potential cumulative impacts is also provided. The alternatives section of this ~~Draft~~ *Final* EIR is prepared in accordance with §15126.6 of the CEQA Guidelines. This section describes a range of reasonable alternatives that could feasibly attain the basic objectives of the proposed project or are capable of eliminating or reducing some of the significant adverse environmental effects associated with the proposed project.

1.4 RESPONSIBLE AGENCIES

CEQA Guidelines §15381 defines 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 following agencies may have ministerial permitting authority for aspects of modifications at the Refinery, and have been given an opportunity to review and comment on the NOP/IS and EIR; however, no new discretionary permits or permit modifications are expected to be required from these agencies for the proposed project:

- State Water Resources Control Board (SWRCB),
- Los Angeles Regional Water Quality Control Board (RWQCB), and
- City of Carson.

For convenience, all the above agencies will be referred to generally as Responsible Agencies in this EIR.

1.5 INTENDED USES OF THE EIR

The 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 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 cities, county planning commissions, etc., are responsible for making land use and planning decisions related to the proposed

project, they could possibly rely on this EIR during their decision-making process. See the preceding section for a list of public agencies' whose approval may be required and who may also be expected to use this EIR in their decision-making process.

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. After public notification and review of the NOP/IS, the SCAQMD received ~~no comments from the public~~ t*wo comments. The issues raised in the comments were addressed in the EIR and responses to those comments are provided in Appendix A.* Consequently, there are no areas of controversy known to the lead agency.

1.7 EXECUTIVE SUMMARY – CHAPTER 2: PROJECT DESCRIPTION

1.7.1 PROJECT LOCATION

The proposed project will occur at the BP Carson Refinery, which is located at 1801 East Sepulveda Boulevard in the City of Carson, California. The proposed modifications will occur entirely within the confines of the existing Refinery boundaries.

1.7.2 LAND USE AND ZONING

The Refinery is bounded by Wilmington Avenue on the west, 223rd Street on the north, Alameda Street on the east, and Sepulveda Boulevard on the south. The Dominguez Channel flows through the Refinery, dividing the property into two sections: Northeastern and Southern. Industrial and commercial facilities and transportation corridors (e.g., 405 freeway and Alameda Corridor) surround the Refinery.

To the east of the BP Refinery is the Alameda Corridor and other industrial facilities including the BP Coke Barn, the Air Products Hydrogen Plant, and the Shell Sulfur Plant. Commercial and residential areas lay to the west. The ConocoPhillips Refinery, a cold storage warehouse facility and tank farms occupy the area south of the Refinery. The Refinery and all adjacent properties are zoned manufacturing heavy (MH). The closest residential area to the Refinery is approximately 300 feet from the property line across Wilmington Avenue to the southwest of the Refinery. The closest residential area to the units associated with the proposed project is approximately 3,000 feet away (also southwest of the Refinery).

1.7.3 EXISTING REFINERY CONFIGURATION AND OPERATION

Crude oil used to produce gasoline and other petroleum products at the Refinery is delivered by ship to the marine terminal located in the Port of Long Beach and pumped to the Refinery by existing pipelines. The crude oil is then processed in the crude units,

heated, and distilled into multiple feedstock components that are later processed elsewhere in the Refinery. The feedstocks are refined into the major Refinery products such as unleaded gasoline, diesel, jet fuel, petroleum gases, petroleum coke, and sulfur. During the refining process, elemental sulfur and petroleum coke are produced as by-products. The major categories of processing units at the Refinery include the following units: 1) crude and vacuum distillation; 2) coking; 3) catalytic reforming; 4) hydrocracking; 5) hydrotreating; 6) fluid catalytic cracking; 7) alkylation; 8) sulfur recovery; and, 9) other auxiliary systems. Auxiliary systems include a hydrogen plant (to produce hydrogen needed for certain refinery reactions), boilers to produce steam, cogeneration plant to produce electricity, and wastewater treatment. Finished products are transported by pipeline to BP distribution terminals located throughout California and adjacent states.

1.7.4 PROPOSED PROJECT MODIFICATIONS TO THE REFINERY

The proposed project modifications are outlined in this section. All components of the proposed project focus on enhancing safety, achieving compliance, and optimizing the operations of the existing Refinery. Many components of the proposed project are primarily related to modifications of the FCCU and other related units. Additional modifications are related to reducing refinery flaring.

1.7.4.1 Modify Existing Fluid Catalytic Cracking Unit

The FCCU processes heavier feedstocks, known as gas oils, which are then upgraded into lighter components used for gasoline blending. The proposed project will involve several changes to the FCCU and related systems, such as required modifications to comply with Rule 1105.1 and other proposed changes that will improve the operational efficiency of the FCCU. To comply with the PM10 and ammonia emissions standards in Rule 1105.1, BP is proposing to replace their existing flue gas air pollution control system for the FCCU, which consists of two dry electrostatic precipitators (ESPs), with one new dual chamber ESP.

In addition, other proposed modifications to the FCCU will involve changes in piping, heat exchangers, pumps, as well as modifications to the internal configuration of the FCCU vessels. The overall effect of these modifications will not increase the capacity of the FCCU. Modifications to three systems of the FCCU are proposed including the Gas Plant, the Preheat, and the Disengager Reactor Modifications. The Gas Plant modifications will mainly involve improvements to heat exchangers, pumps, and piping. Modifications proposed to the Absorber Overhead Cooler, Absorber Bottoms Reboiler, Rerun Overhead Condensers, Rerun Overhead Product Coolers, and replacement of the Rerun Overhead Pumps would allow recovery of more FCC gasoline. The Feed Preheat Modifications mainly involve improvements to heat exchangers and piping to improve heat recovery and increase feed preheat temperature. The Disengager Reactor modifications would upgrade the Rough Cut Cyclone gas outlet tubes to reduce internal reactor erosion.

1.7.4.2 Install New Fluid Feed Hydrodesulfurization Reactor

BP currently has one FFHDS reactor that removes sulfur compounds from the feed to the FCCU to produce lower sulfur end products as well as lower stack emissions. BP is proposing to install a second FFHDS reactor to run in parallel with the existing FFHDS reactor so that the FFHDS can run for longer periods of time between turnarounds. The proposed project will also allow the FFHDS to remove more sulfur from the feed, resulting in a lower sulfur product that is fed to the FCCU.

1.7.4.3 Modify Existing Alky Merox Unit

The purpose of the Alky Merox unit is to remove sulfur-containing compounds from the olefin feed streams to the Iso-Octene and Alkylation units, and therefore, produce lower sulfur gasoline blending component products from the Iso-Octene and Alkylation Units. Currently, the Alky Merox unit does not have the capability of processing all of the olefin streams produced at the Refinery. Producing lower sulfur gasoline is desirable because low sulfur gasoline results in fewer sulfur oxide emissions from mobile sources that use the fuel, plus it complies with local, state and federal sulfur content limitations for gasoline.

The current capacity of the Alky Merox unit is limited to processing approximately 600 barrels per hour. Olefins are fed through the Extractor to the Water Wash Tower. Sour olefins are fed to the extractor to reduce the concentration of sulfur containing compounds. The capacity of the Extractor is also currently limited to processing 600 barrels per hour. The proposed modifications to the Alky Merox unit will increase the Extractor capacity to 1,000 barrels per hour, which will be large enough to process all of the olefins at the Refinery. The proposed modifications will also include installing new vessels, piping, and other ancillary equipment.

1.7.4.4 Modify Existing Alkylation Unit

The main function of the Alkylation Unit is to convert olefins into alkylate. BP plans to purchase additional olefin feed as part of the proposed project. Also, as a result of the proposed modifications to the FCCU, more olefin is expected to be produced. BP expects that the existing Iso-Octene unit will be capable of processing a portion of the additional olefin, and the Alkylation Unit will process the balance. To handle the processing of additional olefin, BP proposes to increase the olefin feed throughput to the Alkylation Unit by approximately 15 percent. The proposed modifications to the Alkylation unit will primarily affect piping, pumps, heat exchangers, and other ancillary equipment. Additionally, modifications are proposed to the Deisobutanizer, Debutanizer, and Depropanizer towers to improve capacity, efficiency, and product quality.

1.7.4.5 Modify Existing Hydrocracker Unit

The Hydrocracker Unit processes high sulfur diesel feeds into both ultra-low sulfur diesel and gasoline blending components. The throughput of the Hydrocracker Unit is currently

limited by the availability of the fractionation gas plant, the capacity of the distillation tower, and by other product cooling constraints. Hydraulic constraints in the reaction section of the Hydrocracker Unit also limit the feed rate. An increased fractionation gas plant capacity will be achieved by converting the lean oil absorber tower to a low pressure diethanolamine (DEA) scrubber tower so that the fractionator overhead compressor's feed gas can be processed into fuel gas. BP proposes to replace the liquid/gas distributor trays in the reaction section with new, state of the art trays. This proposed change will result in more efficient use of the catalyst and allow higher feed rates. BP proposes to increase the feed throughput to the Hydrocracker unit by approximately 10 percent by addressing these limitations. The proposed project also includes modifying piping, controls, and ancillary equipment.

1.7.4.6 Modify Existing Coker Gas Debutanizer Pressure Relief Valve

To comply with Rule 1173, BP is proposing to replace the pressure relief valve on the Debutanizer Tower and route the future emergency gas releases to an existing flare.

1.7.4.7 Modify Existing Sulfur Plant

BP's existing Sulfur Plant currently converts hydrogen sulfide and ammonia-rich acid gases into elemental sulfur, water, and nitrogen. The current capacity of the Sulfur Plant is permitted to produce 449.33 long tons per day (LT/D) of elemental sulfur from the four Claus Units (A, B, C and D). The proposed modifications will help the sulfur plant to consistently operate at higher production rates closer to, without exceeding, the permitted capacity.

BP proposes to increase the production rates without exceeding the permitted capacity of the Sulfur Unit with the following modifications:

- Change the solvent in the main amine system from DEA to methyl diethanolamine (MDEA) to allow more amine circulation since MDEA is effective at higher concentrations.

- Change the "C" Claus Unit to allow oxygen enrichment up to 28 percent.

- Add oxygen injection to "D" Claus Unit.

1.7.4.8 Modify Existing Vapor Recovery System

BP's existing vapor recovery system collects vent gases from process units and tanks, which are then treated to remove sulfur before being routed to various flares throughout the Refinery. The vapor recovery system is comprised of multiple compressors and has a combined maximum compression capacity of 355,000 standard cubic feet per hour (SCFH). BP is currently operating below this level because one vapor recovery compressor (the No. 7 unit) permitted at 95,000 SCFH is not functional.

As part of the March 2005 settlement agreement between the SCAQMD and the operators of BP Carson Refinery, BP agreed to implement a Supplemental Environmental Project (SEP) that would increase the capabilities of the existing vapor recovery system to collect and treat vent gases that would otherwise vent to the refinery flares. The SEP requires BP to increase the total vapor compression capacity by a minimum of 195,000 SCFH. BP proposes to accomplish part of this obligation by replacing the No. 7 vapor recovery compressor with a new 95,000 SCFH vapor recovery compressor, intercooler, and knockout drum. This will restore the compression capacity in the Vapor Recovery Unit to 355,000 SCFH.

As part of the March 2005 settlement agreement between the SCAQMD and the BP Carson Refinery, BP agreed to implement a Supplemental Environmental Project (SEP) that would increase the capabilities of the existing vapor recovery system to collect and treat vent gases that would otherwise vent to atmosphere or the flares, with a priority placed on maximizing collection of vent gas streams with high sulfur content. The gases that vent to the Coker Flare were selected for control due to their higher sulfur content, which will maximize the reduction of sulfur emissions. The SEP requires BP to increase the total vapor compression capacity by a minimum of 195,000 SCFH. BP proposes to accomplish part of this obligation by replacing the No. 7 vapor recovery compressor with a new 95,000 to 140,000 SCFH vapor recovery compressor, intercooler, and knockout drum. This proposed modification will restore the compression capacity in the Vapor Recovery Unit to *at least* 355,000 SCFH.

In addition, the SEP requires BP to invest at least $20 million to achieve the remaining 100,000 SCFH of vapor compression capacity. BP intends to apply the $20 million by proposing the following improvements: (1) install *150,000* ~~100,000~~ SCFH of reciprocating compressor capacity for flare gas recovery with exchangers, knockout drums, and a new electrical power supply; (2) install a new water seal on the Coker Flare to allow recovery of flare gas; (3) install a flow meter on the Coker Flare to measure the net flow of gas to the flare; (4) install a tie-in from the compressor discharge to the Coker Gas Plant Amine Treating Unit to remove hydrogen sulfide from the recovered gas; (5) upgrade the existing vapor recovery caustic gas treating system to improve its ability to handle peak loads; (6) add interstage cooling and knock out drums to the existing No. 5 and No. 6 Vapor Recovery Compressor systems to increase the availability of the systems; and (7) add pressure, oxygen, and flow measurement instruments to monitor the operation and performance of the vapor recovery system.

This SEP will reduce emissions from the Refinery by increasing the capability of the Refinery's existing vapor recovery system to collect and treat vent gases and will add the capability to collect and treat gases that previously would vent to the Refinery's flares.

1.7.4.9 Install New North Area Flare Gas Recovery System

BP is proposing modifications to the existing North Area Flares to comply with Rule 1118 - Control of Emissions from Refinery Flares. The proposed modifications will

recover flare gas from the flares located in the north area of the Refinery (e.g., FCCU, Hydrocracker Unit, FFHDS, and No. 5 flares). To reduce the overall sulfur emissions from the Refinery, BP proposes to install the following: (1) two compressors with a compression capacity between 70,000 and ~~100,000~~ *150,000* SCFH each and the associated coolers and knock out drums; (2) new piping connections from the FCCU, Hydrocracker Unit, FFHDS, and No. 5 flares; (3) water seals for the FCCU and Hydrocracker Unit flares to enable flare gas recovery; (4) a tie-in to the existing amine regeneration system for the removal of hydrogen sulfide; and (5) electrical, controls, and utilities required to operate the system.

1.7.4.10 Modify Pressure Relief Devices

BP has been reviewing the compliance of certain pressure relief devices (PRDs) with the SCAQMD permit conditions. The SCAQMD has indicated for some PRDs that currently vent to atmosphere, BP will need to connect these PRDs to a closed system for vapor recovery. Currently, BP will be required to connect a total of 13 PRDs to a closed system in the FCCU, Reformer, Crude, Alkylation, Alky Merox, Supercritical Fractionation and Isomerization Area (SFIA), 52 Vacuum Unit, and Coker Unit. In all cases, the modifications will involve the installation of piping so that in the event of an overpressure situation, the emissions from the PRD will be controlled instead of venting to the atmosphere. BP is currently in negotiations with the SCAQMD on the extent of these requirements so detailed engineering has not been completed on these projects. The environmental impacts of this portion of the proposed project are expected to result in emission decreases by controlling a currently uncontrolled source of emissions.

1.7.4.11 Environmental Benefits of the Proposed Project

The environmental benefits of the proposed project include the following:

- The proposed project will increase the production of low sulfur gasoline by about 20,000 gallons per day without increasing the crude throughput.

- The proposed project will increase the production of ultra-low sulfur diesel and jet fuel (less than 15 ppm sulfur) by about 29,000 gallons per day and 121,800 gallons per day respectively, without increasing the crude throughput.

- The proposed project is expected to reduce PM10 emissions from the FCCU due to the replacement of existing air pollution control equipment with new ESPs.

- The proposed project is expected to reduce emissions from flaring by capturing gas flows to the flare in the flare gas recovery system. This will reduce the combustion of gases from the flare.

- The proposed project is expected to reduce gas flows to the flares, as well as combustion emissions from flaring activities by capturing released gas in the flare gas

recovery system prior to incineration in the FCCU, Hydrocracker, FFHDS and No.5 flares.

- Two pressure relief devices in the Coker Gas Debutanizer Unit will be tied into the flare system improving the safety of the system and reducing potential VOC emissions.

1.7.4.12 Construction of the Proposed Project

Construction activities for most aspects of the proposed project are expected to begin during the fourth quarter of 2006, and be completed by the second quarter of 2008. The construction activities for the proposed modifications to the Vapor Recovery System and Flare Gas Recovery Projects are expected to begin during the second quarter of 2007 and be completed in the second quarter of 2009.

1.7.4.13 Operation of the Proposed Project

The permanent work force at the Refinery is expected to increase by about four additional workers as a result of the proposed project. The proposed project is expected to incrementally increase traffic by about eight trucks per day associated with the delivery or transport of additional materials including sulfur, oxygen, and particulate matter from the FCCU (Rule 1105.1 compliance). In addition, about one additional railcar per year will be required to transport catalyst to the FCCU.

1.7.4.14 Permits and Approvals

The Refinery has numerous environmental permits from a variety of federal, state, and local agencies. The proposed project may require new permits or modifications to existing permits (e.g., air permits and building permits).

1.8 EXECUTIVE SUMMARY – CHAPTER 3: EXISTING ENVIRONMENTAL SETTING

This chapter presents the existing environmental setting for the proposed project and compares it to the potential impacts of the proposed project that have been previously evaluated. 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 considered in this EIR, and the rationale for inclusion or exclusion of each environmental topic. The environmental topics identified in Chapter 3 include both a regional and local setting.

1.8.1 AIR QUALITY

Over the last decade and a half, air quality has substantially improved within the SCAQMD's jurisdiction. Nevertheless, several air quality standards continue to be frequently exceeded by a wide margin. For example, of the National Ambient Air Quality Standards (NAAQS) established for six criteria pollutants [ozone, lead, sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), and particulate matter less than 10 microns in diameter (PM10)], the area within the SCAQMD's jurisdiction is only in attainment with the state standard and the NAAQS for SO_2, NO_2, and lead. Chapter 3 provides a brief description of the existing air quality setting for each criteria pollutant as well as for toxic air contaminants.

1.8.2 HAZARDS AND HAZARDOUS MATERIALS

The Refinery handles hazardous materials with the potential to cause harm to 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. Typical hazards at a refinery include toxic gas clouds, fires, vapor cloud explosions, thermal radiation, and overpressure. 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.

1.8.3 NOISE

The vicinity of the Refinery is an urban environment characterized by extensive industrial, commercial, transportation-related and some residential land uses. The ambient noise environment in the vicinity of the Refinery is comprised of contributions from equipment and operations within multiple commercial and industrial areas, from rail road activities, from traffic on the major transportation routes (Interstate 405, 223rd Street, Wilmington Avenue, Sepulveda Boulevard, and Alameda Street), and from other individual activities in the area.

Traffic, both vehicular and railroad, is a major source of noise in the area. The 405 Freeway is a major noise source at the Refinery since it is elevated above most buildings; therefore, the 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 Refinery such that railroad activities are a source of noise in the area. Although there are numerous sources of noise in the area, there are few sensitive receptors (i.e., residential areas, hospitals, rest homes, and schools) in the Carson/Wilmington area near the Refinery. There are no residential areas, hospitals, rest homes or schools within one-quarter mile of the operating portions of the Refinery.

The nearest commercial receptor is located northwest of the Refinery, just west of Wilmington Avenue and south of 223rd Street. The nearest industrial receptor is located just west of the Refinery and Wilmington Avenue and south of 230th Street.

The community noise exposure level (CNEL) (74 and 75) in commercial areas are in the high range for "conditionally acceptable" land use compatibility guidelines. The existing CNEL in the vicinity of the closest residences is 63 to 71 dBA (residences southwest of the Refinery and northwest of the Refinery, respectively) and are in the "normally unacceptable" range for their land use category. Traffic along 223rd Street is the major contributor to noise levels.

1.8.4 TRANSPORTATION AND TRAFFIC

There are four major freeways which bound the Refinery. Additionally, there are four major surface streets which provide arterial access to the Refinery. 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/Long Beach to provide more efficient movements of goods and materials in to and out of the port areas.

The operating characteristics of an intersection are defined in terms of the level of service (LOS), which describes the quality of traffic flow based on variations in traffic volume and other variables such as the number of signal phases. 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 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. Four intersections are estimated to operate at LOS D or E in 2008 (without the proposed project) including Wilmington Avenue and 223rd Street, Wilmington Avenue and Sepulveda Boulevard, Alameda Street and Sepulveda Boulevard, and 223rd Street and Alameda Street (at Wardlow access). All other intersections operate at LOS A, B or C.

In addition to the freeway system, railroad facilities service the Refinery providing an alternative mode of transportation for the distribution of goods and materials. The area is served by the Southern Pacific (SP), Union Pacific, and Santa Fe, Pacific Electric and Harbor Belt 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.

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

Chapter 4 assesses the potential environmental impacts of the construction and operation of the BP Safety, Compliance, and Optimization 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."

1.9.1 AIR QUALITY

1.9.1.1 Environmental Impacts

The SCAQMD makes significance determinations based on the maximum daily emissions during the construction period, which provides a "worst-case" analysis of the construction emissions. Similarly, significant determinations for operational emissions are based on the maximum daily emissions during the operational phase.

Construction Emissions: Construction emissions for the proposed project are summarized in Table 4-3, together with the SCAQMD's daily construction threshold levels. The construction phase of the proposed project at the BP Carson Refinery will exceed the significance thresholds for CO, VOC, NOx, and PM10. Therefore, the air quality impacts associated with construction activities are considered significant.

Operational Emissions: Total operational emissions from the proposed project are summarized in Table 4-4, together with the SCAQMD's daily operational threshold levels. Operational activities associated with the proposed project is not expected to exceed the SCAQMD significance thresholds for any pollutant. The proposed project is also expected to provide emission reduction benefits associated with the increased availability of low sulfur gasoline and diesel fuel for sale and use in Southern California, the reduction in PM10 emissions from the FCCU, the reduction of combustion of gases from the flare, and the reduction of VOC emissions from the Coker Gas Debutanizer Unit. Following completion of the construction phase, the proposed project is expected to have an overall beneficial impact on air quality. Therefore, the air quality impacts associated with operational emissions from the proposed project are less than significant.

Toxic Air Contaminants: A health risk assessment (HRA) was performed to determine if emissions of toxic air contaminants (TAC) generated by the proposed project would exceed the SCAQMD thresholds of significance for cancer risk and is included as Volume II to this EIR. The results of the HRA were used to evaluate the impacts of toxic air contaminants from the proposed project. It is worth noting that the proposed project will phase out the use of DEA (a TAC) in the Sulfur Recovery Plant and replace it with MDEA, which is not a toxic air contaminant, reducing the potential TAC emissions from

the Refinery. Therefore, implementation of the proposed project is not expected to result in significant cancer risks from toxic air contaminants.

1.9.1.4 Mitigation Measures

A number of feasible mitigation measures have been imposed on the proposed project to mitigate the potentially significant adverse impacts associated with construction emissions. The mitigation measures include the development of a Construction Emission Management Plan, limiting truck idling to five minutes, using electricity wherever possible, maintaining construction equipment, using an emulsified diesel fuel or equivalent alternative diesel fuel throughout the construction phase, if commercially available, suspending construction activities during first stage smog alerts, developing and implementing a fugitive dust emission control plan, and using lower VOC content coatings.

1.9.1.5 Level of Significance after Mitigation

Construction emissions of CO, VOC, and NOx for the proposed project are expected to remain significant following mitigation (see Table 4-7). The construction emissions associated with SOx and PM10 are expected to be less than significant. However, construction emissions are expected to be short-term as they will be eliminated following completion of the construction phase of the proposed project.

1.9.2 HAZARDS AND HAZARDOUS MATERIALS

1.9.2.1 Environmental Impacts

At the Refinery, four existing units, the Hydrocracker, FCCU, Alkylation Unit and Alky Merox Unit, have the ability to create a hazard that could extend off-site. The proposed modifications to the Hydrocracker Unit would increase the distance for exposure to hydrogen sulfide to occur offsite. The proposed modifications to the FCCU would also increase the distance that a pool or torch fire could extend offsite. The proposed modifications to the Alkylation Unit and Alky Merox Unit would also increase the distance that a flash fire could extend offsite. Therefore, the potential hazard impacts associated with the proposed project are considered to be significant because there is the potential for some individuals to be exposed to potential hazards that would exceed the significance thresholds.

Most of the hazard impacts are confined to heavy industrial or commercial areas surrounding the facility. Releases from new or modified equipment that result in an increase in the potential off-site exposure (based on the consequence modeling and the given hazard endpoints), do so only under "worst-case" conditions. For the "worst-case" scenarios evaluated to occur, the following conditions must be met: 1) a full rupture of a pipeline within the unit occurs; 2) the release does not ignite within minutes of the rupture; 3) the wind speed is low (less than three miles per hour); and, 4) the atmosphere is calm. The occurrence of this sequence of events is highly unlikely and would only

result in an off-site hazard (toxic or flammable vapor dispersion) for a limited number of potential releases.

1.9.2.2 Mitigation Measures

An Risk Management Program (RMP) has been prepared for the Refinery for several chemicals including but not limited to hydrogen sulfide, ammonia and chlorine. Of these chemicals, the proposed project is only expected to result in increased hazards associated with hydrogen sulfide at the Refinery. The RMP consists of four main parts: 1) hazard assessment that includes an off-site consequence analysis; 2) five-year accident history; 3) prevention program; and, 4) emergency response program. The Refinery's existing RMP will need to be reviewed and revised to include the new and modified refinery units and to ensure that no unexpected or adverse interactions with existing systems occur. Such reviews are required as part of the RMP, California Accidental Release Prevention Program (CalARP), and Process Safety Management (PSM) programs for covered processed. It is expected that such reviews will take place if the threshold quantities of regulated substances are exceeded for any component of the proposed project. No additional feasible mitigation measures have been identified for the proposed project, over and above the extensive safety regulations that currently apply to the Refinery.

1.9.2.3 Level of Significance Following Mitigation

Compliance with existing regulations and implementation of the recommended safety measures would further minimize the potential impacts associated with an accidental release, but are not expected to eliminate the potential hazard impacts. No additional 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.

1.9.3 NOISE

1.9.3.1 Environmental Impacts

Construction Noise Levels: The noise levels from the construction equipment that will be operated at the Refinery during implementation of the proposed project are expected to be within the allowable noise levels established by the City of Carson noise ordinance. The proposed project is not expected to increase the noise levels at residential areas. The noise level at the closest residential area is expected to be 64 dBA which is within the normally acceptable noise range. The noise levels at the other noise monitoring locations are within industrial areas and no significant (audible) increase in noise levels is expected. No significant noise impacts related to construction activities associated with the proposed project are expected. Therefore, the noise impacts during the construction phase of the proposed project are expected to be less than significant.

Operational Noise Levels: Refinery operations are continuous over a 24-hour period. The maximum noise level of installed new equipment or modified existing equipment at

the Refinery is expected to be limited to 85-90 dBA at three feet in order to comply with OSHA and the City of Carson noise standards. These noise specifications will be enforced and included as part of the equipment purchase agreement for all new and modified equipment. Given the 85 dBA criteria for refinery equipment, it is expected that the maximum noise level from several pieces of equipment operating concurrently would be about 90 dBA. Assuming an operational "worst-case" noise level of 90 dBA, and six dBA noise attenuation for every doubling distance, noise levels would drop to 60 dBA or less at about 1,000 feet from the noise sources. Noise generated by equipment affected by the proposed projectis not expected to increase the overall noise levels at the Refinery (when compared to baseline conditions). Therefore, no significant noise impacts related to operation activities associated with the proposed project are expected. The noise levels in the area of the Refinery following completion of construction of the proposed project are expected to be about the same as the current levels.

1.9.3.2 Mitigation Measures

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

1.9.3.3 Level of Significance Following Mitigation

The proposed project is expected to comply with local noise ordinance, so no significant impacts on noise are expected.

1.9.4 TRAFFIC AND TRANSPORTATION

1.9.4.1 Environmental Impacts

Construction Traffic Levels: The construction activities associated with the proposed project will create additional traffic from travel by construction workers to and from the Refinery, as well as from the transportation of materials and equipment to the Refinery. Two intersections are expected to show a change in the LOS due to the construction phase of the proposed project, if the work shift ends during peak traffic conditions. The intersection of 223rd Street/Alameda Street/Wardlow Access is expected to change from LOS D to LOS E and the Gate 60 and 223rd Street intersection will change from LOS B to LOS D. The traffic change at both of these intersections is considered to be a significant adverse impact. The LOS at the other local intersections is expected to remain unchanged. However, the proposed project will increase the volume-to-capacity ratio by more than two percent at two other intersections that are currently operating at LOS D, if the work shift ends during peak traffic conditions. The intersections of Wilmington Avenue/223rd Street, and Alameda Street/Sepulveda Boulevard are currently operating at LOS D. The proposed project would increase the volume-to-capacity at these two intersections by more than two percent (i.e., 4.7 and 21.6 percent, respectively), resulting in potentially significant increases in traffic. Therefore, impacts of the proposed project on traffic during the construction phase would be considered significant.

Operational Traffic Levels: Once constructed, implementation of the proposed project will increase the permanent number of workers at the Refinery by four additional workers. The increase in the number of workers is relatively minor as the local streets typically handle vehicle trips in the magnitude of 25,000 or more vehicles per day.

The proposed project will result in a maximum increase of eight additional truck trips per day traveling to and from the Refinery. Since these trips would mainly consist of material deliveries, they would be spread throughout the workday with few deliveries occurring during the peak hour. Therefore, their contribution to overall traffic impacts would be negligible. No significant adverse traffic impacts during operation of the proposed project are expected.

1.9.4.2 Mitigation Measures

Construction traffic associated with implementing the proposed project is expected to result in a significant adverse impact at the intersections of Wilmington Street/223rd Street, and Alameda Street/Sepulveda Boulevard, 223rd Street/Alameda Street (at Wardlow access), and the BP Refinery Gate//223rd Street, if the work shift ends during the evening peak hours. The following mitigation measure would reduce traffic impacts to less than significant.

T-1 The hours for the construction work shifts shall avoid starting or ending the shift during the peak traffic hours of 7:00 AM to 8:00 AM and 4:30 PM to 5:30 PM. This will avoid workers traveling during the peak traffic hours and eliminate potentially significant traffic impacts.

The potentially significant adverse transportation and traffic impacts during construction of the proposed project are expected to be mitigated to less than significant.

1.10 EXECUTIVE SUMMARY – CHAPTER 5: SUMMARY OF CUMULATIVE IMPACTS

CEQA Guidelines §15130(a) requires an EIR to discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in §15065(a)(3). There are a number of projects proposed for development in the vicinity of the Refinery, which may contribute cumulative impacts as compared to the impacts expected to be generated by the proposed BP Carson Refinery Safety, Compliance and Optimization Project. These include other refinery and industrial projects such as the Alameda Corridor Transportation Authority projects, as well as other projects planned in the City of Carson.

1.10.1 AIR QUALITY

1.10.1.1 Environmental Impacts

Construction Impacts: Air quality impacts due to construction of the proposed project along with the other cumulative projects in the area are expected to be significant since the SCAQMD thresholds will be exceeded. Table 5-2 summarizes the available construction emissions data for the related projects. On a cumulative basis, construction emissions would exceed the thresholds established by the SCAQMD assuming they occur at the same time. Therefore, the cumulative air quality construction impacts are considered significant. Mitigation measures to reduce air emissions associated with construction activities are necessary primarily to control emissions from heavy construction equipment and worker travel.

Operational Impacts: The operation of the BP Safety, Compliance, and Optimization Project will not exceed the SCAQMD thresholds, so no significant air quality impacts are expected from the proposed project.

Air quality impacts associated with cumulative projects are also expected to be less than the SCAQMD mass emissions thresholds for CO, NOx, SOx and PM10. On a cumulative basis, only the emissions of VOCs are expected to exceed the SCAQMD mass emission thresholds. Therefore, the cumulative air quality impacts for CO, NOx, SOx, and PM10 are expected to be less than significant. The cumulative air quality impacts of VOCs are expected to be significant.

Toxic Air Contaminant Impacts: Impacts of the proposed project on health effects associated with exposure to toxic air contaminants is expected to be below the CEQA significance thresholds and, therefore, less than significant. Impacts of the proposed project are not expected to contribute to cumulative impacts and are not considered to be cumulatively considerable. Cumulative impacts of toxic air contaminants on health are expected to be less than significant.

1.10.1.2 Mitigation Measures

For the construction period, the mitigation measures developed as part of the proposed project should be imposed on other related projects, since cumulative emissions are significant.

Mitigation measures for other projects will be required on a case-by-case basis. A BACT review will be completed during the SCAQMD permit approval process for all new/modified sources.

1.10.1.3 Level of Significance Following Mitigation

The cumulative adverse air quality impacts due to construction activities are expected to exceed the SCAQMD significance thresholds and are considered to be cumulatively

considerable. The cumulative air quality impacts due to operational activities are expected to exceed the SCAQMD significance thresholds for VOC emissions only and are considered to be cumulatively considerable. The cumulative air quality impacts due to operational activities are expected to be less than significant for CO, NOx, SOx, and PM10. The project-specific toxic air contaminant health impacts would not be significant, and are not considered to be cumulatively considerable.

1.10.2 HAZARDS AND HAZARDOUS MATERIALS

1.10.2.1 Environmental Impacts

Although other refineries and industrial facilities exist in the general vicinity of the Refinery, the cumulative impacts from and between the onsite operational activities associated with the other industrial projects are not expected to be significant because it is extremely unlikely that upset conditions would occur at more than one facility at a time due to the distance between facilities. It is extremely unlikely that an upset condition at one facility would create an upset at another nearby refinery because of the distance between facilities. The closest refinery to BP is the ConcoPhillips Carson Plant which is located south of Sepulveda Boulevard. The new project-related explosion or fire hazard impacts associated with the proposed project are expected to travel less than 1,000 feet, or stay within the confines of the existing Refinery. Therefore, explosion or fire hazards are not expected to reach the other local refineries or industrial projects, so hazard impacts are not expected to be cumulatively considerable.

1.10.2.2 Mitigation Measures

Impacts of the proposed project on hazards are considered to be significant. A number of existing rules and regulations apply to the Refinery and other industrial facilities that handle, transport or store hazardous materials. Compliance with these rules and regulations is expected to minimize industry-related hazards. Compliance with these rules and regulations should also minimize the hazards at other refineries and industrial facilities located in the area of the BP Carson Refinery. Site-specific mitigation measures for hazards may be required for other projects.

1.10.2.3 Level of Significance After Mitigation

The impacts of the proposed project combined with other projects in the area of the Refinery on hazards are not expected to be cumulatively considerable as hazards at or within one project area and are not expected to impact or lead to hazards at other facility locations.

1.10.3 NOISE

1.10.3.1 Environmental Impacts

Construction Impacts: The cumulative noise impacts associated with the construction of the proposed project along with the related refinery projects and industrial projects are not expected to be significant or exceed noise ordinances. The BP Refinery and other industrial projects are at a sufficient distance apart that the noise levels are not expected to overlap. Residential areas are located adjacent to the southwest corner of the BP Refinery property at a sufficient distance from the BP Refinery and other construction projects in the area so that cumulative noise impacts would not be expected at the closest residential areas to the Refinery.

Operational Impacts: The noise impacts associated with operational activities of the proposed project along with the related refinery and industrial projects in the area are not expected to be significant. Most of the Carson/Wilmington area is industrialized and the cumulative increase in noise is not expected to adversely impact residential areas since they are near the southwestern boundary of the BP Refinery, about one-half mile away from the operating portions of the Refinery. Also, about one mile separates the BP Refinery from other refinery and industrial properties in the area; thus, it is unlikely that noise impacts will overlap. The new BP administration building or storage tanks are not expected to be a noise source, once construction is complete, because it will replace an existing administration building and no new traffic is expected to be created.

Existing noise levels from traffic in the vicinity are already considered unacceptable for certain residential areas. Operation of the Alameda Corridor concentrates train and truck noise along the corridor while reducing overall noise on other highways and railways. Therefore, the cumulative traffic noise impacts from ACTA projects, that include modifications to State Route 47 (SR-47) may be significant.

The noise impacts from the proposed project are not expected to be cumulatively considerable because other projects are located sufficient distance (about 0.5 mile) from the BP Refinery so that noise impacts do not overlap and residential areas are located about one-half mile from the operating portions of the Refinery. The SR-47 project is located several miles from the BP Carson Refinery, so there is sufficient distance to reduce the potential for cumulative noise impacts.

1.10.3.2 Mitigation Measures

Since noise impacts from implementing the proposed project are not considered to be cumulatively considerable, they do not contribute to significant adverse cumulative impacts. As a result, no mitigation measures are required. Mitigation measures will be expected to be required for the SR-47 ACTA project since portions of SR-47 runs adjacent to residential areas.

1.10.3.3 Level of Significance After Mitigation

The noise impacts during both construction and operation activities remain significant for the construction of the ACTA project modifications (i.e., SR-47 modifications) because SR-47 runs adjacent to residential areas. The noise impacts associated with the other refinery and industrial projects in the area are not expected to be significant or contribute to significant adverse cumulative noise impacts during construction or operation of the proposed project.

1.10.4 TRANSPORTATION AND TRAFFIC

1.10.4.1 Environmental Impacts

Construction Impacts: Traffic impacts associated with the construction of the proposed project is expected to be mitigated to less than significant by altering the work schedules of construction workers to avoid peak hour traffic. Therefore, it is not expected that the proposed project will have cumulative traffic impacts with other projects in the area. However, there could be cumulative construction traffic impacts associated with other industrial construction projects in the area that do not avoid peak traffic hours.

Construction of the ACTA projects would require improvements to SR - 47 which could result in disruption to the local traffic circulatory system, creating detours and affecting accessibility to businesses. Construction impacts on traffic associated with modifications to SR - 47 are considered significant.

Operational Impacts: The cumulative traffic impacts were calculated assuming an ambient traffic growth rate of 0.25 percent per year from year 2005 to year 2020 with no changes in existing intersection geometrics. Cumulative impacts were expected to be significant at four intersections including Wilmington Avenue/223rd Street, Wilmington Avenue/Sepulveda Boulevard, Alameda Street/Sepulveda Boulevard, and 223rd Street/Alameda Street.

1.10.4.2 Mitigation Measures

Construction traffic associated with the proposed project is expected to be mitigated to less than significant by altering the construction work schedules to avoid peak hour traffic. Implementation of this mitigation measure will deter workers from traveling during the peak traffic hours and will eliminate potentially significant traffic impacts. Implementation of the proposed project during the operational phase will have less than significant impacts on traffic. On a cumulative basis, general growth in the area may result in significant adverse traffic impacts. Though this projected increase in traffic is unrelated to the proposed project, it is related to the general population growth in the area such that mitigation measures will need to be developed as new traffic generating projects are proposed in the City of Carson's General Plan.

1.10.4.3 Level of Significance After Mitigation

The proposed project is not expected to result in significant traffic impacts. The cumulative adverse impacts of population growth on traffic are expected to be significant at four intersections.

1.11 EXECUTIVE SUMMARY – CHAPTER 6: SUMMARY OF ALTERNATIVES

This EIR identifies and compares the relative merits of a range of reasonable alternatives to the proposed project as required by the CEQA guidelines. According to the CEQA Guidelines, alternatives should include realistic measures to attain the basic objectives of the proposed project and provide a means for evaluating the comparative merits of each alternative. In addition, though the range of alternatives must be sufficient to permit a reasoned choice, they need not include every conceivable project alternative (CEQA Guidelines, §15126.6(a)). The key issue is whether the selection and discussion of alternatives fosters informed decision making and public participation.

Alternatives to the proposed project included the Alternative 1 - No Project Alternative; Alternative 2 – Compliance Only Projects; and Alternative 3 – Alternative Control Strategies SCAQMD Rule 1105.1 Compliance. Based on the analyses herein, no feasible alternatives were identified that would reduce or eliminate the potentially significant air quality or hazard impacts related to the proposed project and achieve the objectives of the proposed project.

The No Project Alternative (Alternative 1) would: 1) prevent BP from complying with SCAQMD Rule 1105.1, 1118 or 1173; 2) prevent BP from complying with the settlement agreement; 3) prevent BP from improving safety at the Refinery; and, 4) prevent BP from producing additional quantities of low sulfur gasoline, and ultra-low sulfur diesel and jet fuel without increasing the crude throughput capacity of the BP Carson Refinery. However, the No Project Alternative would eliminate the potentially significant adverse impacts related to air quality during construction activities and hazards/hazardous materials impacts during operation.

Alternative 2 would result in significant impacts to air quality during construction activities but would eliminate the potentially significant impacts associated with the hazards due to the modifications to the FCCU, Hydrocracker Unit, Alkylation Unit, and Alky Merox Unit. Therefore, Alternative 2 would be considered the environmentally superior alternative as it would eliminate one of the potentially significant impacts (hazards). However, Alternative 2 would not allow the Refinery to meet the project objective of producing additional quantities of low sulfur gasoline, and ultra low sulfur diesel and jet fuel without increasing the crude throughput capacity of the Refinery. Therefore, the proposed project is preferred because it would attain all project objectives.

Alternative 3 would have similar impacts as the proposed project for hazards/hazardous materials, noise and traffic. Alternative 3 could have potentially greater impacts than the proposed project on aesthetics, air quality, water demand/water quality, and energy. Therefore, the proposed project is preferred because it would attain all project objectives, with potentially fewer environmental impacts.

1.12 EXECUTIVE SUMMARY – CHAPTER 7 AND 8: 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.

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