CHAPTER 3

EXISTING ENVIRONMENTAL SETTING

Introduction
Air Quality
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3.0 EXISTING ENVIRONMENTAL SETTING

3.1 INTRODUCTION

CEQA Guidelines §15125 requires that an EIR include a description of the environment within the vicinity of a proposed project as it exists at the time the NOP/IS is published, or if no NOP/IS is published, at the time the environmental analyses commences, from both a local and regional perspective. This chapter presents the existing environmental setting for the proposed project against which potential impacts of the project have been evaluated. This chapter also describes the existing environment around the Refinery that could be adversely affected by the proposed project. This EIR is focused only on the environmental topics identified in the Notice of Preparation/Initial Study (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 this chapter include both a regional and local setting.

3.2 AIR QUALITY

The current air quality setting at the BP Carson Refinery and the surrounding areas are presented in this section.

The BP Carson Refinery is located within the SCAQMD jurisdiction (referred to hereafter as the district). The district consists of the four-county South Coast Air Basin (Basin), that includes Orange, and the non-desert portions of Los Angles, Riverside, and San Bernardino counties, the Riverside County portions of the Salton Sea Air Basin (SSAB), and the Mojave Desert Air Basin (MDAB). The Basin is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east.

3.2.1 METEOROLOGICAL CONDITIONS

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^{o}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.

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 the 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), other 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 account for approximately 63 percent of VOC emissions, 90 percent of the NOx emissions, 57 percent of the sulfur dioxide (SOx) emissions, 97 percent of the carbon monoxide (CO) emissions, and 14 percent of the particulate matter less than ten microns (PM10) emissions in the Basin (SCAQMD, 2003).

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 3-1). National Ambient Air Quality Standards 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 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 continuously equal to or less than the air quality standards.

Health-based air quality standards have been established by the U.S. EPA and the CARB for ozone, CO, NOx, PM10, SOx, and lead. The California standards are 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. The Basin is designated as non-attainment for CO, PM10, and ozone for both state and federal standards. The Basin, including the project area, is classified as attainment for both the state and federal standards for NOx, SOx, sulfates, and lead.

3.2.4.2 Regional Air Quality

The SCAQMD monitors levels of various criteria pollutants at 30 monitoring stations. In 2004, the district exceeded the federal and state standards for ozone at most monitoring locations on one or more days. The federal and state one-hour ozone standards were exceeded 28 and 111 days respectively. The East and Central San Bernardino Mountains and the Santa Clarita Valley exceeded standards most frequently. Other areas that exceeded the state ozone standards included the San Gabriel Valley, San Fernando Valley, Riverside County including the Coachella Valley and San Bernardino Valley.

In 2004, 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 has yet to take action on the request or the plan.

The federal PM10 standards were not exceeded in the Basin in 2004. The state PM10 standards were exceeded at all of the monitoring locations in the Basin including the coast, central Los Angeles, San Fernando Valley, San Gabriel Valley, Santa Clarita Valley, Central Orange County, Riverside County, the Coachella Valley, and San Bernardino County. The state standard was exceeded on a total of 81 days in the Basin in 2004. The federal PM2.5 standard was exceeded on seven days.

In 2004, neither federal nor state standards for NOx, SOx, lead and sulfates were exceeded. Currently, the district is in attainment with the ambient air quality standards for lead, SOx, and NOx (SCAQMD, 2003).

TABLE 3-1

Federal and State Ambient Air Quality Standards

	STATE STANDARD	FEDERAL PRIMARY STANDARD	MOST RELEVANT EFFECTS
AIR POLLUTANT	CONCENTRATION/ AVERAGING TIME	CONCENTRATION/ AVERAGING TIME	
Ozone	0.09 ppm, 1-hr. avg. > 0.070 ppm, 8-hr	0.08 ppm, 8-hr avg>	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals (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 altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage
Carbon Monoxide	9.0 ppm, 8-hr avg. > 20 ppm, 1-hr avg. >	9 ppm, 8-hr avg.> 35 ppm, 1-hr avg.>	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
Nitrogen Dioxide	0.25 ppm, 1-hr avg. >	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	0.04 ppm, 24-hr avg.> 0.25 ppm, 1-hr. avg. >	0.03 ppm, ann. avg.> 0.14 ppm, 24-hr avg.>	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)	20 $\mu g/m^3$, ann. arithmetic mean > 50 $\mu g/m^3$, 24-hr average>	50 $\mu g/m^3$, annual arithmetic mean > 150 $\mu g/m^3$, 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, especially in children
Suspended Particulate Matter (PM2.5)	12 $\mu g/m^3$, ann. Arithmetic mean	15 $\mu g/m^3$, annual arithmetic mean> 65 $\mu g/m^3$, 24-hour average>	Decreased lung function from exposures and exacerbation of symptoms in sensitive patients with respiratory disease; elderly; children.
Sulfates	25 $\mu g/m^3$, 24-hr avg. >=		(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 $\mu g/m^3$, 30-day avg. >=	1.5 $\mu g/m^3$, calendar quarter>	(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 (10am – 6pm PST)		Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent

The SCAQMD predicts that the Basin will comply with the federal PM10 requirements by 2006, and the federal one-hour ozone standard by 2010 (SCAQMD, 2003). Compliance with the state standards for ozone and PM10 are not expected until after 2010 (SCAQMD, 2003). The 2007 AQMP will include the attainment demonstration for PM2.5 by 2014 and the eight-hour ozone standard by 2021.

3.2.4.3 Local Air Quality

The project site is located within the SCAQMD's South Coastal Los Angeles County monitoring area. Recent background air quality data for criteria pollutants for the South Coast Los Angeles County monitoring station are presented in Table 3-2. The area has shown a general improvement in air quality with decreasing or consistent concentrations of most pollutants (see Table 3-2). Air quality in the South Coastal Los Angeles County monitoring area complies with the state and federal ambient air quality standards for CO, NOx, SOx, lead, and sulfate. The air quality in the area also is in compliance with the federal eight-hour ozone standard, and the 24-hour and annual PM10 standard. The air quality in the South Coast Los Angeles County area is not in compliance with the state and federal one-hour average ozone standard and the 24-hour PM10 and PM2.5 standards.

3.2.4.4 BP Carson Refinery Criteria Pollutant Emissions

Operation of the existing BP Carson Refinery results in the emissions of criteria pollutants. The reported emissions of criteria air pollutants from the Refinery for the last two-year period are shown in Table 3-3. The emissions in Table 3-3 are based on actual operations and not the maximum potential to emit. The BP Carson Refinery is permitted for higher emissions than presented in Table 3-3.

3.2.4.5 Toxic Air Contaminants

The California Health and Safety Code (§39655) defines a toxic air contaminant (TAC) as an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health. Under California's TAC program (Assembly Bill 1807, Health and Safety Code §39650 et seq.), the 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 TACs 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 Refinery is located closest to the North Long Beach station. A summary of the averaged data from 2004 monitoring from the Long Beach station for various TACs is considered to be an appropriate estimate of the TAC concentration in the vicinity of the Refinery (see Table 3-4).

TABLE 3-2

Ambient Air Quality South Coastal Los Angeles County Monitoring Station Maximum Observed Concentrations (2001 – 2004)

CONSTITUENT		2001	2002	2003	2004
Ozone:	1-Hour (ppm)	0.091	0.084	0.090	0.12
	Federal Standard	(0)	(0)	(0)	(0)
	State Standard	(0)	(0)	(0)	(3)
	8-Hour (ppm)	0.07	0.065	0.075	0.08
		(0)	(0)	(0)	(0)
Carbon Monoxide:					
	1-Hour (ppm)	6.0	6.0	4	10.0
		(--)	(0)	(0)	(0)
	8-Hour (ppm)	4.71	4.6	3.4	5.8
		(0)	(0)	(0)	(0)
Nitrogen Dioxide:					
	1-Hour (ppm)	0.13	0.13	0.12	0.14
		(--)	(0)	(0)	(0)
	Annual (ppm)	0.0308	0.0298	0.0280	0.0313
PM10:					
	24-Hour (ug/m^3)	91	74	72	105
	Federal Standard	(0)	(0)	(0)	(0)
	State Standard	(17%)	(8.6%)	(6.7%)	(21%)
	Annual (ug/m^3)				
	Geometric	34.8	34.1		34.0
	Arithmetic	37.4	35.9	33.1	37.6
PM2.5:					
	24-Hour (ug/m^3)	72.9	62.7	66.6	81.5
	Federal Standard	(0.3%)	(0%)	(0.3%)	(1.3%)
	Annual Arithmetic Mean	21.4	19.5	17.6	19.2
Sulfur Dioxide:					
	1-Hour (ppm)	0.05	0.03	0.04	0.05
		(0)	(0)	(0)	(0)
	24-Hour (ppm)	0.012	0.008	0.012	0.014
		(0)	(0)	(0)	(0)
Lead:					
	30-Day (ug/m^3)	0.05	0.03	0.02	0.05
		(0)	(0)	(0)	(0)
	Quarter (ug/m^3)	0.04	0.02	0.01	0.04
		(0)	(0)	(0)	(0)
Sulfate:					
	24-Hour (ug/m^3)	15.9	17.8	15.9	26.7
		(0%)	(0%)	(0%)	1**

Source: SCAQMD Air Quality Data Annual Summaries 2000-2004.

Notes: (18) = Number of days or percent of samples exceeding the state standard, -- = Not monitored, ppm = parts per million, ug/m^3 = micrograms per cubic meter, * = Less than 12 full months of data, so data may not be representative. ** = 1 day exceeded 24 hour state standard.

TABLE 3-3

BP Carson Refinery Baseline Criteria Pollutant Emissions (Tons/Year)

Reporting Period	CO	VOC	NOx	SOx	PM10
2003-2004	422	526	667	1,144	255
2004-2005	489	745	892	1,220	342
Average Baseline Emissions [1]	455.5	635.5	779.5	1,182	298.5

[1] Baseline emissions are based on the annual emission fee reports prepared for the SCAQMD during July 2003 through June 2004 and July 2004 and June 2005.

The SCAQMD measured TAC concentration as part of its Multiple Air Toxic Exposure Study, referred to as the MATES-II study. The purpose of the study is to provide an estimate of exposure to TACs to individuals within the Basin. The SCAQMD conducted air sampling at about 24 different sites for over 30 different TACs between April 1998 and March 1999. The SCAQMD has released a Final Report from this study which indicates the following: (1) cancer risk levels appear to be decreasing since 1990 by about 44 percent to 63 percent; (2) mobile source components dominate the risk; (3) approximately 70 percent of all risk is attributed to diesel particulate emissions; (4) about 20 percent of all risk is attributed to other toxics associated with mobile sources; (5) about 10 percent of all risk is attributed to stationary sources; and (6) no local "hot spots" have been identified. The average carcinogenic risk in the Basin is about 1,400 per million people. This means that 1,400 people out of a million are susceptible to contracting cancer from exposure to the known TACs over a 70-year period of time. The cumulative risk averaged over the four counties (Los Angeles, Orange, Riverside, San Bernardino) of the Basin is about 980 in one million when diesel sources are included and about 260 in one million when diesel sources are excluded. Of the ten monitoring sites in the MATES II study, Wilmington is the closest site to the Refinery. The cancer risk at the Wilmington site, based on monitoring data, was about 380 per million from stationary and mobile sources. The cancer risk from mobile sources (alone) was about 240 per million. The complete Final Report on the MATES-II Study is available from the SCAQMD (SCAQMD, 2000).

CARB completed air monitoring between May 2001 and July 2002, at Wilmington Park Elementary school because of the location of the school in proximity to refiners and the ports (CARB, 2003). Monitoring was completed for over 50 air pollutants. The key findings of the study were the following: (1) the air quality around the Wilmington Park Elementary school is similar to other parts of the Los Angeles urban area; (2) the estimated cancer risk in Wilmington was 278 per million as compared to Long Beach with a cancer risk of 279 per million and downtown Los Angeles at 341 per million; (3) local meteorology patterns in Wilmington appear to favor dispersion of local air pollution; and (4) PM10 levels measured in Wilmington were noticeably higher than in nearby Long Beach (CARB, 2003).

TABLE 3-4

Ambient Air Quality Toxic Air Contaminants – North Long Beach Maximum Concentration 2004

Pollutant	Annual average	Pollutant	Annual average
VOCs	**ppbv[(1)]**		**ppbv**
Acetaldehyde	3.0	Ethyl Benzene	0.6
Acetone	21	Formaldehyde	5.8
Acetonitrile	1.2	Methyl Bromide	0.09
Acrolein	1.1	Methyl Chloroform	0.09
Acrylonitrile	1.0	Methyl Ethyl Ketone	0.4
Benzene	1.5	Methyl tertiary - Butyl Ether	0.15
1,3 – Butadiene	0.35	Methylene Chloride	0.8
Carbon Disulfide	2.3	Perchloroethylene	0.17
Carbon Tetrachloride	0.16	Styrene	0.6
Chloroform	0.08	Toluene	4.7
o – Dichlorobenzene	0.3	Trichloroethylene	0.06
p – Dichlorobenzene	0.15	meta/para – Xylene	2.5
cis – 1,3 – Dichloropropene	0.05	Ortho – Xylene	0.9
trans – 1,3 – Dichloropropene	0.05		
PAHs	**nanograms/m^3[3(2)]**		**nanograms/m^3**
Benzo(a)pyrene	0.61	Benzo(k)fluoranthene	0.048
Benzo(b)fluoranthene	0.51	Dibenz(a,h)anthracene	0.18
Benzo(g,h,i)perylene	1.7	Indeno(1,2,3-cd)pyrene	0.64
Inorganic compounds*	**nanograms/m^3**		**nanograms/m^3**
Aluminum	2100	Nickel	21
Antimony	10	Phosphorous	61
Barium	91	Potassium	860
Bromine	15	Rubidium	4
Calcium	2300	Selenium	3
Chlorine	6900	Silicon	5600
Chromium	24	Strontium	26
Cobalt	7.5	Sulfur	3100
Copper	59	Tin	10
Hexavalent Chromium	0.11	Titanium	200
Iron	2000	Uranium	2
Lead	18	Vanadium	46
Manganese	40	Yttrium	3
Mercury	4	Zinc	130
Molybdenum	3	Zirconium	14

Source: CARB, 2005a. Annual Toxics Summary by Monitoring Sites, http://www.arb.ca.gov/adam/toxics/sitesubstance.html

Notes: * Data for inorganic compounds is from 2002.
(1) ppbv = parts per billion by volume
(2) nanograms/m3 = nanograms per cubic meter

3.2.4.6 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 3-1. The SCAQMD has established levels of episode criteria and has indicated measures that must be initiated to immediately reduce contaminant emissions when these levels are reached or exceeded. The federal, state, and local air quality regulations are identified below in further detail.

3.2.4.7 Federal Regulations

The U.S. EPA is responsible for setting and enforcing the National Ambient Air Quality Standards for oxidants (ozone), CO, NOx, SO_x, 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. 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 Prevention of Significant Deterioration (PSD) Program and the proposed project may require review to assure compliance with the PSD program for the proposed modifications.

3.2.4.8 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 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. 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 equipment. CARB also sets fuel specifications to reduce vehicular emissions, although it has no direct regulatory approval authority over the proposed project. Federal and state air quality standards are presented in Table 3-1.

California gasoline specifications are governed by both state and federal agencies. During the past decade, 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 which required, among other things, that California phase out the use of MTBE in gasoline.

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 implement the national 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 hazard index greater than 1.0), each facility must, upon approval of the health risk assessment, provide public notification to affected individuals.

3.2.4.9 Local Regulations

The Basin is under the jurisdiction of the SCAQMD which has regulatory authority over stationary source air pollution control and 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. 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, and Rule 1403 - Asbestos Emissions from

Demolition/Renovation Activities), Regulation XX – Regional Clean Air Incentives Market (RECLAIM) Program, and Regulation XXX – Title V Permits.

Asbestos is a toxic air contaminant and regulated under SCAQMD Rule 1403 - Asbestos Emissions from Demolition/Renovation Activities. Rule 1403 requires that the facility conduct a survey of the structures to be removed for the presence of friable asbestos-containing material, notify the SCAQMD of the intent to demolish or renovate the facilities, remove asbestos-containing material before activities begin that would break up, dislodge, or disturb the asbestos-containing material, and establishes procedures for the handling of and control of asbestos-containing material.

3.3 HAZARDS AND HAZARDOUS MATERIALS

3.3.1 TYPES OF ON-SITE HAZARDS

In general, hazard impacts are not a discipline with specific environmental characteristics that can be easily described or quantified. Instead, hazard incidents consist of random, unexpected accidental occurrences that may create adverse effects on human health or the environment.

This section describes features of the existing environment as they relate to the risk of a major accident occurring at the BP Carson Refinery. Factors which are taken into consideration to determine the magnitude of an upset event are as follows:

- The probability of an event occurring;
- The consequences of an event (exposures);
- The types of materials potentially involved in an upset event; and
- The location of sensitive receptors e.g. residences, schools, and businesses.

Typical hazards at a refinery include toxic gas clouds, fires, vapor cloud explosions, thermal radiation, and overpressure. These hazards are described below.

Toxic gas clouds: Toxic gas clouds are releases of volatile chemicals (e.g., anhydrous ammonia and hydrogen sulfide) that could form a cloud and migrate off-site, thus, creating adverse health impacts to any exposed individuals. "Worst-case" conditions tend to arise when very low wind speeds coincide with accidental release, which can allow the chemicals to accumulate rather than disperse.

Torch fires (gas and liquefied gas releases), flash fires (liquefied gas releases), pool fires, and vapor cloud explosions (gas and liquefied gas releases): The rupture of a storage tank or vessels containing a flammable gaseous material (like propane), without immediate ignition, can result in a vapor cloud explosion. The "worst-case" upset occurs

when a release occurs and produces a large aerosol cloud with flammable properties. If the flammable cloud does not ignite after dispersion, the cloud would simply dissipate. If the flammable cloud were to ignite during the release, a flash fire or vapor cloud explosion could occur. If the flammable cloud were to ignite immediately upon release, a torch fire would ensue.

Thermal Radiation: Thermal radiation is the heat generated by a fire and the potential impacts associated with exposure. 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.

Explosion/Overpressure: Process vessels containing flammable explosive vapors and potential ignition sources are present at refineries. Explosions may occur if the flammable/explosive vapors came into contact with an ignition source. An explosion could cause impacts to individuals and structures in the area due to overpressure.

Based on a review of the existing BP Carson Refinery operations and processes, the greatest potential for an upset condition to occur that would affect the public would result from the ignition of flammable material. The most likely flammable materials to have an offsite impact would be butane and pentane, which are flammable liquids stored in large quantity at the BP Carson Refinery. Both radiant heat and blast overpressures could result from ignition of a butane or pentane release. Other events that could have offsite impacts are the release and ignition of pentane from a pipeline rupture or a hydrogen sulfide release. These types of events are the most likely to occur in an industrial environment such as a refinery and establish the environmental setting.

BP currently adheres to the following safety design and process standards:

- The California Health and Safety Code Fire Protection specifications.

- The design standards for petroleum refinery equipment established by American Petroleum Institute, American Society of Mechanical Engineers, the American Institute of Chemical Engineers, the American National Standards Institute, and the American Society of Testing and Materials.

- The applicable California Occupational Safety and Health Act (CalOSHA) requirements.

BP maintains its own emergency response capabilities, including onsite equipment and trained emergency response personnel who are available to respond to emergency situations anywhere within BP Carson Refinery.

BP Carson Refinery also has prepared a Risk Management Program (RMP) for the hazardous materials, butane, pentane and ammonia that are currently used. The City of Carson Fire Department administers this program. In addition, operators of the BP

Carson Refinery prepared an Emergency Response Manual. This manual describes the emergency response procedures that would be followed in the event of any of several release scenarios and the responsibilities for key response personnel. The scenarios include the release of the following:

- Ammonia stored in bulk tanks.
- Hydrogen sulfide that is a component of a number of intermediate Refinery streams.
- Natural gas or refinery fuel gas used throughout the Refinery involving both ignited and unignited vapors.
- Propane or butane leaks involving both ignited and unignited vapors.
- Constituents of the petroleum tanks that are located throughout the Refinery.

Modifications under the RMP and the California Accidental Release Program (CalARP) are required for covered processes if changes to usage or the process can reasonably be expected to produce a change by a factor of two in the distance to the endpoint for the off-site consequences analysis. Modifications are also required if there is a major change to the process requiring a new process hazard analysis.

3.3.2 TRANSPORTATION RISKS

Regulations for the transport of hazardous materials by public highway are described in 49 CFR 173 and 177. Although the transport of hazardous materials is regulated for safety by the U.S. Department of Transportation, there is a possibility that a tanker truck could be involved in an accident spilling its contents. 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 probable risk of an accident is the number of accidents per million miles traveled. Complicating the assessment of probable risk is the fact that some accidents can cause significant damage without injury or fatality.

Every time hazardous materials are moved from the site of generation, opportunities are provided for accidental (unintentional) release. A study conducted by the U.S. EPA indicates that the expected number of hazardous materials spills per mile shipped ranges from one in 100 million to one in one million, depending on the type of road and transport vehicle used. The U.S. EPA analyzed accident and traffic volume data from New Jersey, California, and Texas, using the Resource Conservation and Recovery Act Risk/Cost Analysis Model and calculated the accident involvement rates presented in Table 3-5. The study concluded that the release rate for tank trucks is much lower than

for any other container type (Los Angeles County, 1988). The data in Table 3-5 are for all types of trucks.

TABLE 3-5

Truck Accident Rates for Cargo on Highways

Highway Type	Accidents Per 1,000,000 miles
Interstate	0.13
U.S. and State Highways	0.45
Urban Roadways	0.73
Composite*	0.28

* Average number for transport on interstates, highways, and urban roadways.

3.3.3 REGULATORY BACKGROUND

There are many federal and state rules and regulations that refineries and petroleum storage facilities must comply with which serve to minimize the potential impacts associated with hazards at these facilities. The most important and relevant regulations relative to hazards are summarized in the following paragraphs.

Under the Occupational Safety and Health Administration (OSHA) regulations [29 Code of Federal Regulations (CFR) Part 1910], facilities which use, store, manufacture, handle, process, or move highly hazardous materials must prepare a fire prevention plan. In addition, 29 CFR Part 1910.119, Process Safety Management (PSM) of Highly Hazardous Chemicals, and Title 8 of the California Code of Regulations, General Industry Safety Order §5189, specify required prevention program elements to protect workers at facilities that handle toxic, flammable, reactive or explosive materials. Prevention program elements are aimed at preventing or minimizing the consequences of catastrophic releases of the chemicals and include process hazard analyses, formal training programs for employees and contractors, investigation of equipment mechanical integrity, and an emergency response plan.

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, U.S. EPA regulations are set forth in 40 CFR Part 68. In California, the California Accidental Release Prevention (CalARP) Program regulation (CCR Title 19, Division 2, Chapter 4.5) was issued by the Governor's Office of Emergency Services (OES). RMPs consist of three main elements: a hazard assessment that includes off-site consequences analyses and a five-year accident history, a prevention program, and an emergency response program. RMPs for existing facilities were required to be submitted by June 21, 1999. BP has complied with the RMP requirements and has submitted the appropriate reports. The Carson City Fire Department administers the CalARP program

for the Refinery. The Refinery is also required to comply with the U.S. EPA's Emergency Planning and Community Right-to-Know Act (EPCRA), which requires annual reporting of releases from the Refinery and specific requirements in the event of an emergency release.

All Refinery facilities are required to have a Spill Prevention Containment and Countermeasures (SPCC) Plan per the requirements of 40 Code of Federal Regulations, Section 112. The SPCC is designed to prevent spills from on-site facilities and includes requirements for secondary containment, provides emergency response procedures, establishes training requirements, and so forth. Additional spill 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.

The Hazardous Materials Transportation (HMT) Act is the federal legislation that regulates transportation of hazardous materials. The primary regulatory authorities are the U.S. Department of Transportation, the Federal Highway Administration, and the Federal Railroad Administration. The HMT Act requires that carriers report accidental releases of hazardous materials to the Department of Transportation at the earliest practical moment (49 CFR Subchapter C). Incidents which must be reported involve deaths, injuries requiring hospitalization, and property damage exceeding $50,000. The California Department of Transportation (Caltrans) sets standards for trucks in California. The regulations are enforced by the California Highway Patrol.

California Assembly Bill 2185 requires local agencies to regulate the storage and handling of hazardous materials and requires development of a plan to mitigate the release of hazardous materials. Businesses that handle any of the specified hazardous materials must submit to government agencies (i.e., fire departments), an inventory of the hazardous materials, an emergency response plan, and an employee training program. The business plans must provide a description of the types of hazardous materials/waste on-site and the location of these materials. The information in the business plan can then be used in the event of an emergency to determine the appropriate response action, the need for public notification, and the need for evacuation.

3.4 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 3-1.

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.

The sound pressure level is measured on a logarithmic scale with the 0 dBA level based on the lowest detectable sound pressure level that people can perceive. Decibels cannot be added arithmetically, but rather are added on a logarithmic basis. A doubling of sound energy is equivalent to an increase of three dBA. 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-two dBA changes are generally not perceived (City of Los Angeles, 1998).

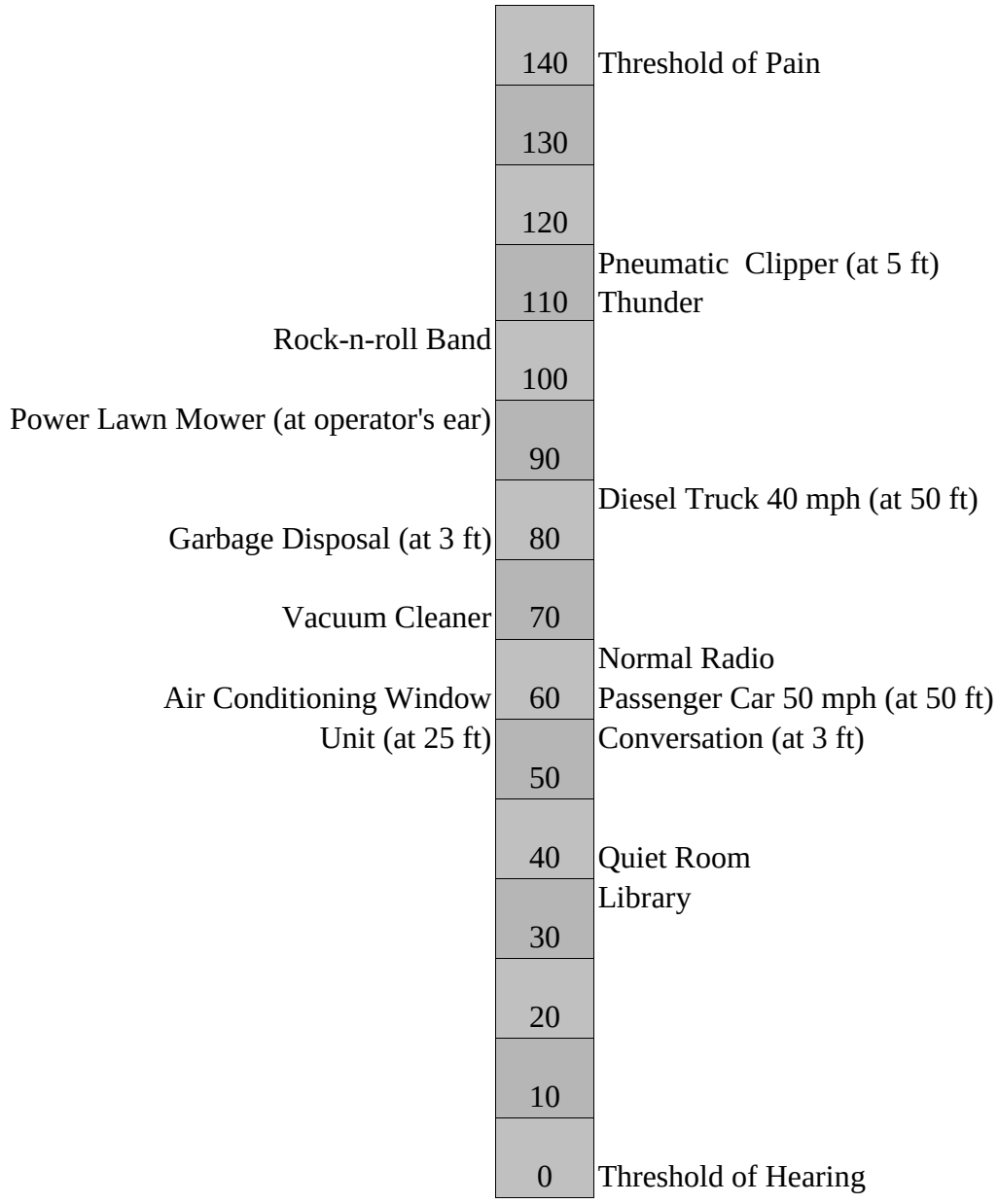
3.4.1 REFINERY EXISTING NOISE LEVELS

The vicinity of the proposed Refinery project is an urban environment characterized by extensive industrial, commercial, transportation-related and some residential land uses. The ambient noise environment in the project vicinity is composed of the contributions from equipment and operations within these commercial and industrial areas, from rail activities, from the 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 site 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 and locomotive engines and trains using the railroad tracks are a source of noise in the area.

FIGURE 3-1

GENERAL NOISE SOURCES AND THEIR SOUND PRESSURE LEVELS



Sources: Industrial Noise Manual, 3rd Edition, AIHA, 1975; City of Long Beach, 1975

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Although there are numerous sources of noise in the area, there are few sensitive receptors (i.e., residential areas, hospitals, rest homes, and schools). The closest noise sensitive receptors to the proposed project locations within the Refinery are two residential areas:

- at the southwest corner of the of the Refinery (south of Sepulveda Boulevard and east of Bonita Avenue)
- approximately 0.5 mile northwest of the Refinery along Lucerne Street and 223rd Street.

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 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 the Refinery. The major noise sources within the Refinery are associated with the main processing units. Previous noise studies and noise measurements were performed in the Refinery area in 1984 and 1992 (SCAQMD, 1993) in support of the ARCO Watson Refinery Modernization Project EIR, and ARCO Clean Fuels Projects EIR, respectively. Existing ambient sound levels were evaluated in support of the Refinery's Polypropylene project in 1997 (SCAQMD, 1997). The noise monitoring locations are summarized in Table 3-6.

TABLE 3-6

Noise Monitoring Locations

LOCATION	DESCRIPTION
1	Approximately 470 feet west of Lucerne Street and 22 feet north of 223rd Street. This location represents a residential area.
2	Commercial land use at the corner of 223rd Street and Wilmington Avenue. Approximately 350 feet south of 223rd Street and about 73 feet west of Wilmington Avenue. The Refinery is east, I-405 is north, and south and west are commercial land uses.
3	Open commercial land approximately 37 feet south of Watson Center Road and 68 feet west of Wilmington Avenue. Immediately east of Wilmington Avenue and the BP Carson Refinery
4	Corner of Sepulveda Boulevard and Bonita Avenue, located approximately 75 feet south of Sepulveda Boulevard and 68 feet east of Bonita Avenue. This location represents a residential area.
5	Industrial/commercial land use approximately 17 feet east of Alameda Street and 293 feet north of the San Diego offramp. West and east of this site are railroad yards and industrial areas, respectively.

TABLE 3-6 (concluded)

Noise Monitoring Locations

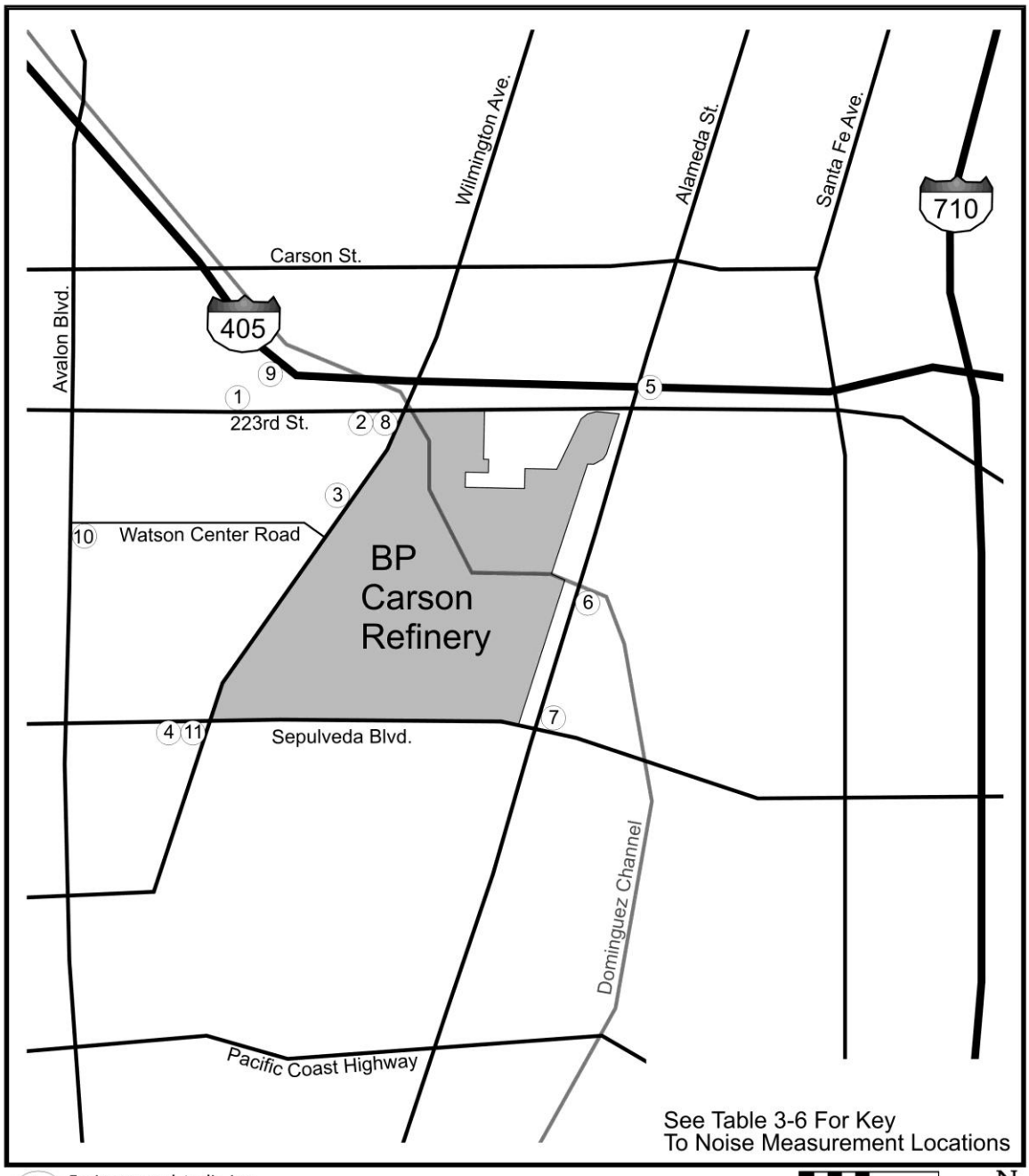
LOCATION	DESCRIPTION
6	Industrial/commercial land use approximately 21 feet east of Alameda Street and 20 feet south of the Dominguez Channel. The BP Carson Refinery and Shell Refinery are west and east, respectively.
7	Approximately six feet east of Alameda Street and 600 feet north of Sepulveda Boulevard within an industrial/commercial land use. West is the BP Carson Refinery.
8	Commercial land use at the corner of 223rd Street and Wilmington Avenue. Approximately 60 feet west of Wilmington Avenue
9	West side of Lucerne Avenue between Renton Street and 222nd Street.
10	Southeast corner of Watson Center Road and Avalon Boulevard.
11	Southwest corner of Wilmington Avenue and Sepulveda Boulevard. This location represents a residential area.

Source: SCAQMD 1997 and 2005.

Measurements at locations 8-11 were made during the morning, afternoon, evening and night. Measurements at locations 1-4 were made during the daytime peak hour, evening and nighttime. Only daytime peak hour traffic noise was measured at locations 5, 6, and 7. The locations of these measurements described in Table 3-6 are shown in Figure 3-2.

The results of the ambient noise measurements are presented in Table 3-7. Locations 8 and 2 represent the noise environment northwest of the Refinery where commercial land uses are located. Noise from mechanical equipment and process at the Refinery dominate the local noise environment. The noise levels do not change significantly throughout the day. The community noise exposure level (CNEL) (74 and 75) are in the high range for "conditionally acceptable" land use compatibility guidelines (see Table 3-8). 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 (see Table 3-8). Location 1 is influenced by traffic noise on 223rd Street and the major noise source at this location is traffic. The noise from the Refinery was not audible during the measurement periods and is not a significant contributing factor (less than 45 dBA).

Locations 4 and 11 are southwest of the Refinery at the north edge of a residential community. The contribution to the local noise environment from the Refinery is estimated to be less than 44 dBA. Traffic noise from Sepulveda Boulevard is the major noise source at these locations and the area would be considered "normally acceptable" for residential land uses.



BACKGROUND AMBIENT NOISE LEVEL
MEASUREMENT LOCATIONS
BP CARSON REFINERY

Project No. 2393

Figure 3-2

N:\2393\Background Ambient Noise.cdr

TABLE 3-7

Results of Noise Monitoring
(All Measurements in dBA)

Location	Morning	Afternoon	Evening	Nighttime	CNEL
1	--	71	69	57	71
2	--	67	68	68	75
3	--	67	64	65	72
4	--	62	61	56	64
5	--	--	69	--	--
6	--	73	--	--	--
7	--	74	--	--	--
8	67	67	67	67	74
9	61	62	61	55	63
10	61	60	47	48	59
11	66	65	61	53	64

Source: SCAQMD, 1997 and 2005

The existing CNEL noise environment in the vicinity of the closest industrial and commercial receptors to the west and northwest of the Refinery is 71 to 74 dBA, (SCAQMD, 2005), which, as shown in Table 3-8, is in the "conditionally acceptable" range for such land use categories.

3.4.2 REGULATORY BACKGROUND

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 5 dBA is 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 is 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.

The Refinery is located within the City of Carson. 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.

TABLE 3-8
Land Use Compatibility for Community Noise Environments

Land Use Category	Community Noise Exposure			
	Ldn or CNEL[1], dB			
	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
Transient Lodging-Motel, Hotels	50-65	65-70	70-80	80-85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-60	60-65	65-80	80-85
Auditoriums, Concert Halls, Amphitheaters	NA	50-65	NA	65-85
Sports Arenas, Outdoor Spectator 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

Source: City of Carson; modified from U.S. Department of Housing and Urban Development Guidelines and State of California Standards.

NOTES:

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 or development should generally not be undertaken.

[1] L_{dn} is an average A-weighted noise level during a 24-hour day with 10 dBA added to levels measured between 10 pm and 7 am. CNEL is similar to L_{dn} except that CNEL also adds 5 dBA to levels between 7 pm and 10 pm

KEY: NA= Not Applicable

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 3-9. No areas near the Refinery are designated Zone 1. For residential and commercial areas, nighttime (10 p.m. to 7 a.m.) limits are 5 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 3-9

City of Carson Noise Ordinance Limits

	Construction Limit (dBA)	Operations Limit (exterior dBA except where noted)				
Residential: L_{max}=65 (7 a.m. -6 p.m.)	Residential[ab]	L_{50}=50	L_{25}=55	$L_{8.3}$=60	$L_{1.7}$=65	L_{max}=70
	Commercial[ab]	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.

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 TRANSPORTATION/TRAFFIC

3.5.1 REGIONAL CIRCULATION

The Refinery is located at 1801 East Sepulveda Boulevard in the City of Carson. Four major freeways bound the 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). The Long Beach Freeway (Interstate 710) and the Harbor Freeway (Interstate 110) are major north and south highways, which extend from

the Ports of Los Angeles and Long Beach through Los Angeles County. The San Diego Freeway (Interstate 405), less than one-quarter of a mile north of the project site, runs diagonally through the region. The Gardena Freeway (Route 91) lies further to the north of the site and runs east/west. Sepulveda Boulevard, Wilmington Avenue, 223rd Street, and Alameda Street are key arterials servicing the area. 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 into/out of the port areas.

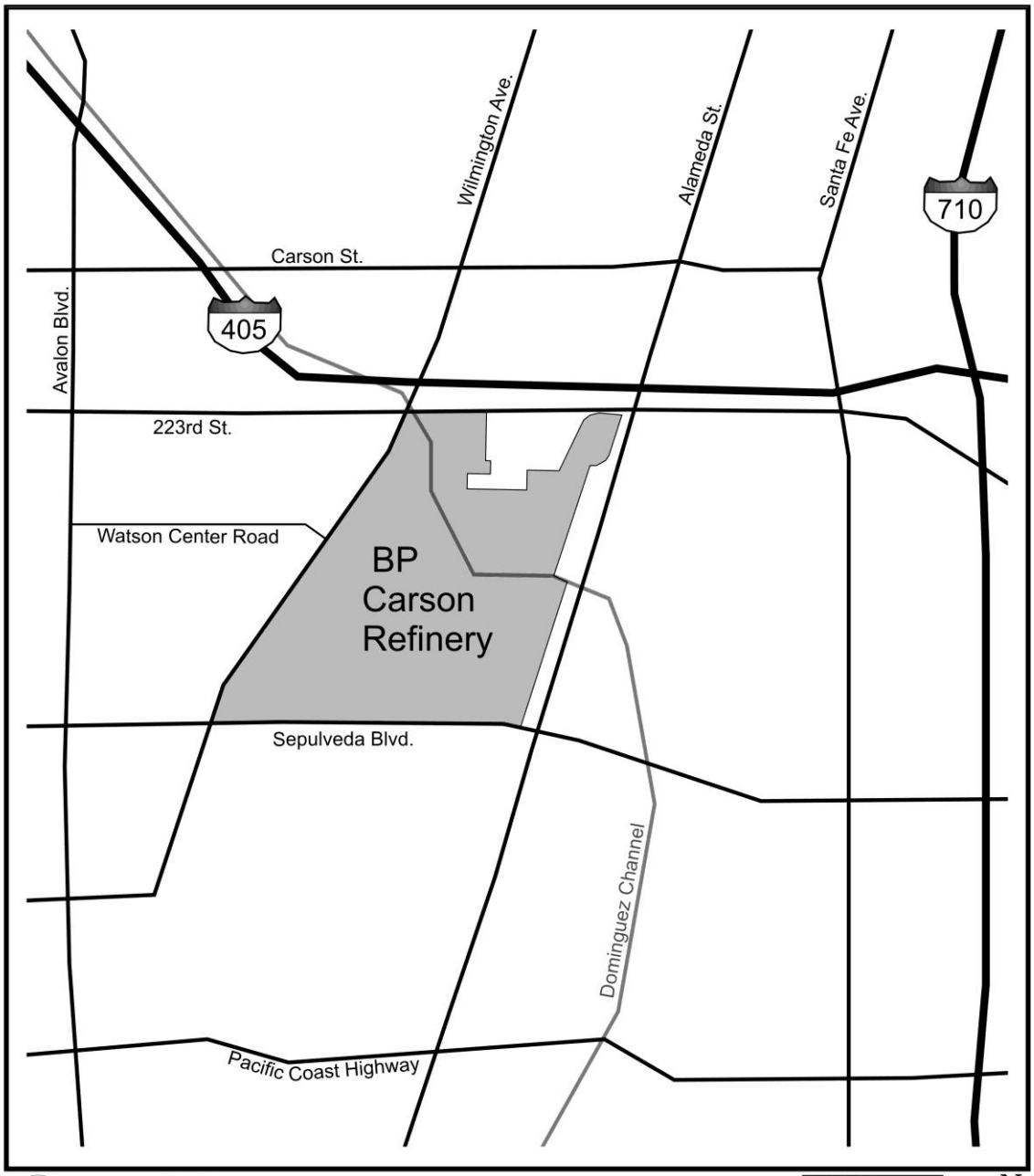
In addition to the freeway system, railroad facilities service the Refinery providing an alternative mode of transportation for the distribution of goods and materials. The area is served by the Southern Pacific, Union Pacific, and Santa Fe, Pacific Electric and Harbor Belt Line railroads, with several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

3.5.2 LOCAL CIRCULATION

The Refinery is approximately one mile west of the Long Beach Interstate 710 Freeway and approximately two and one half miles east of the Harbor Interstate 110 Freeway. 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 3-3). Construction traffic generated by the proposed project will access the site via Gate 60 located on 223rd Street.

Wilmington Avenue and Alameda Street are north/south four-lane divided roadways and both are considered to be major highways by the City of Carson Transportation and Infrastructure Element of the General Plan (City of Carson, 2004). Sepulveda Boulevard and 223rd Street are east/west four-lane divided roadways in the project vicinity and both are considered to be major highways by the City of Carson (City of Carson, 2004). Major highways function to connect traffic from collector streets to the major freeway systems as well as to provide access to adjacent land uses. Major highways move large volumes of automobiles, trucks and buses, and link principal elements within the City to other adjacent regions. These facilities typically handle inter-city vehicle trips in the magnitude of 25,000 or more vehicles per day (City of Carson, 2004).

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).



LOCAL TRANSPORTATION SYSTEM
BP CARSON REFINERY

Project No. 2393

Figure 3-3

N:\2393\Local Transportation System (rev.1).cdr

3.5.3 EXISTING TRAFFIC CONDITIONS

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 (see Table 3-8). 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 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 to C.

3.5.4 REGULATORY BACKGROUND

The Congestion Management Program (CMP) was created statewide and has been implemented locally by the MTA. The City of Carson has established specific objectives and goals for traffic within the City (City of Carson, 2004). It is the City's objective that the traffic LOS on the street system in the community not exceed LOS D. Most of the City's major street intersections and the intersections near the Refinery are in compliance with this policy.

A traffic analysis was conducted for a project at the BP Refinery in May 2005 (SCAQMD, 2005). The existing traffic conditions are based on the traffic analysis completed for the BP Refinery in May 2005, assuming an ambient traffic growth of 0.25 percent per year annual traffic growth rate (i.e., the traffic counts were increased 0.25 percent per year) and no changes in existing intersection configurations. Volume to capacity ratios and level of service analysis are presented in Table 3-10. Detailed traffic data are included in Appendix D.

New projects within the City must comply with the CMP for Los Angeles County. The CMP involves monitoring traffic conditions on the designated transportation network, performance measures to evaluate current and future system performance, promotion of alternative transportation methods, analysis of the impact of land use decisions on the transportation network, and mitigation to reduce impacts on the network. The CMP requires traffic studies to analyze CMP monitoring locations where the proposed project adds 150 or more during AM or PM peak hours on a permanent basis.

TABLE 3-10

Refinery Safety, Compliance, and Optimization Project
Existing Level of Service Analysis
and Volume-to-Capacity-Ratios

INTERSECTION	2005		2008 Forecast	
	P.M LOS	Peak Hour V/C	P.M. LOS	Peak Hour V/C
Wilmington Ave. & I-405 NB on/off ramps	B	0.698	C	0.703
Wilmington Ave. & I-405 SB on/off ramps	B	0.606	B	0.609
Wilmington Ave. & 223rd St.	D	0.835	D	0.841
Wilmington Ave. & Watson Center	B	0.664	B	0.668
Wilmington Ave. & Sepulveda Blvd.	D	0.896	E	0.902
Alameda Street & I-405 NB ramp	A	0.535	A	0.538
Alameda St. & 223rd St./Wardlow Access	A	0.406	A	0.409
Alameda St. & Sepulveda Blvd.	D	0.841	D	0.846
I-405 SB on/off ramps & 223rd St./Wardlow	A	0.507	A	0.510
223rd St. & Alameda St./Wardlow Access	D	0.840	D	0.845
BP Refinery Gate 16 & 223rd St.	C	0.746	C	0.751
BP Refinery Gate 60 & 223rd St.	B	0.647	B	0.651

Notes: (1) Existing traffic data increased by 0.25 percent per year to estimate the traffic conditions in 2008 without the proposed project. Growth rate was projected from the City of Carson General Plan (Carson, 2004).
V/C = Volume to capacity ratio (capacity utilization ratio)
LOS = Level of Service

The City of Carson must remain in compliance with applicable federal, state and regional regulations, and coordinate with neighboring jurisdictions in order to enhance eligibility for all potential transportation improvement program funding. The policies that the City has established to ensure compliance include: (1) actively participate in various intergovernmental committees and related planning forums associated with county, regional, and state CMPs; (2) ensure that the City remains in compliance with the county, regional and state CMPs through the development of appropriate City programs and traffic impact analysis of new projects impacting the CMP routes; (3) ensure that new roadway links are constructed as designated in the Circulation Element, and link with existing roadways in neighboring jurisdictions in order to allow efficient access into and out of the City; (4) assess adjacent local agencies' plans to ensure compatibility across jurisdictional boundaries; and (5) encourage cooperation with other governmental agencies to provide adequate vehicular traffic movements on streets and through intersections by means of synchronized signalization (City of Carson, 2004).

Freeways are controlled access, high-speed roadways with grade-separated interchanges intended to expedite movement between distant areas in the region. Planning, design,

construction and maintenance of freeways in California are the responsibility of the California Department of Transportation (CalTrans).

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