CHAPTER 3

ENVIRONMENTAL SETTING

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Air Quality
Hazards and Hazardous Materials
Hydrology and Water Quality
Noise
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3.0 ENVIRONMENTAL SETTING

3.1 INTRODUCTION

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

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

3.2 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

3.2.1 METEOROLOGICAL CONDITIONS

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

3.2.2 TEMPERATURE AND RAINFALL

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

downtown Los Angeles received 20.19 inches of rainfall. Since then, annual rainfall totals have dipped to 8.70 (2012), 5.93 2013), 6.04 (2014) inches. The city has received 8.46 (2015) inches to date, with the water year ending September 30 each year (NWS, 2015).

3.2.3 WIND FLOW PATTERNS

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

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

3.2.4 EXISTING AIR QUALITY

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

3.2.4.1 Criteria Pollutants

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

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

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

TABLE 3.2-1

Ambient Air Quality Standards

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

Footnotes:

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

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

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

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

3.2.4.2 Regional Air Quality

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

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

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

TABLE 3.2-2

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

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

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

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

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

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

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

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

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

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

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

3.2.4.3 Local Air Quality

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

TABLE 3.2-3

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

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

TABLE 3.2-3 (concluded)

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

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

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

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

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

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

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

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

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

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

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

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

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

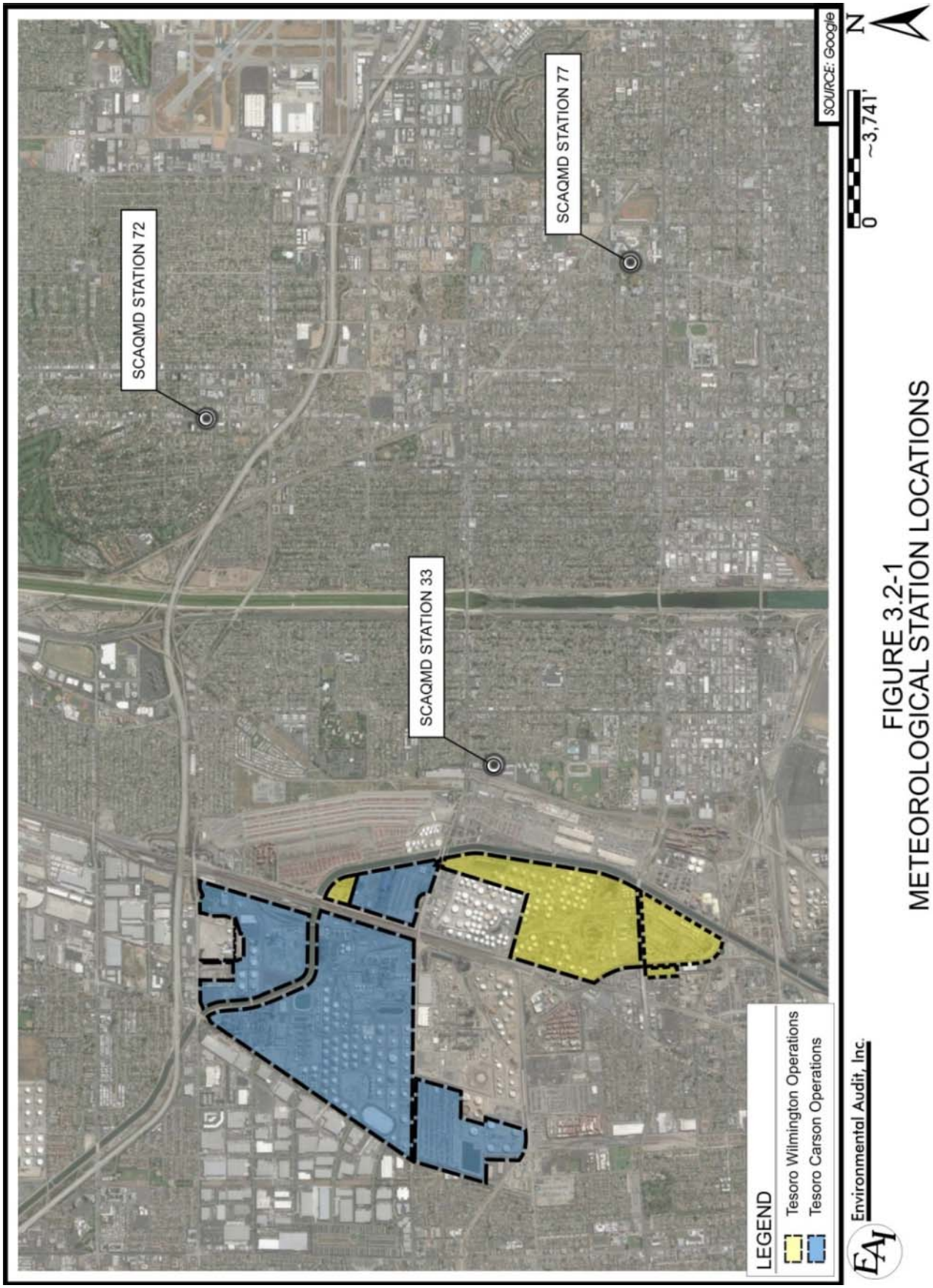


FIGURE 3.2-1
METEOROLOGICAL STATION LOCATIONS
TESORO LOS ANGELES REFINERY

3.2.4.4 Tesoro Los Angeles Refinery Criteria Pollutant Emissions

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

TABLE 3.2-4

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

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

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

The Refinery is regulated under the Regional Clean Air Incentives Market (RECLAIM) Program for NOx and SOx. The Refinery has been in the RECLAIM program since its inception in January 1994 and receives an annual allocation of RECLAIM trading credits (RTCs), which has and will continue to decline over time. Annually, the Refinery must relinquish NOx and SOx RTCs equal to the annual emissions from the Refinery. When the allocation is insufficient to

cover the required emissions, as is the case today, RTCs are purchased from the RTC credit market.

3.2.4.5 Toxic Air Contaminants

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

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

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

The 2012-2013 Basin average population-weighted risk summed for all the toxic components yielded a cancer risk of 367 in one million, as compared to the MATES III Basin average risk of 853 per million when using the same risk assessment methodology from OEHHA. This means that 367 people out of one million are susceptible to contracting cancer from exposure to the known TACs over a 70-year period of time. Thus, the modeled risk decreased by 57 percent, primarily attributed to the changes in diesel emissions between 2005 and 2012. OEHHA recently updated its risk assessment methodology, primarily to take into account recent scientific findings regarding children's increased susceptibility to contracting cancer from environmental exposures. This methodology change causes a roughly two to threefold increase in risk given the same level of exposure. For the MATES IV study, the population-weighted risk increases to 897 in one million using this new methodology. Diesel particulate continues to be responsible for the largest contribution to cancer risk from air toxics. The next three highest contributors include benzene, hexavalent chromium, and 1,3-butadiene (SCAQMD, 2015a).

TABLE 3.2-5

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

Pollutant	Peak 24-hour Concentration	Pollutant	Peak 24-hour Concentration
VOCs	**ppbv**		**ppbv**
Acetaldehyde	2.79	Formaldehyde	4.06
Acetone	9.93	Methyl Ethyl Ketone	0.47
Benzene	1.17	Methylene Chloride	13.59
1,3-Butadiene	0.32	Perchloroethylene	0.07
Carbon Tetrachloride	0.11	Styrene	0.32
Chloroform	0.06	Toluene	3.58
1,4-Dichlorobenzene	0.02	Trichloroethylene	0.07
1,2-Dichloroethane	0.05	Meta/para-Xylene	2.53
Ethyl Benzene	0.73	ortho-Xylene	0.86
Inorganic compounds	**nanograms/m^3**		**nanograms/m^3**
Antimony	11.40	Manganese	61.70
Arsenic	1.46	Molybdenum	7.35
Barium	159.00	Nickel	13.00
Beryllium	0.09	Potassium	1,920
Cadmium	0.42	Rubidium	4.48
Calcium	4,640	Selenium	5.19
Cesium	0.23	Strontium	56.00
Chromium	8.83	Tin	8.63
Cobalt	3.70	Titanium	324.00
Copper	251.00	Uranium	0.29
Hexavalent Chromium	3.70	Vanadium	18.00
Iron	5,730	Zinc	225.00
Lead	43.30		

Source: SCAQMD, 2015a. MATES-IV Final Report, May 2015
Notes: ppbv = parts per billion by volume; nanograms/m3 = nanograms per cubic meter

3.2.4.6 Climate Change

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

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

keep global mean warming below two degrees Celsius, which is assumed to be necessary to avoid additional climate change.

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

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

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

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

3.2.5 REGULATORY BACKGROUND

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

3.2.5.1 Federal Regulations

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

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

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

TABLE 3.2-6
2008 GHG Emissions for the Basin

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

Source: (SCAQMD, 2013a)

(a) MMT = million metric tons.

(b) Waste Disposal includes sewage treatment, landfills, incineration, and other waste disposal.

(c) Cleaning and Surface Coatings includes laundering, degreasing, coatings and related processes, printing, adhesives and sealants, and other cleaning and surface coatings.

(d) Industrial Processes include chemical, food and agriculture, mineral processes, metal processes, wood and paper, glass and related products, electronic, and other industrial processes.

(e) Solvent Evaporation includes consumer products, architectural coating and related solvents, pesticides and fertilizers, and asphalt paving and roofing.

(f) Miscellaneous Processes include residential fuel combustion, farming operations, construction and demolition, paved road dust, unpaved road dust, fugitive windblown dust, fires, waste burning and disposal, utility equipment, cooking, and other miscellaneous processes.

(g) On-Road Motor Vehicles include trucks (all sizes), motorcycles, buses (all types), and motorhomes.

(h) Other Mobile Sources include aircraft; trains; ships; commercial boats, construction, airport, and oil and gas drilling equipment.

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

3.2.5.2 California Regulations

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

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

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

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

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

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

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

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

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

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

3.2.5.3 Local Regulations

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

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

3.3 HAZARDS AND HAZARDOUS MATERIALS

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

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

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

3.3.1 TYPES OF ON-SITE HAZARDS

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

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

The potential hazards associated with industrial activities are a function of the materials being processed, processing systems, and procedures used to operate and maintain the facility. The

hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and their process conditions, and can include the following events:

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

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

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

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

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

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

3.3.2 HAZARDS MODELING METHODOLOGY

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

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

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

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

3.3.3 TRANSPORTATION RISKS

3.3.3.1 Truck Transport

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

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

TABLE 3.3-1

Summary of Existing Hazards[a]

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

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

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

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

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

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

3.3.3.2 Rail Transportation

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

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

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

TABLE 3.3-2

Summary of National and California Train Accident Data

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

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

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

3.3.4 PIPELINE RISKS

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

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

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

TABLE 3.3-3

California Hazardous Liquid Onshore Pipeline Incidents (2004 – 2013)

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

Source: PHMSA, 2014.

3.3.5 EXISTING SOIL AND GROUNDWATER CONTAMINATION

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

3.3.5.1 Existing Soil Contamination

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

3.3.5.2 Existing Groundwater Contamination

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

TABLE 3.3-4

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

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

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

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

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

3.3.6 EXISTING REFINERY SAFETY SYSTEMS

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

3.3.6.1 Existing Fire-Fighting Capabilities

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

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

The Wilmington Operations operate an Emergency Response Team (ERT), which has 50 Refinery employees trained in rescue, heavy equipment apparatus operations (i.e., response equipment such as fire trucks, trailer mounted pumps, etc.), and hazmat response. There is a

minimum of six ERT members per shift plus four supervisors. Training for ERT employees is conducted monthly and includes live fire and medical drills.

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

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

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

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

3.3.6.2 Deluge and Foam Systems

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

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

3.3.6.3 Fire Fighting Support Vehicles and Equipment

The Carson Operations have two foam pumping fire engines, one foam pumping truck, six truck-mounted quick attack foam pumping trucks and one ladder truck. The Wilmington Operations have three foam pumpers, four quick attack trucks that supply foam, and two foam tenders. In

addition, there are numerous wheeled and portable fire extinguishers throughout the Tesoro Los Angeles Refinery.

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

3.3.6.4 Spill Response

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

3.3.7 REGULATORY BACKGROUND

3.3.7.1 Federal Regulations

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

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

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

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

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

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

3.3.7.1.4 Hazardous Materials and Waste Regulations

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

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

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

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

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

3.3.7.1.5 Oil Storage and Pipeline Regulations

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

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

U.S. Department of Transportation, Office of Pipeline Safety: The Office of Pipeline Safety, within the U.S. DOT, PHMSA, has jurisdictional responsibility for ensuring the safe and secure movement of hazardous liquid and gas through pipelines under its jurisdiction in the United States. Title 49 of the U.S.C. relates to the role of transportation, including pipelines, in the United States. 49 CFR Parts 190-199 establish minimum pipeline safety standards. The Office

of the State Fire Marshal works in partnership with the Federal Pipeline and Hazardous Materials Safety Administration to assure pipeline operators are meeting requirements for safe, reliable, and environmentally sound operation of their facilities for intrastate pipelines within California.

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

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

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

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

3.3.7.1.6 Other Federal Regulations

Chemical Facility Anti-Terrorism Standards: The Chemical Facility Anti-terrorism Standards are a set of U.S. Government security regulations for high-risk chemical facilities such

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

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

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

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

3.3.7.2 State Regulations

3.3.7.2.1 Hazardous Materials and Waste Regulations

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

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

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

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

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

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

California Accident Release Prevention (CalARP) Program: The CalARP Program (19 CCR Division 2, Chapter 4.5) requires the preparation of Risk Management Plans (RMPs). RMPs are documents prepared by the owner or operator of a stationary source and contain detailed information including: (1) regulated substances held on-site at the stationary source; (2) off-site consequences of an accidental release of a regulated substance; (3) the accident history at the stationary source; (4) the emergency response program for the stationary source; (5) coordination with local emergency responders; (6) hazard review or process hazard analysis; (7) operating procedures at the stationary source; (8) training of the stationary source's personnel; (9)

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

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

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

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

3.3.7.2.2 Oil Production and Pipeline Regulations and Oversight

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

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

3.3.7.3 Local Regulations

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

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

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

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

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

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

3.4 HYDROLOGY AND WATER QUALITY

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

3.4.1 REFINERY WATER USE AND WASTEWATER GENERATION

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

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

3.4.2 EXISTING REFINERY WATER USE AND WASTEWATER GENERATION

3.4.2.1 Refinery Well Water Supply

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

3.4.2.2 Carson Operations

3.4.2.2.1 Water Use

The Carson Operations obtains its water from a combination of sources including: 1) purchased potable water from the California Water Service via various well sources; 2) non-potable service

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

TABLE 3.4-1

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

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

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

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

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

3.4.2.2.2 Wastewater Generation

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

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

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

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

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

3.4.2.2.3 Surface Water Runoff

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

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

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

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

3.4.2.3 Wilmington Operations

3.4.2.3.1 Water Use

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

In 2012, the Wilmington Operations used about 2,081 million gallons of water which was used in many of the refining support processes. Of this amount, approximately 577 million gallons were potable water, and 1,504 million gallons were from Wilmington Operations owned wells. In 2013, the Wilmington Operations used about 1,917 million gallons of water. Of this amount, approximately 912 million gallons were potable water and 1,005 million gallons came from Wilmington Operations owned wells. The Wilmington Operations is not connected to any

pipelines supplying recycled water, so it does not use recycled water in any units or processes. The summary of water use at the Wilmington Operations is provided in Table 3.4-1.

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

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

3.4.2.3.2 Wastewater Generation

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

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

3.4.2.3.3 Surface Water Runoff

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

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

3.4.3 REGULATORY BACKGROUND

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

3.4.3.1 Federal

3.4.3.1.1 Clean Water Act

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

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

Section 311 of the Clean Water Act addresses oil spill prevention. The Oil Pollution Prevention regulation sets forth requirements for prevention of, preparedness for, and response to oil discharges at specific non-transportation-related facilities. To prevent oil from reaching

navigable waters and adjoining shorelines, and to contain discharges of oil, the regulation requires regulated facilities to develop and implement SPCC Plans and establishes procedures, methods, and equipment requirements. In 1990, the Oil Pollution Act amended the Clean Water Act to require some oil storage facilities to prepare Facility Response Plans. On July 1, 1994, U.S EPA finalized the revisions that direct facility owners or operators to prepare and submit plans for responding to a worst-case discharge of oil.

3.4.3.1.2 State of California Storm Water Pollution Prevention Plan

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

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

- Eliminate or reduce non-stormwater discharges to stormwater sewer systems and other waters of the nation;

- Develop and implement a Stormwater Pollution Prevention Plan emphasizing stormwater "Best Management Practices;" and,

- Perform inspections of stormwater pollution prevention measures to assess their effectiveness.

3.4.3.1.3 Safe Drinking Water Act

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

3.4.3.2 State Regulations

3.4.3.2.1 Environmental Protection Regulations

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

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

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

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

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

pollution are described. The General Industrial Permit requires that an annual report be submitted.

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

3.4.3.2.4 Groundwater Quality

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

3.4.3.3 Local

3.4.3.3.1 County NPDES Permit

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

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

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

3.4.3.3.2 County Standards for Drainage

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

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

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

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

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

3.4.3.3.3 City of Carson General Plan

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

3.4.3.3.4 City of Los Angeles General Plan

Requirements for wastewater, stormwater, and water supply for the Wilmington Operations are called out in the Framework Element of the Los Angeles General Plan. Chapter 9: Infrastructure and Public Services, details the requirements applicable to the proposed project. The policies of the Framework Element in all instances are to seek solutions to public infrastructure and service deficiencies, including their expansion commensurate with the levels of demands experienced. In order for the City to provide services that the public expects, it must manage the infrastructure and public services in a manner that avoids depletion or permanent damage of its natural resources. The City must then take four interrelated actions: (a) re-examine

the viability of the existing infrastructure relative to its sustainability; (b) maintain a balance between the rate of population and economic growth and the infrastructure and public services necessary to support that growth; (c) correct deficiencies in these support systems; and (d) coordinate the work of policy implementing agencies so they may better support each other.

3.5 NOISE

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

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

3.5.1 TERMINOLOGY USED IN NOISE ANALYSIS

3.5.1.1 Noise Fundamentals

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

FIGURE 3.5-1

General Noise Sources and Associated Sound Pressure Levels

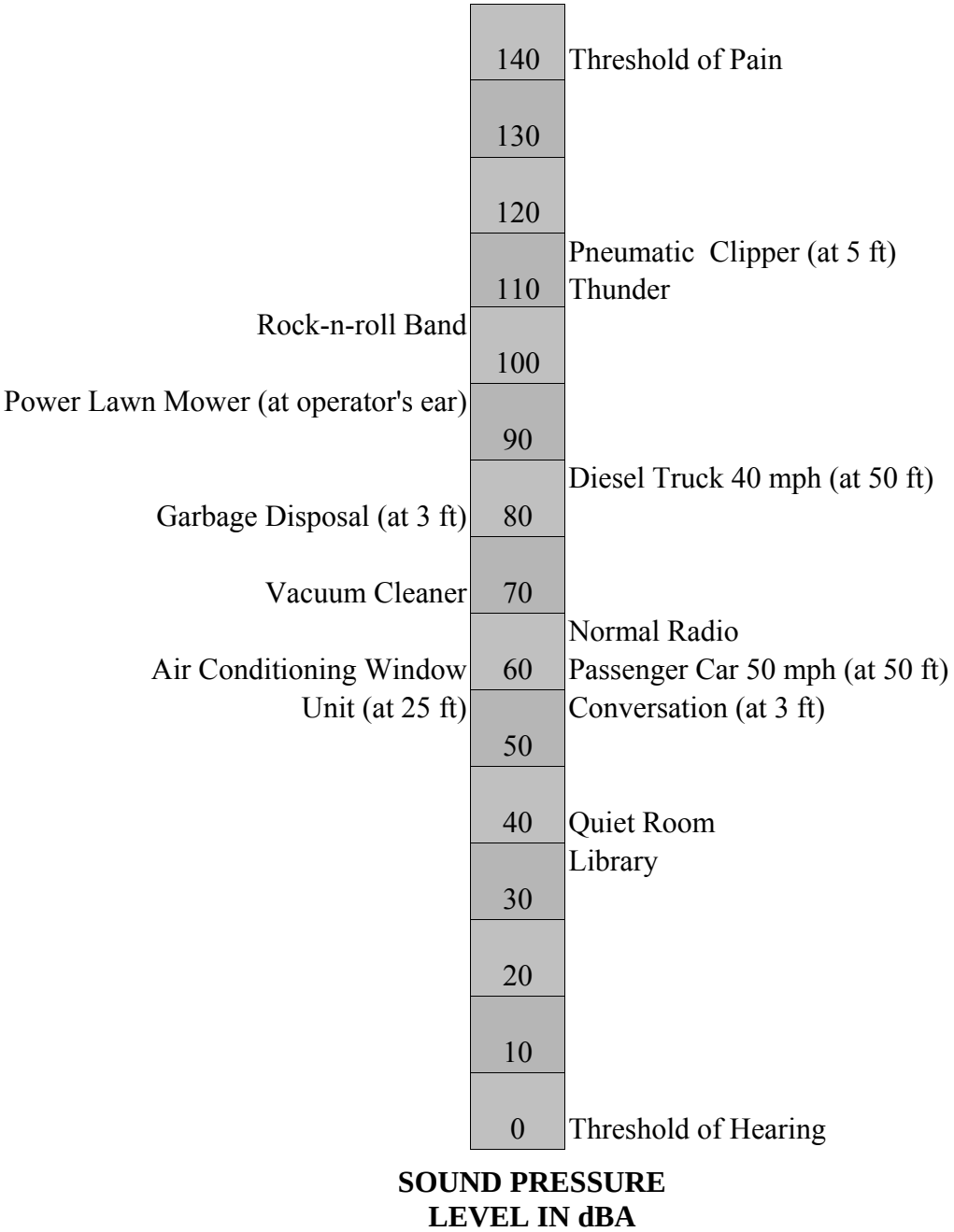


TABLE 3.5-1
Definition of Acoustical Terms

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

3.5.1.2 Decibels and Frequency

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

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

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

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

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

3.5.1.3 Vibration Fundamentals

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

3.5.2 EXISTING REFINERY NOISE SETTING

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

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

3.5.2.1 Sensitive Receptors

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

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

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

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

3.5.2.2 Noise Monitoring

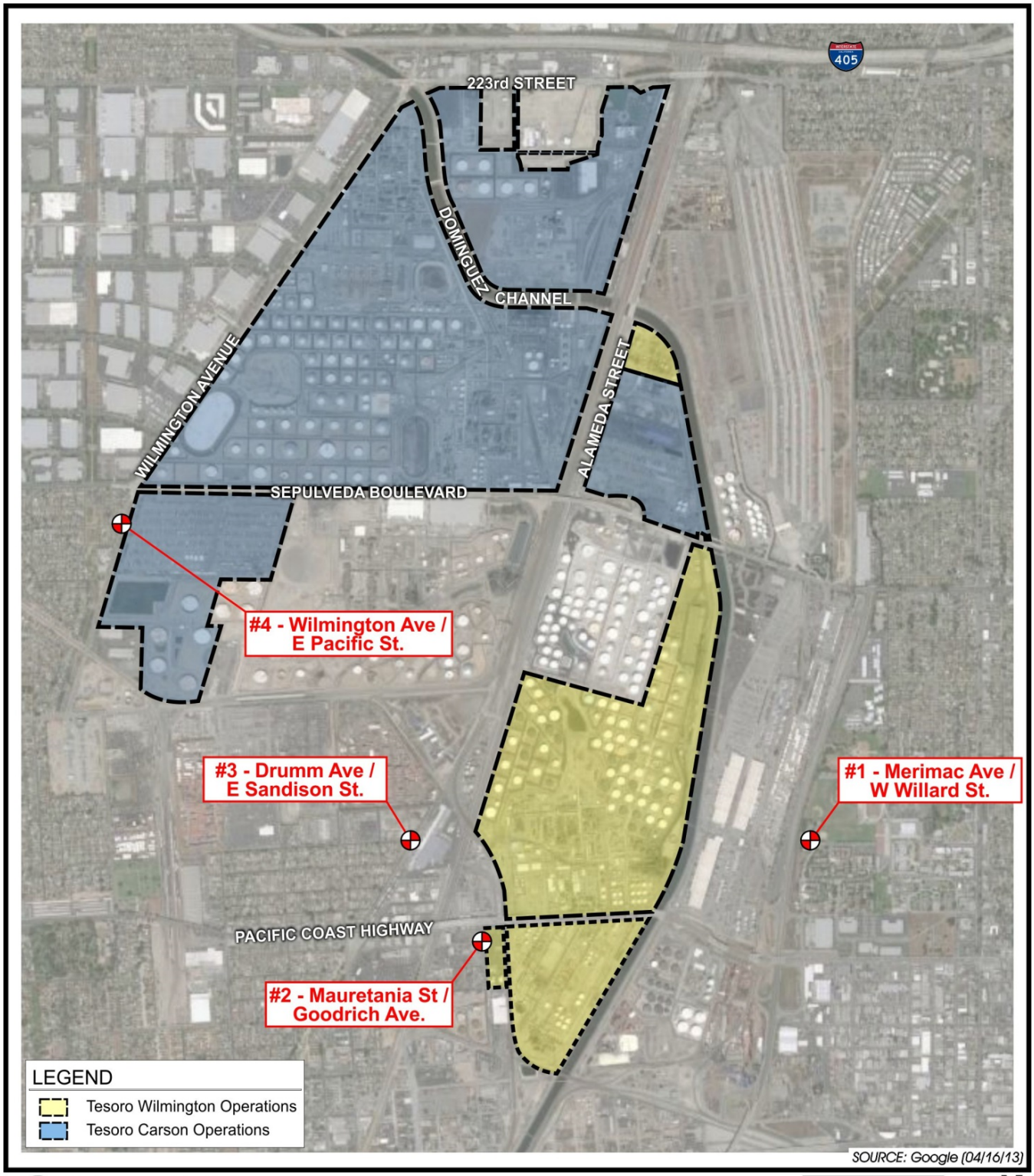
The principle noise sources in an industrial area are impact, friction, vibration, and air turbulence from air and gas streams. Process equipment, heaters, cooling towers, pumps and compressors, contribute to noise emitted from stationary sources at the Refinery. The major noise sources within the Refinery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

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

TABLE 3.5-2

Noise Monitoring Locations

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



Environmental Audit, Inc.

0 2,000'

N

FIGURE 3.5-2
NOISE MONITORING LOCATIONS
TESORO LOS ANGELES REFINERY

Project No. 2844

N:\2844\Noise Monitoring Locations.cdr

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

TABLE 3.5-3

Existing Noise Levels

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

Source: Appendix D, Noise Impact Assessment for the Tesoro LA Refinery Integration and Compliance Project.
(a) The average A-weighted noise level measured during the daytime.
(b) The average A-weighted noise level measured during the nighttime.

3.5.3 REGULATORY BACKGROUND

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

3.5.3.1 Noise Regulations for Worker Protection

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

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

3.5.3.2 State Noise Regulations

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

3.5.3.3 Local Noise Regulations

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

3.5.3.3.1 City of Los Angeles Municipal Code

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

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

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

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

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

3.5.3.3.2 Wilmington-Harbor City Community Plan

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

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

3.5.3.3.3 City of Los Angeles Noise Element

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

TABLE 3.5-4

City of Los Angeles Land Use Noise Compatibility Guidelines

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

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

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

3.5.3.3.4 City of Carson Municipal Code

Carson's Municipal Code, Ordinance No. 95-1068, limits long-term construction noise (periods of 21 days or more) to 65 dBA in the daytime (7 a.m. to 6 p.m.). In addition, non-urgent and essential construction is generally prohibited without a special permit between 6 p.m. and 7 a.m., and on weekends. If the City Engineer determines that the public health, safety, comfort, and

convenience will not be affected during these times, he may grant special permission for certain noise-generating activities.

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

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

TABLE 3.5-5

City of Carson Noise Ordinance

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

Source: City of Carson Ordinance No. 4101
(a) Residential and commercial nighttime limits (10 p.m. – 7 a.m.) are 5 dBA lower. Tonal or impulsive type noise also reduces limit by 5 dBA.
(b) If ambient noise exceed limit then limit is increased to ambient noise.
Key: L_X – A-weighted sound level, L, that may not be exceeded more than "x" percent of the measured time period.
L_{max} = Maximum A-weighted sound level

3.5.3.3.5 City of Carson Noise Element

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

TABLE 3.5-6

City of Carson Land Use Noise Compatibility Guidelines

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

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

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

3.6 SOLID AND HAZARDOUS WASTE

3.6.1 SOLID WASTE

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

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

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

TABLE 3.6-1

Solid Waste Disposed in 2013 by County

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

Source: CalRecycle, 2014

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

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

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

TABLE 3.6-2

Class III Landfills and Related Capacity

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

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

TABLE 3.6-3

Waste Transformation Facilities and Related Capacity

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

Source: County of Los Angeles, 2013

3.6.1.1 Los Angeles County

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

In 2012, residents and businesses in the County disposed of 8.72 million tons of solid waste at Class III landfills and transformation facilities located in and out of the County (see Tables 3.6-4

and 3.6-5). In addition, the amount of inert waste disposed at permitted inert waste landfills totaled 89,142 tons (County of Los Angeles, 2013).

TABLE 3.6-4

Annual Disposal Tonnage for 2012 (County of Los Angeles)

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

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

TABLE 3.6-5

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

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

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

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

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

TABLE 3.6-6

Los Angeles County Landfill Status

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

Source: County of Los Angeles, 2013

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

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

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

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

(e) Currently only accepting inert waste.

In addition, there are 44 permitted large volume transfer/processing and direct transfer facilities, which are permitted to receive 100 tons of waste or more per operating day, and numerous

facilities of smaller volume operating in the County. As local waste disposal capacity options diminish in the county, transfer and processing facilities operators are expected to ship waste to out-of-County landfills via truck or rail transport.

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

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

3.6.1.2 Tesoro Los Angeles Refinery

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

TABLE 3.6-7

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

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

3.6.2 HAZARDOUS WASTE MANAGEMENT

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

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

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

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

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

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

TABLE 3.6-8

Hazardous Waste Generation 2013
(tons per year)

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

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

3.6.2.1 Tesoro Los Angeles Refinery

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

TABLE 3.6-9

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

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

3.6.3 REGULATORY BACKGROUND

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

3.6.3.1 Federal

3.6.3.1.1 Code of Federal Regulations

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

3.6.3.2 State

3.6.3.2.1 California Solid Waste Reuse and Recycling Access Act

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

3.6.3.2.2 AB 939: California Integrated Waste Management Act

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

3.6.3.3 Local

3.6.3.3.1 City of Los Angeles Solid Waste Management Policy Plan

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

3.6.3.3.2 Solid Waste Integrated Resources Plan

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

3.6.3.3.3 Industrial Waste Control Ordinance

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

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

3.6.3.3.4 City of Carson Sewage and Industrial Waste Ordinance

The City of Carson adopted by reference the Title 20, Utilities, Division 2, Sanitary Sewers and Industrial Waste, of the Los Angeles County Code as amended and in effect on January 2, 1990,

with three amendments as the Sewage and Industrial Ordinance (Carson Municipal Code Sections 8500 - 8505).

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

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

3.7 TRANSPORTATION AND TRAFFIC

3.7.1 REGIONAL CIRCULATION

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

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

3.7.2 LOCAL CIRCULATION

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

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

The proposed project area includes two north-south highways that extend from the port area to downtown Los Angeles: Interstate 710 on the east side of the Refinery and Interstate 110 on the

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

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

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

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

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

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

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

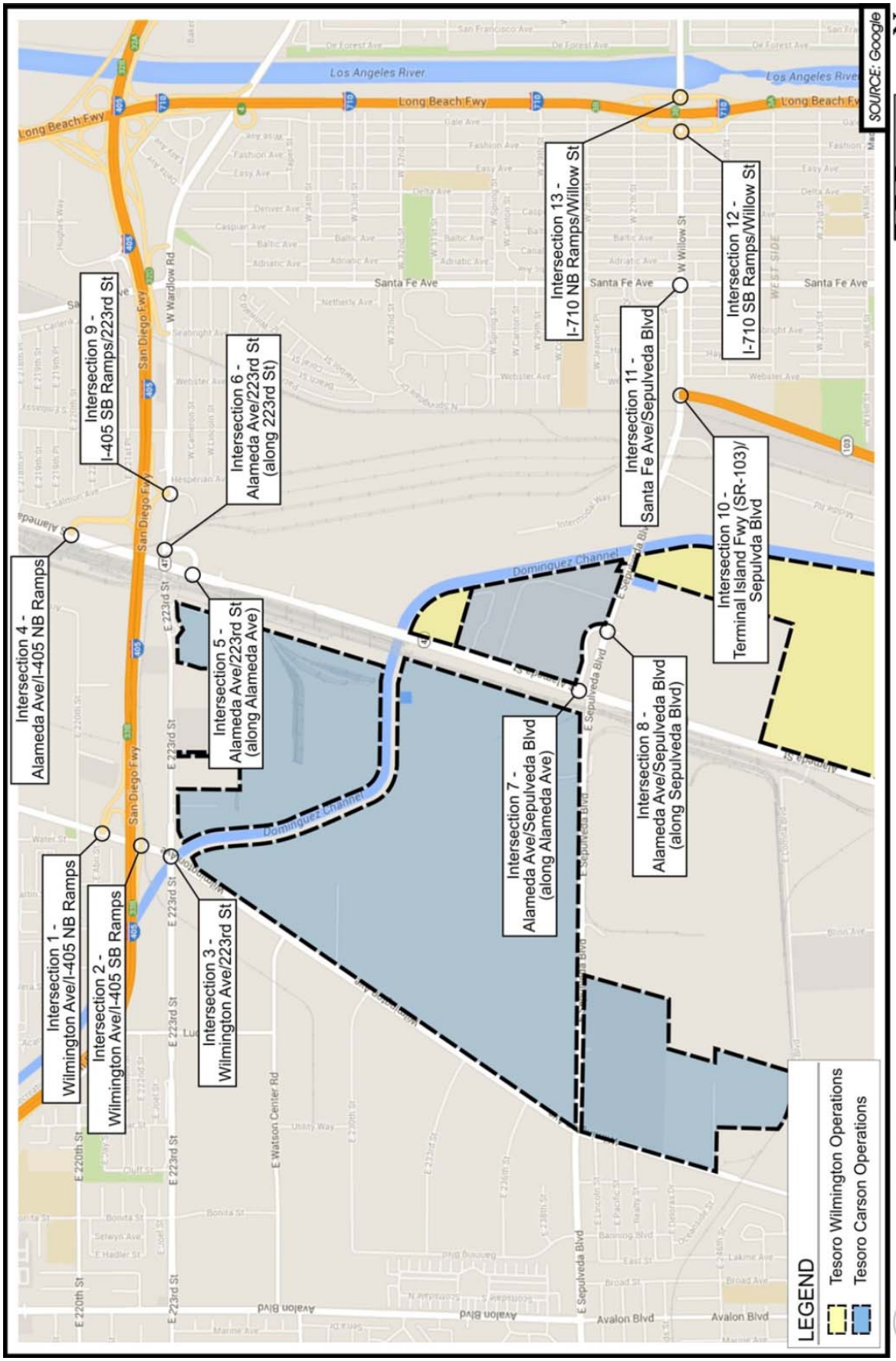


FIGURE 3.7-1
TRAFFIC INTERSECTION MAP
TESORO LOS ANGELES REFINERY

Environmental Audit, Inc.

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

3.7.3 EXISTING TRAFFIC CONDITIONS

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

3.7.3.1 Intersection Level of Service Criteria

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

3.7.3.2 Intersection Level of Service Methodology

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

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

TABLE 3.7-1

Level of Service Definitions

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

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

3.7.3.3 Existing Intersection Operating Conditions

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

TABLE 3.7-2

Existing Intersection Peak Hour LOS

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

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

3.7.3.4 Baseline Transit Service

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

Metro Line 202 – This line operates between Wilmington and Watts. Within the study area, this line travels north and south along AlamedaStreet. Service is provided at 60 minute headways

during weekday peak periods, late night, and owl service. Weekend and holiday service is not provided.

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

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

3.7.3.5 Bicycles and Pedestrians

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

3.7.3.6 Baseline Rail Setting

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

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

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

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

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

3.7.4 REGULATORY BACKGROUND

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

3.7.4.1 Federal

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

3.7.4.2 Congestion Management Program (State and Local Requirements)

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

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

3.7.4.3 Local

3.7.4.3.1 County of Los Angeles

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

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

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

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

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

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

3.7.4.3.2 City of Los Angeles

The City of Los Angeles Transportation Element of the General Plan was adopted in 1999. In 2015, the City adopted the Mobility Plan 2035, which is an update to the 1999 Transportation Element (City of Los Angeles, 2015). The purpose of the Mobility Plan Element is to present a guide to the further development of a citywide transportation system which provides for the efficient movement of people and goods. This Mobility Element recognizes that primary emphasis must be placed on maximizing the efficiency of existing and proposed transportation infrastructure through advanced transportation technology, through reduction of vehicle trips, and through focusing growth in proximity to public transit. The Mobility Element recognizes that locating land uses that better serve the needs of the population closer to where they work and lives reduces the number and distance of vehicle trips and decreases the amount of pollution

from mobile sources. The Mobility Element provides numerous policies to enhance transportation systems in the City. For example, Policy 5.2 supports ways to reduce vehicle miles traveled (VMT) per capita. The Mobility Element identifies the major roadways and designated truck routes throughout the City. No policies are directly relevant to the proposed project modifications as the proposed project will not result in an increase in vehicle trips, once construction is completed.

3.4.4.3.3 City of Carson

The City of Carson Transportation and Infrastructure Element of the General Plan was adopted in 2004. The purpose of this Element is to document the methods and results of the analysis of the existing and projected future circulation conditions in the City of Carson. The Element identifies the major roadways and designated truck routes throughout the City. No policies are directly relevant to the proposed project modifications.

3.4.4.3.4 City of Long Beach

The City of Long Beach Mobility Element of the General Plan was adopted in 2013 to replace the Transportation Element adopted in 1991. The Mobility Element describes the general location and extent of existing and proposed major thoroughfares, transportation routes, terminals, ports, and other local public utilities and facilities. The Element strives to balance the use of the transportation network that meets the needs of all users of streets, roads, and highways, while providing safe and convenient travel options that are suitable for the urban and suburban context of the City's neighborhoods and districts. The Element identifies the major roadways and designated truck routes throughout the City. The Element contains policies and strategies to support goods movement. No policies or strategies are directly relevant to the proposed project modifications.

3.7.4.3.5 Intersection Operations

The study intersections in the vicinity of the proposed project are located in the City of Los Angeles, the City of Long Beach, and the City of Carson.

In the City of Los Angeles, LOS D is the minimum acceptable threshold; however, the City has a sliding scale of significance for service levels C, D, E and F-- a greater effect is allowed under LOS C than LOS D before being considered a significant impact. The City of Los Angeles significance scale is as follows:

- V/C ratio increase greater than or equal to 0.040 if final LOS is C,
- V/C ratio increase greater than or equal to 0.020 if final LOS is D, or
- V/C ratio increase greater than or equal to 0.010 if final LOS is E or F.

The cities of Long Beach and Carson consider LOS D to be the minimum acceptable level of service, and a significant impact is considered to be a project-related change in V/C ratio of 0.02 or greater.

3.7.4.4 Rail Operations

The California Public Utilities Commission (CPUC) has regulatory authority over rail operations and grade crossings throughout the state. No grade crossings would be added as part of the proposed project.