CHAPTER 4

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

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4.0 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 INTRODUCTION

This chapter assesses the potential environmental impacts of the construction and operation of the Tesoro Reliability Improvement and Regulatory Compliance Project discussed in Chapter 2.

Chapter 4 evaluates those impacts that are considered potentially significant under the requirements of CEQA, for those environmental areas identified in the NOP/IS (see Appendix A). Specifically, an impact is considered significant under CEQA if it leads to a "substantial, or potentially substantial, adverse change in the environment." Impacts from the proposed project fall within one of the following categories:

Beneficial – Impacts will have a positive effect on the resource.

No impact – There would be no impact to the identified resource as a result of the proposed project.

Adverse but not significant – Some impacts may result from the project; however, they are judged to be insignificant. Impacts are frequently considered insignificant when the changes are minor relative to the size of the available resource base or would not change an existing resource.

Potentially significant but mitigation measures reduce to insignificance – Significant adverse impacts may occur; however, with proper mitigation, the impacts can be reduced to insignificance.

Potentially significant and mitigation measures are not available to reduce to insignificance – Adverse impacts may occur that would be significant even after mitigation measures have been applied to lessen their severity.

4.2 AIR QUALITY

The NOP/IS (see Appendix A) identified the air quality impacts of the proposed project at the Tesoro Refinery and SRP as having the potential for significant adverse impacts. Project-specific and cumulative adverse air quality impacts associated with increased emissions of air contaminants (both criteria air pollutants and TACs) during the construction and operation phases of the proposed project have been evaluated in this EIR. Impacts to sensitive receptors have also been analyzed in the EIR. The air quality impacts at the Refinery and the SRP and the surrounding areas are provided in this section.

While the proposed project is expected to emit GHGs, emitting GHGs from a single project into the atmosphere would not necessarily create a significant adverse project-specific global climate change effect. Rather, it is the increased accumulation of GHG emissions from more

than one project or many individual sources that may contribute to adverse global climate change impacts. The resultant consequences of that climate change can cause adverse environmental effects such as flooding of coastal areas, increased fire hazards, etc.. In virtually every project subject to CEQA review, a project's GHG emissions will be relatively small compared to global or even statewide GHG emissions, and, as such, will almost certainly have no detectable impact on global climate change. Due to the complex physical, chemical, and atmospheric mechanisms involved in global climate change, sufficient tools are not yet available to accurately identify the specific impact, if any, to global climate change from one project's incremental increase in global GHG emissions. As such, project-specific GHG emissions and determining the significance of potential impacts are more properly assessed on a cumulative basis.

For the above reasons, the analysis of GHG emission is more appropriately analyzed as a cumulative impact. Therefore, the existing GHG setting (baseline), project-specific emissions that contribute to cumulative climate change impacts, and the determination of where or not project-specific GHG emission impacts are considered to be cumulatively considerable and, therefore, contribute to cumulative climate change impacts are discussed in Chapter 5 – Cumulative Impacts, not in the project-specific impacts chapter, Chapter 4, as is typically the case when analyzing other types of project-specific impacts in EIRs prepared by the SCAQMD.

4.2.1 SIGNIFICANCE CRITERIA

To determine whether or not air quality impacts from the proposed project are significant, impacts will be evaluated and compared to the significance criteria in Table 4-1. If impacts equal or exceed any of the criteria in Table 4-1, they will be considered significant.

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

Subsequent to the adoption of the SCAQMD CEQA Air Quality Handbook (SCAQMD, 1993), the SCAQMD adopted Regulation XX - RECLAIM, which fundamentally changed the framework of air quality rules and permits. The RECLAIM program is a pollution cap-and-trade program which applies to the largest sources of NOx and SOx emissions within the jurisdiction of the SCAQMD. RECLAIM facilities were given an initial emissions allocation that reflected their historical NOx or SOx usage, but that declines yearly to reduce total facility-wide emissions. Operators of RECLAIM facilities are also allowed to buy credits in lieu of reducing facility emissions or selling credits if they control emissions more than required. After implementation of the RECLAIM program, the SCAQMD staff examined how to apply the CEQA significance thresholds to RECLAIM facilities, recognizing that CEQA case law directs that the existing environmental setting include permits and approvals that entitle operators to conduct or continue certain activities. SCAQMD staff determined that the baseline should consist of the RECLAIM initial allocation for each RECLAIM

TABLE 4-1

Air Quality Significance Thresholds

Mass Daily Thresholds		
Pollutant	**Construction**	**Operation**
NO_x	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
PM2.5	55 lbs/day	55 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
Toxic Air Contaminants and Odor Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk $\geq$ 10 in 1 million Hazard Index $\geq$ 1.0 (project increment) Cancer Burden $\geq$ 0.5	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
Ambient Air Quality for Criteria Pollutants[(a)]		
NO_2 1-hour average annual average	In attainment; significant if project causes or contributes to an exceedance of any standard: 0.25 ppm (state) 0.053 ppm (federal)	
PM10 24-hour annual geometric mean annual arithmetic mean	 10.4 $\mu g/m^3$ (recommended for construction)[(b)] 2.5 $\mu g/m^3$ (operation) 1.0 $\mu g/m^3$ 20 $\mu g/m^3$	
PM2.5 24-hour average	 10.4 $\mu g/m^3$ (construction)[e] & 2.5 $\mu g/m^3$ (operation)	
Sulfate 24-hour average	 1 $\mu g/m^3$	
CO 1-hour average 8-hour average	In attainment; significant if project causes or contributes to an exceedance of any standard: 20 ppm (state) 9.0 ppm (state/federal)	

(a) Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated. The NO_2,1-hour average, CO 1-hour and 8-hour average, and PM10 and PM2.5 24-hour averages also apply as Localized Significance Thresholds (LST).

(b) Ambient air quality threshold based on SCAQMD Rule 403.

ppm = parts per million; $\mu g/m^3$ = microgram per cubic meter; mg/m^3 = milligram per cubic meter; lbs/day = pounds per day; $\geq$ greater than or equal to

facility, and that a proposed project would be considered significant if it would cause the facility's emissions to exceed the baseline plus the applicable significance thresholds. However, due to the uncertainty associated with pending litigation (Communities for a Better Environment v. SCAQMD), this EIR will not follow that methodology.

The SCAQMD has revised and updated the methodology for significance determination for RECLAIM facilities. Operational air quality impacts for a RECLAIM facility are considered to be significant if the facility-wide incremental mass daily emissions for NOx and Sox exceed the CEQA significance threshold (i.e., 55 lbs/day for NOx or 150 lbs/day for SOx). The proposed project emissions are considered significant if:

$$(B_{2yr}/365) + I < (E_P + E_F)/365$$

Where:

B_{2yr}= Average facility-wide emissions for the previous two years of operational activity, which is the baseline.

I = Incremental emissions established as significant by the SCAQMD (55 lb/day NO_x or 150 lb/day SO_x).

E_P = Annual emissions increase associated with the proposed project.

E_F = Projected annual emissions for the facility in the year the proposed project will commence proposed operations including the proposed project emissions.

Air quality impacts are considered to be significant if the incremental mass daily operational emissions for NOx and SOx from all proposed project sources, when added to the projected annual emissions for the facility for the year in which the project will commence operations (e.g., 2010 for Tesoro), will be greater than the facility's two-year average emissions (i.e., baseline) plus the significance threshold (i.e., 55 lbs/day for NOx and 150 lbs/day for SOx). In order to make this calculation, the facility's two-year average annual emissions as well as the project's incremental annual emissions are converted to daily emissions by dividing by 365. As discussed in Chapter 3, a two-year Refinery baseline provides a reasonable period of time to take into consideration the variability of the refining operations Tesoro has owned the Refinery for over a year and prior to that time, Shell owned and operated the Refinery. Operations during the past two years are representative of Refinery operations, and therefore, data from the past two years is an appropriate baseline for the purposes of this EIR.

The significance determination methodology described above only applies to NOx and SOx emissions associated with operation of stationary sources and not to other criteria pollutants (i.e., VOC, CO, PM10, and PM2.5) for which the SCAQMD does not regulate under the RECLAIM program or construction emissions. The level of emissions at which CEQA significance is triggered for NOx and SOx emissions at the Refinery ($(B_{2yr}/365) + I$) is calculated in Table 4-2. No change in operational emissions is expected at the SRP. Therefore, CEQA significance for the SRP has not been calculated.

TABLE 4-2

Determining Significance for NOx and SOx Pollutants at the Tesoro Refinery

Pollutant	B_{2yr} 2-Year Average (lbs/yr)[1]	$B_{2yr}/365$ 2-Year Average (lbs/day)	I Significance Threshold (lbs/day)	$B_{2yr}/365 + I$ (lbs/day)
NO_x	1,637,400	4,486.0	**55**	**4,541.0**
SO_x	776,200	2,126.6	**150**	**2,276.6**

(1) See Table 3-3.

4.2.2 ENVIRONMENTAL IMPACTS

4.2.2.1 Construction Emission Impacts

Regional Impacts

Construction emissions are expected from the following equipment and processes:

Onsite Construction Equipment (dump trucks, backhoes, graders, etc.);
Onsite and Offsite Vehicle Emissions, including Delivery Trucks and Worker Vehicles;
Onsite Fugitive Dust Associated with Site Construction Activities;
Onsite and Offsite Fugitive Dust Associated with Travel on Unpaved and Paved Roads; and,
Onsite Architectural Coatings.

Construction emissions were calculated for peak day construction activities in each month construction is expected to occur. As shown in Figure 2-5, construction activities vary for the various portions of the proposed project, but construction activities overlap for a number of portions of the project. Tesoro expects that the start date for construction activities related to the proposed project are expected to begin in the first quarter of 2009. Daily construction emissions were calculated for the peak construction day activities. Peak day emissions are the sum of the highest daily emissions from employee vehicles, fugitive dust sources, construction equipment, and transport activities for the construction period. The peak number of construction workers traveling to the site is expected to be 600. Peak construction emissions for all pollutants are expected to occur in the eighth month of construction, when an estimated 248 construction workers are expected to be required and peak air emissions are primarily from construction equipment.

The peak daily emissions for the Refinery and SRP were calculated for each pollutant and are included in Table 4-3. Detailed construction emissions calculations are provided in Appendix B.

TABLE 4-3

Tesoro Refinery and SRP
Peak Daily Construction Emissions[(1)]
(lbs/day)

ACTIVITY	CO	VOC	NOx	SOx	PM10	PM2.5[(2)]
Construction Equipment	134.92	37.98	277.30	0.30	17.09	15.72
Vehicle Emissions	204.30	25.84	154.90	0.26	27.07	9.20
Fugitive Dust From Construction[(3)]	--	--	--	--	14.02	2.92
Total Construction Emissions[(4)]	**339.22**	**63.82**	**432.20**	**0.56**	**58.18**	**27.84**
SCAQMD Threshold Level	550	75	100	150	150	55
Significant?	NO	NO	YES	NO	NO	NO

(1) Peak emissions for all pollutants predicted to occur during eighth month of construction.
(2) PM2.5 is calculated using SCAQMD's Final Methodology to Calculate Particulate Matter (PM) 2.5 and PM2.5 Significance Thresholds, October 2006.
(3) Assumes application of water three times per day, i.e., complies with SCAQMD Rule 403, Fugitive Dust.
(4) The emissions in the table may differ slightly from those in Appendix B due to rounding.

Construction Equipment

On-site construction equipment will be a source of combustion emissions. Construction equipment may include backhoes, compressors, concrete saws, cranes, excavators, forklifts, front end loaders, generators, roll-off trucks, tractors, water truck and welding machines. The equipment is assumed to be operational between one and ten hours per day with most of the equipment assumed to be operational for ten hours per day. Construction workers are expected to be at the site for longer than ten hours per day. However, factoring in time for lunch and breaks, organization meetings, and so forth, construction equipment would not be expected to operate the entire time. Emission factors for construction equipment were taken from the Construction Equipment Emissions tables (based on the CARB OFFROAD 2007 model) available on the SCAQMD webpage (http://www.aqmd.gov/ceqa/hdbk.html). Estimated peak daily emissions from construction equipment used for construction activities are included in Table 4-3.

Vehicle Emissions

Vehicle emissions include construction workers' vehicles, on-site trucks, and delivery trucks. Emissions generated will include combustion emissions from engines during idling and while

operating. Emissions are also based on the estimated number of trips per day and the round trip travel distances.

Construction vehicles include emissions from construction worker vehicles traveling to and from the work site. During the peak construction month (approximately eighth month of construction) 248 construction worker vehicles per day are anticipated (see Appendix B). Each worker commute vehicle is assumed to travel 16.2 miles (SCAG, 2000) to and from work each day, making two one-way trips per day. Emissions from employee vehicles are presented in Table 4-3 as part of the "Vehicle Emissions" category. Emissions from employee vehicles were calculated using the EMFAC2007 emission factors developed by CARB. Estimated exhaust emissions for workers commuting are included in Table 4-3.

All on-site pick up and on-site delivery trucks are assumed to travel 10 miles per trip.

Heavy-duty diesel trucks include boom trucks, stakebed trucks, flatbed trucks and delivery trucks. Emissions generated will include exhaust emissions from diesel engines while operating. Emissions from trucks (both light-duty and heavy-duty) were calculated using the EMFAC2007 emission factors developed by CARB. Estimated emissions for heavy-duty trucks are included in Table 4-3.

Fugitive Dust Associated with Site Construction Activities

Fugitive dust sources include grading, trenching, wind erosion and truck filling/dumping at the site to construct necessary foundations. During construction activities, water used as a dust suppressant to comply with SCAQMD Rule 403 – Fugitive Dust, will be applied in the construction area during grading, trenching, and earth-moving activities to control or reduce fugitive dust emissions. Application of water reduces emissions by a factor of approximately 34 to 61 percent (WRAP, 2006). It is assumed herein that two applications of water per day would reduce emissions by 50 percent, and three applications per day reduce emissions by 61 percent. Fugitive dust suppression, often using water, is a standard operating practice and is one method of complying with SCAQMD Rule 403. Estimated peak controlled PM10 and PM2.5 emissions during peak construction activities for fugitive dust sources are 14.02 and 2.92 pounds per day, respectively (see Table 4-3). The detailed emission calculations are provided in Appendix B.

Fugitive Dust Associated with Travel on Paved and Unpaved Roads

Vehicles and trucks traveling on paved and unpaved roads are also a source of fugitive emissions during the construction period. Fugitive dust emissions were also calculated for on-site cars and light-duty trucks. The fugitive emissions for trucks assume delivery trucks will travel on paved roads and water trucks will travel on paved roads within the Refinery. Emissions of dust caused by travel on paved roads were calculated using the U.S. EPA's, AP-42, Section 13.2.1 emission factor for travel on paved roads and using the CARB's Methodology 7.9 to determining the appropriate silt loading. No travel on unpaved roads is expected because the roads within the Refinery and SRP are paved (see Appendix B). The estimated PM10 and PM2.5 fugitive dust emissions during peak construction activities (June

2009) from trucks and passenger cars on paved roads are 27.07 pounds per day and 9.20 pounds per day, respectively (see Table 4-3 and Appendix B, Table B-4).

Architectural Coatings

The proposed project specifications call for the painting of vessels and piping with a paint that does not contain VOCs. As supported by extensive research with architectural coatings by the SCAQMD, there are sufficient industrial coatings formulated with high solids and zero VOCs to accommodate the project. Therefore, no VOC emissions would be expected from the use of architectural coatings during peak construction activities.

Miscellaneous Emissions

In addition to the construction-related emissions already identified for the proposed project, the project could generate emissions of VOC if contaminated soil is found and soil remediation activities are necessary. VOC contaminated soil is defined as soil which registers 50 parts per million or greater per the requirements of SCAQMD Rule 1166 – Volatile Organic Compound Emissions from Decontamination of Soil. If VOC contamination is found, soil remediation must occur under an SCAQMD-approved Rule 1166 Plan to assure the control of fugitive emissions which generally includes covering contaminated soil piles with heavy plastic sheeting and watering activities to assure the soil remains moist. Soil remediation activities are under the jurisdiction of the RWQCB and it may be necessary for the RWQCB and SCAQMD to coordinate in order to assure air quality impacts are adequately mitigated. Emission estimates for VOC would be speculative at this time, however, because the levels of contamination are currently unknown.

Construction Emission Summary

Construction activities associated with the modifications to the Refinery and SRP would result in emissions of CO, VOC, NOx, SOx, PM10, and PM2.5. Construction emissions for the proposed project are summarized in Table 4-3, together with the SCAQMD's daily construction threshold levels. The construction phase of the proposed project will not exceed the significance thresholds for CO, VOC, SOx, PM10, and PM2.5. The construction phase of the proposed project will exceed the significance threshold only for NOx. Therefore, the air quality impacts associated with construction activities are considered significant.

Localized Construction Impacts

The SCAQMD has developed Localized Significance Threshold (LST) Methodology to evaluate the potential localized impacts of criteria pollutants from construction activities (SCAQMD, 2008). The LST Methodology requires that the emissions of criteria pollutants be evaluated for impacts from CO, NO_2, PM10, and PM2.5 emissions associated with the proposed project that may exceed applicable LST at nearby sensitive receptors. Two approaches are presented in the SCAQMD LST Methodology – a screening look-up table method and a detailed modeling method. The proposed project includes construction at the Refinery and the SRP, which are separate locations. Therefore, the localized construction

impacts were evaluated separately. The detailed modeling methodology was used for the Refinery due to the multiple construction locations within the Refinery. The screening methodology was used for the SRP due to the limited construction that is expected to occur at the SRP.

Refinery Impact Evaluation

In order to determine the groundlevel pollutant concentrations near the Refinery as a result of the project, the U.S. EPA Industrial Source Complex – Short Term Model (ISCST3) (Version 02035) air dispersion model was used to model the peak daily construction emissions (see Table 4-3) and calculate the annual average and maximum 1-hour, 8-hour, and 24-hour concentrations for the Sensitive Receptor Area 4 – South Coastal Los Angeles County, which encompasses the Refinery, The details of the assumptions used in the modeling are provided in Appendix B.

To determine the significance of construction PM10 and PM2.5 emissions, project emissions are compared to 10.4 $\mu g/m^3$, which is comparable to the fugitive dust control requirement in Rule 403. PM10 and PM2.5 are evaluated differently than CO and NO_2 because PM10 and PM2.5 in nearly the entire district exceed the state or federal PM10 and PM2.5 standards. For CO and NO_2, which are in attainment with all state and national standards, the CO 1-hour, CO 8-hour, NO_2 1-hour, and NO_2 annual average groundlevel concentrations from the proposed project are combined with the maximum ambient concentrations and compared to the most stringent ambient air quality standard. The results are shown in Table 4-4 (see Appendix B for more detailed calculations).

TABLE 4-4

Localized Significance Threshold Evaluation for Refinery Construction Emissions

Criteria Pollutant	Averaging Period	Ambient Back-ground Conc. (ug/m^3)	Calculated Conc. (ug/m^3)	Total Conc. (ug/m^3)	Most Stringent Air Quality Standard (ug/m^3)	Localized Significance Threshold (ug/m^3)	Exceeds Threshold?
CO	1-hour	4597.6	366.9	4964.5	23000		No
	8-hour	4022.9	79.1	4102.0	10000		No
NO_2	1-hour	264.3	186.8	451.1	500		No
	Annual	45.5	2.0	47.5	100		No
PM10	24-hour		9.2			10.4	No
PM2.5	24-hour		<9.2(1)			10.4	No

(1) Since PM2.5 emissions are a fraction of PM10 emissions and the significance thresholds are the same for PM10 and PM2.5, PM2.5 emissions were not modeled.

The LST analysis for the Refinery indicates that NO_2, CO, PM10, or PM2.5 emissions do not exceed the LST in Table 4-1 from construction activities associated with the proposed project. Therefore, the proposed Refinery project does not exceed any of the applicable

LSTs, so no significant localized air quality impacts during the construction period are expected.

SRP Impact Evaluation

In order to determine the localized air quality impacts of construction at the SRP, the construction emissions were also compared to the SCAQMD's LSTs (SCAQMD, 2008) (see Appendix B) for a one-acre project. The LSTs are used to determine whether or not a project may generate significant adverse air quality impacts to the local sensitive receptors in the vicinity of the proposed project. The SRP is located in Source Receptor Area 4 (http://www.aqmd.gov/ceqa/handbook/LST/SRA_City.xls, SCAQMD, 2008). The estimated construction emissions associated with construction at the SRP were compared to the localized significance thresholds for CO, NOx, PM10, and PM2.5. As shown in Table 4-5, in all cases, the construction emissions were below the LSTs (see Appendix B). Therefore, no significant localized air quality impacts are expected.

Table 4-5

Localized Significance Threshold Evaluation for SRP Construction Emissions

Emission Source	On-site Source Emissions (lbs/day)					
	CO	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**
Off-road Construction Equipment	19.40	5.61	30.36	0.03	2.24	2.06
On-road Construction Equipment	0.50	0.06	0.22	0.00	0.05	0.02
Fugitive Construction Emissions	0.00	0.00	0.00	0.00	0.00	0.00
Total On-site Emissions	**19.90**	**5.67**	**30.58**	**0.03**	**2.29**	**2.08**
Screening Value[(1)(2)]	**126**	**NA**	**271**	**NA**	**4**	**3**
Above Value?	**NO**	**-**	**NO**	**-**	**NO**	**NO**

(1) Screening values for LST analysis from SCAQMD Final Localized Significance Threshold Methodology, Appendix C (June 2003).
(2) Screening Value for PM2.5 from SCAQMD Final Methodology to Calculate PM2.5 and PM2.5 Significance Thresholds, Appendix B (October 2006).

The LST analysis for both the Refinery and SRP indicates that NO_2, CO, PM10, or PM2.5 emissions do not exceed the LSTs in Table 4-1 from construction activities associated with the proposed project. Therefore, the proposed project does not exceed any applicable LSTs at both the Refinery and SRP, so no localized significant impacts to the nearest sensitive receptor during the construction period are expected.

4.2.2.2 Operational Emission Impacts

The proposed project operational emissions are evaluated in this section. Operational emissions include both stationary and mobile sources. Stationary sources include combustion sources and fugitive sources. Detailed operational emission calculations are

provided in Appendix C. The total operational emissions from the proposed project are identified in Table 4-6. The primary sources of emissions are from modifications to, and replacement of, units including replacement of two existing cogeneration units (Cogens A and B) with a new cogeneration unit (Cogen C); replacement of four existing boilers (Boilers 7, 8, 9, and 10) with two new boilers (Boilers 11 and 12); new fuel gas treatment unit; new ammonia storage tank; LPG recovery; DCU modifications; HCU modifications; FCCU modifications; replacement of coke handling, screening, and loading system; HTU modifications; amine sour water reliability upgrades; SRP modifications; atmospheric PRD modifications; new sulfur treatment units for sour gas; and, a new crude storage tank. The proposed new units and modifications at the Refinery and SRP are expected to generate emissions primarily from the installation of fugitive components (e.g., pumps, valves, and flanges), as well as the new Cogen C and Boilers 11 and 12, which will, in addition to fugitive emissions, generate criteria pollutant emissions from combustion. However, some of combustion emissions will be result in emission reductions from the project due to the replacement of older equipment. Equipment potentially impacted by the proposed project (upstream or downstream) were evaluated to determine if the proposed project would result in an emissions increase, even though the equipment is operating within permit limits and no permit modification would be required. Due to the nature of Refinery operations, all equipment will fluctuate in activity levels. However, no other equipment, beyond those evaluated in the proposed project, were identified that would result in an increase in emissions strictly due to the proposed project. Although, emission increases are expected, due to increases in vehicle trips from mobile sources, with the exception of VOC emissions, overall refinery emissions are expected to be reduced as a result of the implementation of the proposed project.

Operational efficiency is expected to increase at the SRP. However, no emissions changes are expected to occur at the SRP because the operational efficiency modifications do not change the fuel combustion rates and the associated emissions.

Fugitive Emissions

Fugitive emissions will also be associated with modifications at the Refinery. No emission changes from fugitives at the SRP are expected because the installation of the oxygen tank and the associated piping will not produce VOC emissions. Fugitive VOC emission sources are from process equipment components such as valves, flanges, vents, pumps, drains, and compressors. The emission calculations herein are based on emission factors that are outlined in a Memorandum from the SCAQMD dated April 2, 1999 (SCAQMD, 1999). The Memorandum provides the appropriate emission factors for fugitive sources that include BACT and lowest achievable emission reductions (LAER). Modifications to existing and new equipment are required to comply with BACT requirements in SCAQMD Rules 1303 or 2005 for RECLAIM equipment.

Additional documentation of the procedures used to calculate the emissions estimates is provided in Appendix C. All new and modified process components are required to conform to the SCAQMD's BACT Guidelines. The estimated emissions presented in Table 4-6 are based on preliminary design information with limited or no BACT applied to fugitive

TABLE 4-6

Tesoro Refinery
Stationary Source Operational Emissions from the Proposed Project
(lbs/day)

Sources	CO	VOC	NOx	SOx	PM10	PM2.5[1]
STATIONARY SOURCES:						
Fugitive Emissions						
New Cogeneration Unit (Cogen C)	--	34.9	--	--	--	--
New Boilers (Boilers 11 & 12)	--	15.7	--	--	--	--
LPG/HCU	--	8.2	--	--	--	--
LPG/FCCU	--	3.3	--	--	--	--
LPG/DCU	--	7.1	--	--	--	--
Fuel Gas Treatment Unit	--	68.8	--	--	--	--
Amine Flash	--	9.9	--	--	--	--
Coker Blowdown	--	5.0	--	--	--	
DCU Modifications	--	6.1	--	--	--	--
Sour Gas Treatment	--	8.4	--	--	--	--
HTU-2		3.5				
H-101		5.6				
~~Ammonia Storage~~ *PRDs Connected to Flare*	--	6.8	--	--	--	--
~~Generator~~ *Emergency I.C. Engine*	--	3.2	--	--	--	--
Crude Storage Tank	--	16.1	--	--	--	--
Coke Handling Facilities	--	--	--	--	--	--
Combustion Sources						
New Boiler 11	~~312.2~~ *321.6*	38.7	~~92.4~~ *111.21*	40.8	91.2	89.4
New Boiler 12	~~312.2~~ *321.6*	38.7	~~92.4~~ *111.21*	40.8	91.2	89.4
Retired Boilers 7 -10[2]	-1233.4	-80.8	-1468.3	-494.6	-308.4	-302.2
New Cogen C	~~57.4~~ *111.4*	36.0	~~134.4~~ *155.0*	103.0	159.4	159.0
Replaced Cogens A & B[2]	-1542.9	-39.5	-602.1	-528.7	-264.0	-263.5
~~Backup Generator~~ *Emergency I.C. Engine*	181.9	66.9	836.3	12.7	59.7	58.5
Total Stationary Source Emissions[2][3]	**~~-1913.0~~ -1839.8**	**262.6**	**~~-914.9~~ *-856.7***	**-826.0**	**-170.9**	**-169.4**
OFF-SITE EMISSION SOURCES:						
Delivery Trucks	0.67	0.17	2.07	<0.01	0.10	0.09
Fugitive Road Dust	--	--	--	--	1.21	0.20
Total Off-Site Emission Increases:	**0.7**	**0.2**	**2.1**	**<0.01**	**1.3**	**0.3**
Total Operational Emission Increases[2]:	**~~-1912.3~~ -1839.1**	**262.8**	**~~-912.8~~ *-854.6***	**-826.0**	**-169.6**	**-169.1**

(1) PM2.5 is determined by ratio to PM10 using Appendix A of the SCAQMD PM2.5 Localized Significance Threshold Methodology.
(2) Negative numbers represent emission decreases.
(3) Differences in totals as compared to Appendix C are due to rounding.

components. Final designs as permitted will include the same or similar BACT components that will lower the emission estimates from those presented in Table 4-6. The BACT associated with each of the major project components is discussed below. Fugitive emission sources are also regulated under New Source Performance Standards (NSPS) Subpart GGG and SCAQMD Rule 1173.

Process Pumps: Sealless pumps will be used, to the extent feasible and commercially available, as BACT for pumps in light hydrocarbon service. For those instances where sealless pumps are deemed unacceptable, two types of double or tandem mechanical seals will be evaluated for use: (1) tandem mechanical seals that use a barrier fluid and a seal pot vented to a closed system; and (2) dry-running tandem mechanical seals vented to a closed system. The dry-running tandem mechanical seals are considered to be equivalent control technology since they control fugitive VOC emissions as well as the tandem mechanical seals with the barrier system. All pumps will be subject to an SCAQMD-approved inspection and maintenance program, as required under SCAQMD Rule 1173.

Process Valves: Bellow sealed valves will be installed on project components to reduce fugitive VOC emissions. The SCAQMD BACT/LAER guidelines indicate that leakless valves must be used, except for the following applications.

- Heavy hydrocarbon liquid service
- Control valves
- Instrument tubing/piping
- Installations where valve failure could pose a safety hazard (e.g. drain valves with stems in a horizontal position)
- Retrofit/special applications with space limitations
- Applications requiring torsional valve stem motion
- Valves not commercially available
- Components exclusively handling commercial natural gas
- Components exclusively handling fluids with a VOC concentration of ten percent by weight or less
- Components incorporated in lines while operating under negative pressure
- Lubricating fluids
- Components buried below ground
- Components handling liquids exclusively, if the weight percent evaporated is ten percent or less at 150 degrees Centigrade, as determined by ASTM Method D-86
- Pressure vacuum valves on storage tanks

For heavy hydrocarbon liquids and for applications where leakless valves cannot be used, valves of standard API/ANSI design will be used. Fugitive VOC emissions from light liquid valves will be monitored and controlled in accordance with an SCAQMD-approved inspection and maintenance program, as required under SCAQMD Rule 1173. Valves in gas/vapor and in light liquid service initially will be monitored on a monthly basis, in compliance with the Federal Standards of Performance for Equipment Leaks of

VOC in Petroleum Refineries (40 CFR Part 60, Subpart GGG). Valves that do not leak during two successive monthly inspections will revert to a quarterly inspection interval. New valves will be subject to a 500 ppm limit.

Process Drains: New process drain lines will be provided with two normally closed block valves in series, or a single block valve in series with a cap or plug as required under SCAQMD Rule 1173. New drain hubs (funnels) will be equipped with P-Traps and/or seal pots along with an SCAQMD-approved inspection and maintenance program, as required under SCAQMD Rule 1176.

Flanges: The use of flanged connections will be minimized to the extent practicable. Where required for maintenance or other routine operations, flanged connections will be designed in accordance with ANSI B16.5-1988, Pipe Flanges and Flanged Fittings. Fugitive emissions will be monitored and controlled in accordance with an approved inspection and maintenance program, as required under SCAQMD Rule 1173.

Pressure Relief Devices (PRDs): PRDs will be routed to the existing and new Refinery safety flare system, where required, to control VOC emissions.

Emissions Offsets

In addition, emission offsets are required for newly permitted and modified permitted emission sources by SCAQMD Regulation XIII and/or Regulation XX. Emission offsets are required for all net emission increases associated with stationary sources, thus, complying with state and federal New Source Review requirements and minimizing the impacts associated with emissions from stationary sources. Therefore, emission offsets will be required for net emission increases greater than one pound from stationary sources.

Off-Site Emissions

Off-site emission sources are those that are related to the proposed project, but that would not be directly emitted from permitted equipment at the project site, i.e., trucks, worker commute trips, etc. The operation of the proposed project is not expected to require new workers, but will require 52 additional delivery trucks per year (a maximum of one additional delivery truck in any day). The emission increases associated with the increased off-site emission sources are shown in Table 4-6.

Operational Emissions Summary

Total unmitigated operational emissions from the proposed project are summarized in Table 4-6. Unmitigated operational emissions are further summarized in Table 4-7, which also includes the SCAQMD daily CEQA significance operational thresholds. The operation of the project will exceed the significance threshold for VOC. Therefore, the air quality impacts associated with operational emissions from the proposed project are significant. The VOC emissions are associated with additional fugitive components at the facility and the new storage tank. Tesoro will obtain offsets for the direct VOC emission increases as required by

SCAQMD Rule 1303(b)(2)(A). Because VOC is a precursor to ozone, which is a regional pollutant, the VOC offsets, which are based on an established New Source Review program, will reduce the proposed project net contribution to VOC emissions to 0.2 pounds per day (due to the additional delivery trucks), which is less than significant. The proposed project emissions for CO, NOx, SOx, PM10 and PM2.5 are less than significant. Further, as shown in Table 4-6, the proposed project is expected to result in overall reductions in emissions of CO, NOx, SOx, PM10 and PM2.5, providing beneficial impacts to air quality.

TABLE 4-7

Tesoro Refinery
Stationary Source Operational Emissions Summary for the Proposed Project
(lbs/day)

Sources	CO	VOC	NOx	SOx	PM10	PM2.5[1]
Significance Determination for Facility RECLAIM Pollutants						
Unmitigated Project Emissions[1]	--	--	~~-912.8~~ *-854.6*	-826.0	--	--
Projected Facility Emissions[2]	--	--	4,486	2,127	--	--
Post-Project Facility-Wide 2011 Emissions	--	--	~~3,573.4~~ *3,631.4*	1,301.0	--	--
2-Year Average + Significance Threshold[3]	--	--	**4,541**	**2,276**	--	--
Significant?	--	--	**NO**	**NO**	--	--
Significance Determination for All Project Non-Facility-Wide Pollutants						
Project Emissions	~~-1912.3~~ *-1839.1*	262.8	--	--	-169.6	-169.1
Unmitigated Significance Thresholds	**550**	**55**	--	--	**150**	**55**
Significant?	**NO**	**YES**	--	--	**NO**	**NO**
Emissions Following Rule 1303 Offsets	~~-1912.3~~ *-1839.1*	0.2[4]	--	--	-169.6	-169.1
Significant Following Mitigation?	**NO**	**NO**	--	--	**NO**	**NO**

(1) See Table 4-6.
(2) See Table 3-3 converting tons per year to pounds per day.
(3) See Table 4-2.
(4) Emissions mitigated with emission offsets for stationary sources.

4.2.2.3 Impacts to Ambient Air Quality

Table 4-7 describes the potential emission increases and reductions associated with the proposed project. The proposed project will result in emission decreases from replacing older less efficient equipment. Therefore, following completion of the construction phase, the proposed project is expected to provide an overall beneficial impact to air quality. For this reason, a localized air quality impact analysis is not required.

4.2.2.4 CO Hotspots

The potential for localized high concentrations of CO emissions associated with truck/vehicle traffic was considered and evaluated per the requirements of the SCAQMD CEQA Air Quality Handbook (SCAQMD, 1993). The Handbook indicates that any project that could negatively impact levels of service at local intersections may create a CO hot spot and should be evaluated. As described in Section 4.4.2, there are no local intersections that are expected to have a negative impact on levels of service by the proposed project during construction or operations. Therefore, no CO hot spot analysis is necessary.

4.2.2.5 Toxic Air Contaminants

A health risk assessment (HRA) was performed to determine if emissions of TACs generated by the operation of the proposed project would exceed the SCAQMD thresholds of significance for cancer risk and hazard indices and is included as Volume II of this EIR. The modifications at the SRP are not expected to result in a change in TAC emissions. Therefore, the following subsections outline the HRA prepared for the modifications to the Refinery only. The results of the HRA will be used to evaluate the impacts of TACs from the proposed project. The HRA summarized herein for the proposed project evaluates only the emission increases from the proposed project. The health risk associated with the equipment that is being replaced (i.e., Cogens A and B, and boilers) was previously included in the SCAQMD-approved AB2588 HRA for the facility. The health risks from the AB2588 HRA are used to identify the health risk decreases from the replaced equipment. The combination of the proposed project increases and the decreases from the replaced equipment provides the overall proposed project TAC impacts.

HRA Methodology

The HRA has been prepared in accordance with the August 2003 Office of Environmental Health Hazard Assessment (OEHHA) Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments (OEHHA, 2003) and the October 2003 Air Resources Board Recommended Interim Risk Management Policy for Inhalation-based Residential Cancer Risk memo (CARB/OEHHA, 2003). The HRA includes a comprehensive analysis of the dispersion of certain AB2588-listed compounds into the environment, the potential for human exposure, and a quantitative assessment of individual health risks associated with the predicted levels of exposure. The CARB Hotspots Analysis Reporting Program (HARP) model is the most appropriate model for determining the air quality impacts from the proposed project (CARB, 2008). The HARP model is well suited for refinery modeling since it can accommodate multiple sources and receptors. The HARP model combines the ISCST3 dispersion model with a risk calculation model based on the Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA, 2003). The model default values were modified to conform to the SCAQMD Supplemental Guidelines for Preparing Risk Assessment for AB2588 (SCAQMD, 2005).

Hazard Identification

The operation of the Refinery generates various air contaminants. Some of these chemical compounds are potentially carcinogenic, toxic, or hazardous, depending on concentration or duration of exposure. Numerous federal, state, and local regulatory agencies have developed lists of TACs. The list of potentially-emitted substances considered in the preparation of the HRA for the proposed project is identified in Appendix A-I of the CARB AB2588 guidelines report. The AB2588 TACs emitted from the proposed project are shown in Table 4-8. Some of these pollutants were consolidated into one category, e.g., polycyclic aromatic hydrocarbons (PAHs). Health effects data are not available for all compounds. Therefore, a total of 36 TACs were included in the air dispersion modeling (see Table 4-8). For carcinogens, slope factors were used to compute cancer risk through inhalation. If the carcinogen is a multi-pathway pollutant, a potency slope was used to estimate the risk from non-inhalation pathways. For non-cancer health effects, reference exposure levels (REL) and acceptable oral doses (for multi-pathway pollutants) were used. The non-carcinogenic hazard indices were computed for chronic and acute exposures with their respective toxicological endpoints shown.

Emission Estimations and Sources

Emission rates for the proposed project are shown in Table 4-8. The emission rates for each source are provided in Appendix A of Volume II. Emission rates are based on operating 24 hours per day and 365 days per year, except the Cogen *C* and ~~Backup Generator~~ e*mergency I.C. engine*, which are based on 8,736 hours (24 hours of shutdown) and 200 hours of annual operation, respectively. No change in TAC emissions are expected at the SRP as a result of the proposed project because the proposed modifications include piping for oxygen and there will be no increase in fuel combustion.

VOC emission factors for fugitive components installed in conjunction with the proposed project were based on the SCAQMD's latest guidelines for fugitive components, assuming the use of BACT and an inspection and monitoring program (SCAQMD, 1999). Speciation of VOC emissions was derived from speciation data used by the Refinery for annual emissions reporting and AB2588 reporting. Combustion source emissions are calculated based on fuel feed rate and standard emission factors or emission factor guarantees provided by the manufacturer. Fugitive emissions from the Crude Tank were calculated using the TANKS 4.09d model.

Carcinogenic Health Impacts

Maximum Exposed Individual Worker (MEIW)

The cancer risk estimates for the MEIW are shown in Table 4-9. The project MEIW location is shown in Figure 4-1. Based on the air quality modeling and related assumptions, consistent with SCAQMD HRA policy, the cancer risk to the MEIW associated with the proposed project at the Refinery was calculated to be 3.14×10^{-6} or 3.1 in one million. This result does not exceed the cancer risk CEQA significance threshold of 10 per one million

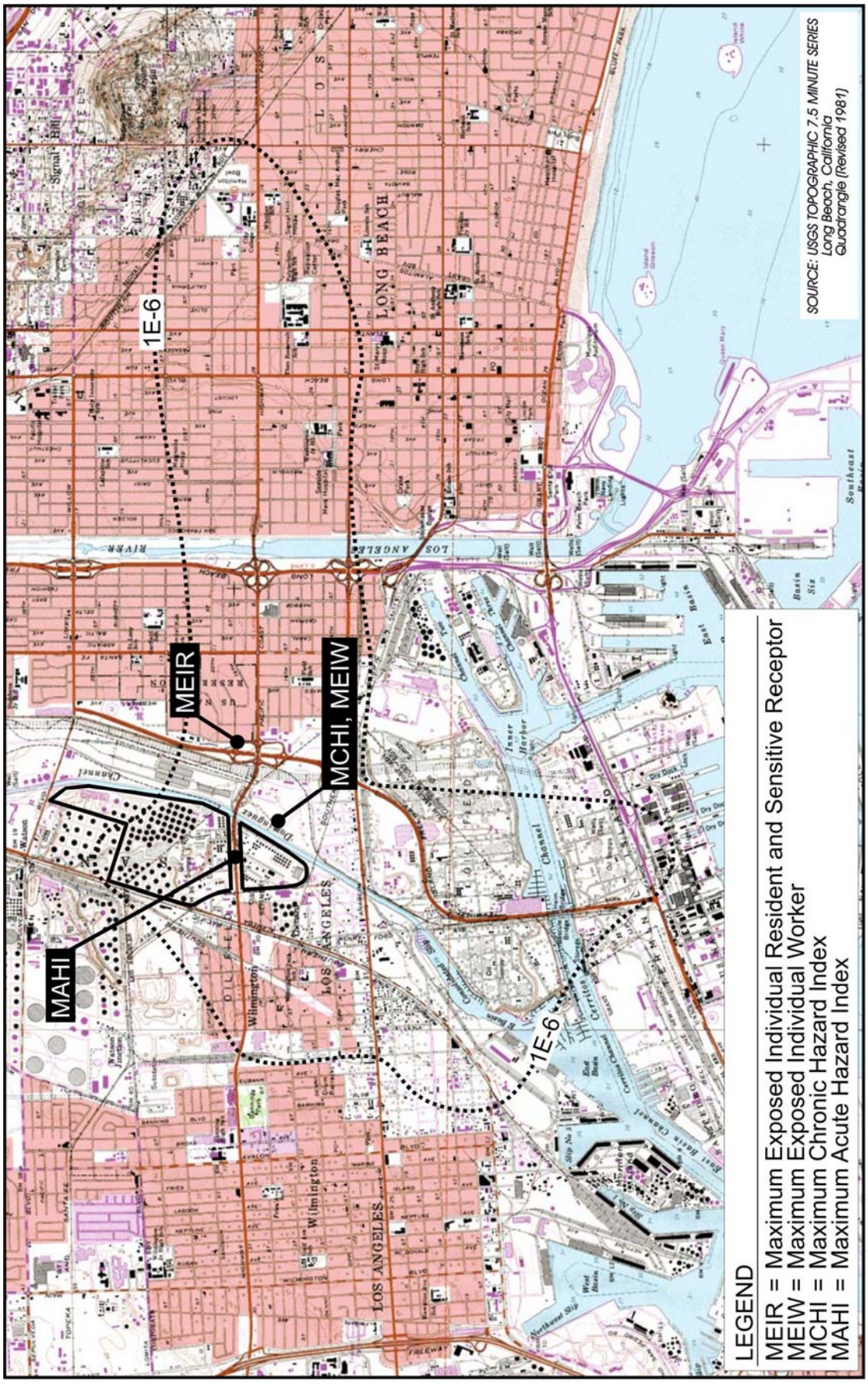
TABLE 4-8

Maximum Refinery TAC Emissions Rates For Proposed Project[1]

CHEMICAL	Proposed Project	
	Emissions (lbs/hr)	Emissions (lbs/yr)
1,2,4-Trimethylbenzene[2]	1.69E-03	1.48E+01
1,3-Butadiene	2.75E-02	1.03E+02
Acetaldehyde	7.71E-02	1.77E+02
Acrolein	6.11E-03	3.19E+01
Ammonia	5.34E+00	1.76E+04
Arsenic	1.19E-04	2.38E-02
Benz[a]anthracene	9.99E-15	8.75E-11
Benzene	2.13E-02	6.80E+01
Benzo[a]pyrene	1.51E-11	1.33E-07
Benzo[b]fluoranthene	4.00E-05	3.51E-01
Cadmium	1.12E-04	2.29E-02
Chromium (VI)	7.43E-06	1.49E-03
Chrysene	2.42E-05	2.12E-01
Copper	3.05E-04	6.09E-02
Cumene	2.88E-04	2.52E+00
Cyclohexane	1.82E-03	1.60E+01
Dibenzo[a,h]pyrene	4.55E-19	3.98E-15
Diesel Exhaust Particulate Matter	2.49E+00	4.98E+02
Ethyl Benzene	2.05E-02	1.72E+02
Ethylene	5.25E-01	4.60E+03
Formaldehyde	4.53E-01	2.86E+03
Hexane	2.60E-02	2.28E+02
Hydrogen Chloride	1.38E-02	2.77E+00
Hydrogen Sulfide	2.04E-01	1.79E+03
Indeno[1,2,3-cd]pyrene	3.43E-04	3.01E+00
Lead	6.17E-04	1.23E-01
Manganese	2.30E-04	4.61E-02
Mercury	1.49E-04	2.97E-02
Naphthalene	2.43E-03	8.74E+00
Nickel	2.90E-04	5.80E-02
PAHs	3.17E-03	4.69E+00
Phenol	4.23E-03	3.71E+01
Propylene	3.77E-01	3.30E+03
Propylene Oxide	1.32E-02	1.15E+02
Selenium	1.64E-04	3.27E-02
Toluene	7.76E-02	6.12E+02
Xylenes (mixed)	4.16E-02	3.37E+02

(1) Emissions include on new and modified equipment, emission reductions from replaced equipment not deducted.

(2) No health effects data available; therefore, not modeled.



ONE IN A MILLION ISOPLETH & MAXIMUM IMPACT POINTS
TESORO RELIABILITY IMPROVEMENT AND REGULATORY COMPLIANCE PROJECT
HEALTH RISK ASSESSMENT

Figure 4-1

Project No. 2550
N:\2550\HRA\Radius of Influence (ver.3).cdr

(see Table 4-1); therefore, the carcinogenic impacts to the MEIW associated with the exposure to TACs from the proposed project are less than significant. Consistent with SCAQMD HRA policy, the MEIW is based on a 40-year exposure period. Workers are assumed to be exposed for eight hours per day, five days per week, 49 weeks per year, for 40 years.

Maximum Exposed Individual Resident (MEIR)

The cancer risk estimates for the MEIR are shown in Table 4-9. The project MEIR location is shown in Figure 4-1. Based on the air quality modeling and related assumptions consistent with SCAQMD HRA policy, based on 70 year exposure, the cancer risk to the MEIR associated with the proposed project at the Refinery was calculated to be 6.76×10^{-6} or 6.7 in one million. This result does not exceed the cancer risk CEQA significance threshold of 10 per one million (10×10^{-6}) (see Table 4-1); therefore, the carcinogenic impacts to the MEIR associated with exposure to TACs from the proposed project are less than significant.

TABLE 4-9

Summary of Proposed Project Cancer Risk

EXPOSURE PATHWAY	Maximum Exposed Individual Worker	Maximum Exposed Individual Resident
New and Modified Equipment		
Inhalation	2.60×10^{-6}	5.56×10^{-6}
Dermal	~~2.60×10^{-6}~~ *5.07×10^{-7}*	~~5.62×10^{-6}~~ 5.62×10^{-7}
Soil Ingestion	6.68×10^{-8}	8.63×10^{-8}
Oral		
Ingestion of Home Grown Produce	0.00×10^{0}	7.06×10^{-7}
Ingestion of Animal Products	0.00×10^{0}	0.00×10^{0}
Ingestion of Mother's Milk	0.00×10^{0}	0.00×10^{0}
Cancer Risk Subtotal for New and Modified Equipment	**3.18×10^{-6}**	**6.92×10^{-6}**
Cancer Risk from Replaced Equipment	**-0.04×10^{-6}**	**-0.16×10^{-6}**
Proposed Project Cancer Risk	**3.14×10^{-6}**	**6.76×10^{-6}**
SCAQMD CEQA Significance Threshold	**10×10^{-6}**	**10×10^{-6}**
Significant?	**NO**	**NO**

Cancer Burden

A one per million isopleth is used in the HARP model as a study area to calculate excess cancer burden. The excess cancer burden for the census blocks within the one per million isopleth was calculated by multiplying the predicted 70-year lifetime risk at the census blocks with the residential population within the respective census block. The calculated cancer burden from the proposed project is 0.091, which is less than the cancer burden CEQA significance threshold of 0.5 (see Volume II for further detail).

Sensitive Receptors

Other types of sensitive receptors, in addition to residences, include schools, daycare facilities, and hospitals. The maximum incremental cancer risk increase for a sensitive receptor is 6.76×10^{-6}, which is less than the cancer risk threshold of 10×10^{-6}. This occurs at Bethune Mary School, which is located about 0.43 mile east of the Refinery. This receptor is also considered the maximum residential receptor.

Non-Carcinogenic Health Impacts

In the analyses of non-carcinogenic health effects, it is generally assumed that a threshold exists below which no health impacts are expected. The substances evaluated can produce health effects due to acute or chronic exposures, although the concentration required to produce such effects may vary greatly depending on the compound.

The types of non-cancer health effects resulting from exposure to compounds vary according to the substance, the magnitude of exposure, and the period of exposure. These health effects generally can be classified into acute exposures (short-term exposures, generally hourly exposures) and chronic exposures (long-term exposures, generally years). Health effects from exposure to non-carcinogenic emissions include birth and reproductive defects, genetic defects, etc.

Maximum Acute Hazard Index (MAHI)

The highest acute hazard index for the proposed project is estimated to be 0.508 from new and modified equipment for the central nervous system. The acute health effects are based on maximum hourly emissions of TACs that have acute target endpoints. (See Volume II for further details.) The acute hazard index for the proposed project does not exceed the CEQA significance threshold of 1.0 in Table 4-1; therefore, no significant adverse acute health impacts are expected. The maximum acute hazard index is located along the Refinery property line adjacent to Pacific Coast Highway, which bisects the Refinery (see Figure 4-1). The MAHI is based on new and modified equipment only and has not been adjusted to account for the reduction from the replaced equipment.

Maximum Chronic Hazard Index (MCHI)

The highest chronic hazard index for the proposed project is estimated to be 0.0846 for the respiratory system. (See Volume II for further details.) The chronic hazard index for the proposed project does not exceed the relevant significance threshold of 1.0 in Table 4-1; therefore, no significant adverse chronic health impacts are expected. The maximum chronic hazard index location is approximately 0.12 mile east of the Refinery northeast of the MEIW (see Figure 4-1). The MCHI is based on new and modified equipment only and has not been adjusted to account for the reduction from the replaced equipment.

4.2.2.6 Summary of Health Impacts

Criteria Pollutants

The primary health effects associated with exposure to NO_2, CO, PM10, and PM2.5 are respiratory impacts including decreased lung function, aggravation of chronic respiratory conditions, and aggravation of heart disease conditions.

Additionally, epidemiological analyses have consistently linked air pollution, especially PM, with excess mortality and morbidity. Health studies have shown both short-term and long-term exposures of ambient PM concentrations are directly associated with increased mortality and morbidity. To estimate potential air quality impacts from a particular facility, the ISCST3 model can be used to provide PM10 concentration levels at a set of receptor points. A concentration-response equation can be calculated on the modeled air quality impacts and changes in mortality to determine the relative change in mortality associated with the estimated changes in annual PM levels and estimate the potential for health impacts. For this calculation, it is assumed that all the PM10 is PM2.5. The log-linear form of the concentration response equation is:

$$\Delta \text{ Mortality} = y_0 (e^{\beta \Delta PM} - 1) * \text{population}$$

where

y_0 = county level all cause annual death rate per person for ages 30 and older,

β = PM2.5 coefficient from health study,

ΔPM = change in annual mean PM2.5 concentration, and

Population = population of ages 30 and older.

The resulting change in mortality cases in a population age group living in a specific location with a given change in PM can be calculated. By applying the census tract level for all census tracts within the modeling domain, the overall estimate in the mortality change is expected to result from PM emissions from the facility.

In order to evaluate the health impacts associated with construction emissions, a LST analysis was also completed. The LST analysis modeled the peak onsite construction

emissions to determine the groundlevel concentrations. The results of the LST analysis indicated that the short-term construction emissions would be below the applicable LST criteria. The LST significance criteria are based on the most stringent ambient air quality standard for NO_2 and CO, and exceedence of a Rule 403-equivalent threshold for PM10 and PM2.5. Use of the ambient air quality standards for NO_2 and CO is appropriate because these standards are based on health effects (see Table 3-1). Since construction of the proposed project is short-term and would not exceed the LST significance criteria for ambient air quality impacts for NO_2, CO, PM10, and PM2.5, no significant adverse health impacts associated with construction emissions are expected. No such adverse health impacts are expected during the construction phase of the proposed project.

Operation of the proposed project will result in operational emission decreases of NO_2, CO, SO_2, PM10, and PM2.5. The proposed project does not contribute to the degradation of the ambient air quality. Therefore, health impacts associated with criteria pollutants from the operation of the proposed project are expected to be less than significant. The proposed project is not expected to contribute to an exceedence of the ambient air quality standards so no such adverse health impacts are expected due to the operation of the proposed project. Additionally, the aforementioned modeling procedure for morbidity and mortality is not required and, thus, no increases in morbidity or mortality rates or related health effects are anticipated.

Although this methodology has been applied by CARB to estimate numbers of premature deaths that may occur statewide from exposure to fine PM, the methodology has not been peer-reviewed or approved for application to relatively small projects at the local level (CARB, 2008a). Until a final PM morbidity/mortality methodology is adopted by CARB, any application of the concentration response to estimate premature mortality from relatively small projects at the local level remains speculative.

The indirect PM emissions associated with the proposed project are limited to an increase of one truck per day associated with additional deliveries to the Refinery. The emissions from trucks will be dispersed throughout the district and will not result in localized impacts. Therefore, no significant air quality or related health impacts are expected due to the proposed project.

Toxic Air Contaminants

The long-term air quality impacts from exposure to TAC were evaluated through the preparation of an HRA. The HRA evaluated the emissions associated with the operation of the proposed project and compared them to carcinogenic and non-carcinogenic significance thresholds to determine potential health impacts. As demonstrated in the HRA, the carcinogenic and non-carcinogenic impacts for all receptors are expected to be less than the significance thresholds. Therefore, no significant adverse carcinogenic or non-carcinogenic health impacts associated with the operation of the proposed project are expected.

4.2.3 MITIGATION MEASURES

Mitigation measures are required, if feasible, to minimize the significant air quality impacts associated with the construction phase of the proposed project since the quantity of NOx emissions are considered significant.

4.2.3.1 Construction Mitigation Measures

The proposed project is expected to have significant adverse air quality impacts due to NOx emissions during the construction phase. Therefore, the following mitigation measures will be imposed on the project to reduce NOx emissions associated with construction activities from heavy construction equipment and worker travel.

On-Road Mobile Sources:

A-1 Develop a Construction Emission Management Plan for the proposed project. The Plan shall include measures to minimize emissions from vehicles including, but not limited to consolidating truck deliveries, prohibiting truck idling in excess of five minutes, description of truck routing, description of deliveries including hours of delivery, description of entry/exit points, locations of parking, and construction schedule.

Off-Road Mobile Sources:

A-2 Prohibit construction equipment from idling longer than five minutes at the Refinery and SRP.

A-3 Use electricity or alternate fuels for on-site mobile equipment instead of diesel equipment to the extent feasible. The project has incorporated this measure to the extent predictable, but will continue to implement where opportunities arise.

A-4 Tune-up construction equipment and maintain a two- to four-degree retard diesel engine timing.

A-5 Use electric welders instead of gas or diesel welders in portions of the Refinery and SRP where electricity is available. The project has incorporated this measure to the extent predictable, but will continue to implement where opportunities arise.

A-6 Use on-site electricity rather than temporary power generators in portions of the Refinery and SRP where electricity is available.

A-7 Prior to construction, the project applicant will retrofit cranes rated at 200 hp and greater with diesel particulate filters to reduce PM10 emissions. In addition, the project applicant will evaluate the feasibility of retrofitting the

off-road construction equipment rated from 50 to 200 hp that will be operating for significant periods. Retrofit technologies such as selective catalytic reduction, oxidation catalysts, air enhancement technologies, etc., will be evaluated. Such technologies will be required if they are commercially available and can feasibly be retrofitted onto construction equipment.

A-8 Suspend all construction activities that generate air pollutant emissions during first stage smog alerts.

4.2.3.2 Operational Mitigation Measures

During the operational phase, all emissions were determined to be less than significant, except for VOC emissions. VOC emissions will be mitigated through offsets required for stationary sources pursuant to SCAQMD Rule 1303. The offsets are based on an established New Source Review program. Operational VOC emissions from the proposed project that do not require offsets are from mobile source emissions (0.2 lbs/day), which alone are less than significant. Therefore, VOC emissions are less than significant because of offset requirements in SCAQMD Rule 1303.

4.2.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Construction emissions for the proposed project for NOx are expected to remain significant following mitigation. The construction emissions associated with CO, VOC, SOx, PM10 and PM2.5 are less than significant and, therefore, mitigation is not required. Construction emissions are expected to be short-term and they will be eliminated following completion of the construction phase.

The mitigation measures are expected to result in additional emission reductions and reduce the potentially significant adverse impacts associated with NOx emissions; however, sufficient emission reductions are not expected to reduce the significant NOx emissions to less than significant. CO, VOC, SOx, PM10, and PM2.5 emissions would remain less than significant.

Localized significant impacts from construction activities were analyzed for NO_2, CO, PM10, and PM2.5. The construction activities associated with the proposed project are not expected to cause a significant adverse localized air quality impact to nearby sensitive receptors and no mitigation would be required. The analysis concluded that construction emissions of NO_2, CO, PM10 and PM2.5 would not exceed applicable LSTs (Table 4-1).

The operational impacts of the proposed project exceed the applicable VOC significance threshold and, therefore, generate significant VOC impacts. The proposed project is not expected to generate significant CO, NOx, SOx, PM10, or PM2.5 impacts during operation. An increase in VOC emissions is required to be offset for stationary sources pursuant to SCAQMD Rule 1303. The VOC offsets will reduce the proposed project's net VOC emissions to 0.2 pounds per day emitted by the one additional delivery truck, which is less

than significant. Therefore, after complying with SCAQMD Rule 1303, the proposed project is not expected to cause a potentially significant adverse VOC impact on air quality.

Other than VOCs, the proposed project will reduce criteria pollutant emissions during operation. Therefore, the operation of the proposed project is not expected to cause a significant adverse impact on ambient air quality.

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

4.3 HAZARDS AND HAZARDOUS MATERIALS

The NOP/IS (see Appendix A) determined that the proposed project at the Refinery and SRP has the potential to generate significant adverse hazards and hazardous materials impacts. The hazard and hazardous materials impacts associated with the operation of the proposed project are potentially significant and the impacts are evaluated in this section.

4.3.1 SIGNIFICANCE CRITERIA

The impacts associated with hazards and hazardous materials will be considered significant if any of the following occur:

- Non-compliance with any applicable design code or regulation.
- Non-conformance to National Fire Protection Association standards.
- Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.
- Greater exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.
- Greater exposure to radiant heat exposures in excess of 1,600 British Thermal Units per hour per square foot (Btu/hr-ft^2) (the level that creates second degree burns on unprotected skin).
- Greater overpressure exposure that exceeds one pound per square inch gauge (psig) (the level that would result in partial demolition of houses).

- Flash fire hazard zones that exceed the lower flammable limit (LFL) (the level that would result in a flash fire in the event a flammable vapor cloud was ignited).

4.3.2 ENVIRONMENTAL IMPACTS

A hazard analysis was conducted for the proposed new and modified units, which is summarized in Table 4-10. The details of the hazard analysis are included in Appendix D.

Table 4-10 lists the potential hazards (fires, explosion overpressure, thermal radiation, release of ammonia or release of H_2S) from the new or modified units associated with the proposed project and the results of the modeling for these hazards. The modeling evaluates the impact of the release regardless of the cause (e.g., breakdown, human error, terrorism, etc.) Hazard impact results are shown for existing equipment, modified equipment, and new equipment. For each potential release, the distance to the significance threshold level was determined before and after the proposed project modifications (where applicable). For new units, the distance to the threshold level for each release was determined. Most of the proposed modifications do not affect the size or the location of the largest potential release for the specific unit. In other words, most of the potential releases that would result in the largest hazard zones already exist for many of the units.

With the maximum hazard zones defined for each release, the units can be divided into three categories dependent on their potential to adversely affect the public. The categories are defined as follows:

- **Units with No Potential Existing or Post-Project Off-Site Impacts** (i.e., no new hazard zones would be generated): The process units that fall into this category include the new Steam Boilers, the new Fuel Gas Treatment Unit, the new Aqueous Ammonia Storage Tank, the HCU Modification, the HTU Modification, the DCU Modification, the new Coke Handling, Screening and Loading System, and Connecting Atmospheric Pressure Relief Devices to the Flare.

- **Units with Potential Off-Site Impacts Greater than Existing Impacts** (i.e., the post-project impacts are larger than the existing impacts so that impacts have the potential to migrate off-site): The units that fall into this category include the Amine/Sour Water Reliability Upgrades, new Crude Oil Storage Tank, and the SRP modifications(see Table 4-10).

- **Units with Potential Existing or Post-Project Off-Site Impacts, But Post-Project Impacts Are Less Than or Equal to Existing Impacts:** The process units that fall into this category include the new Cogeneration Unit, new Aqueous Ammonia Tank, and the FCCU Unit modifications (see Table 4-10).

The details of the analysis are included in Appendix D. The proposed project will reduce the potential hazard impacts associated with the Cogeneration Unit. A flash fire from the HCU and the HTU will have slightly larger distances (640 versus 680 feet and 680 versus 730 feet,

TABLE 4-10

Maximum Hazard Distances for Maximum Credible Event in Each Process Unit/Area

Process Unit/ Area	Status of Potential Hazard (E) Existing (M) Modified (N) New	Maximum Distance (ft) from Center of Unit to				
		Flash Fire (LFL)	Explosion Overpressure (psig)	Pool/Torch Fire Thermal Radiation ($Btu/hrAft^2$)	BLEVE Radiation ($Btu/hrAft^2$)	NH_3/H_2S Gas Concentration
			1.0	1,600.	1,600.	150/30 ppm
COGEN	E	--	--	--	--	780
	M	--	--	--	--	35
BOILERS	E	--	165	--	--	--
	M	--	170	--	--	--
FGTU	E	110	--	--	--	--
	N	110	--	--	--	--
NH3	E	--	--	--	--	3,940
	N	--	--	--	--	340
HCU	E	640	--	--	--	--
	M	680	--	--	--	--
FCCU	E	540	--	--	--	--
	M	560	--	--	--	--
HTU-2	E	680	--	--	--	--
	M	730	--	--	--	--
ASW	E	--	--	--	--	1,840
	M	--	--	--	--	1,950*
CDBS	E	--	--	90	--	--
	M	--	--	95	--	--
TANK	E	--	--	220	--	--
	N	--	--	400*	--	--
SRP	E	--	--	--	--	2,430
	M	--	--	--	--	2,730*

* = potentially significant impact

Nomenclature:

COGEN	Cogeneration Units
BOILERS	Boilers
FGTU	Fuel Gas Treatment Unit
NH3	E = Existing Anhydrous Ammonia Tank, M = New Aqueous Ammonia Tank
HCU	Hydrocracking Unit
FCCU	Fluid Catalytic Cracking Unit(1.3.2.3)
HTU-2	Hydrotreating Unit #2
ASW	Amine/Sour Water Unit
CDBS	Coke Drum Blowdown System
TANK	New Crude Oil Tank (TK-500001)
SRP	Sulfur Recovery Plant

respectively) but these releases would remain within the confines of the Refinery. The modifications to the DCU and new Boilers are also not expected to create any new hazards that would go off-site. The potential flash fire hazards associated with the Fuel Gas Treatment Unit are expected to remain within the confines of the Refinery. The modifications to the FCCU would generate a slightly larger (540 versus 560 feet) potential flash fire, but would not create an appreciable change in the offsite industrial impact from that which already exists.

The Amine/Sour Water Upgrades and the new Crude Oil Storage Tank have the ability to create a hazard that could extend off-site. Upgrades to the Amine/Sour Water Unit would result in an increase in the distance that exposure to H_2S could extend offsite. The new Crude Oil Storage Tank would result in an increased distance that a pool/torch fire could extend offsite. In addition, the SRP modifications have the ability to create a larger toxic vapor cloud of H_2S (2,430 versus 2,730 feet), which would extend offsite but would remain in an industrial area. Therefore, the potential hazard impacts associated with the proposed project are considered to be significant because there is the potential for some sensitive receptors to be exposed to the potential hazards that exceed the significance thresholds for H_2S and fire hazards.

The hazards associated with the use of ammonia will be decreased by the proposed project. The existing hazards associated with a release from an existing anhydrous ammonia storage tank are estimated to travel a maximum of about 3,940 feet. The proposed project includes replacing the use of anhydrous ammonia with aqueous ammonia at the new Cogeneration Unit (Cogen C). The potential ammonia hazards associated with the aqueous ammonia tank are limited to 340 feet from the tank, which pose no new off-site hazard from ammonia storage. The hazards associated with a release from an ammonia line at the new Cogeneration Unit (Cogen C) will decrease from 780 feet for anhydrous ammonia from existing Cogens A and B to 35 feet for aqueous ammonia.

Releases from new or modified equipment that result in an increase in the potential off-site exposure (based on the consequence modeling and the given hazard endpoints), do so only under “worst-case” conditions. For the “worst-case” scenarios evaluated to occur, the following conditions must be met: (1) a full rupture of the line occurs; (2) the release does not ignite within minutes of the rupture; (3) the wind speed is low (less than three miles per hour); and (4) the atmosphere is calm. The "worst-case" scenario is highly unlikely and only results in an off-site hazard (toxic or flammable vapor dispersion) for a limited number of potential releases.

Operation of the proposed project will not involve the use of flammable substances or hazardous materials that are not currently used at the Refinery and SRP nor will it involve the use of flammable substances in locations where they are not currently used. Further, the proposed project will phase out the use of anhydrous ammonia at the existing Cogeneration Unit (Cogens A and B) and replace it with aqueous ammonia for the new Cogeneration Unit (Cogen C), thus, reducing hazards at the Cogeneration Unit and to the surrounding community.

Regulatory Compliance

The proposed project modifications will require compliance with various regulations, including OSHA regulations (29 CFR Part 1910) that require the preparation of a fire prevention plan, and 20 CFR Part 1910 and Title 8 of the CCR that require prevention programs to protect workers that handle toxic, flammable, reactive, or explosive materials.

Section 112 (r) of the Clean Air Act Amendments of 1990 [42 U.S.C. 7401 et. Seq.] and Article 2, Chapter 6.95 of the California Health and Safety Code require facilities that handle listed regulated substances to develop Risk Management Programs (RMPs) to prevent accidental releases of these substances. Tesoro has prepared an RMP for the existing Refinery and SRP which may need to be revised to incorporate the changes associated with the proposed project. The Hazardous Materials Transportation Act is the federal legislation that regulates transportation of hazardous materials.

Under federal OSHA, regulations have been promulgated that require the preparation and implementation of a Process Safety Management Program (PSM) (40 CFR Part 1910, Section 119, and Title 8, CCR, Section 5189). A PSM that meets the requirements of the regulations and is appropriately implemented is intended to prevent or minimize the consequences of a release involving a toxic, reactive, flammable, or explosive chemical. The primary components of a PSM include written safety information; performance of process safety analysis; detailed operating procedures; training; and pre-start up safety review for new and modified facilities.

Tesoro will comply with all applicable design codes and regulations, conform to National Fire Protection Association standards, and conform to policies and procedures concerning leak detection containment and fire protection. Therefore, no significant adverse compliance impacts are expected.

Impacts on Water Quality

A spill of any of the hazardous materials (generally petroleum products and by-products from the refining process) used and stored at the Refinery or SRP could occur under upset conditions, e.g., earthquake, tank rupture, and tank overflow. Spills also could occur from corrosion of containers, piping, and process equipment; and leaks from seals or gaskets at pumps and flanges. A major earthquake would be a potential cause of a large spill or release. Other causes could include human or mechanical error or deliberate human action such as terrorism. Construction of the vessels and foundations in accordance with the Uniform Building Code Zone 4 requirements helps structures to resist major earthquakes without collapse, but result in some structural and non-structural damage following a major earthquake. The Refinery has emergency spill containment equipment and would implement the spill control measures in the event of an earthquake. Storage tanks are required to have secondary containment capable of containing 110 percent of the contents of the storage tanks. The new crude storage tank will have secondary containment to prevent the release of crude oil off-site in the event of tank failure. Therefore, the rupture of a tank would be collected within the containment system and pumped to an appropriate storage tank.

Spills at the Refinery and SRP would generally be collected within containment facilities. Large spills outside of containment areas at the Refinery and SRP are expected to be captured by the process water system where it would be controlled. Spilled material would be collected and pumped to an appropriate tank, or sent off-site if the spilled material cannot be used on-site. Because of the containment systems in place, spills are not expected to migrate from the Refinery or SRP. Thus potential adverse water quality hazard impacts are considered to be less than significant.

Transportation Hazards

The transportation of hazardous materials can result in offsite releases through accidents or equipment failure. The materials currently transported to and from the Refinery and SRP include sulfur, oxygen, ammonia, and other materials. However, the proposed project is not expected to increase the amount of hazardous materials transported to or from the Refinery since some anhydrous ammonia deliveries will be replaced with aqueous ammonia deliveries. Additional oxygen is expected to be delivered to the SRP but no increase in hazards is expected as oxygen is not considered to be a hazardous substance.

The Refinery receives both anhydrous ammonia and aqueous ammonia from a local ammonia supplier located in the greater Los Angeles area. As is currently the case with existing ammonia deliveries, deliveries of aqueous ammonia would be made to the facility by tanker truck via public roads. Aqueous ammonia is delivered to the Refinery in 6,000 gallon trucks, so the proposed project modifications would not introduce any new transportation hazards.

4.3.3 MITIGATION MEASURES

The proposed project could result in significant adverse impacts associated with "worst-case" hazards in the Amine/Sour Water Unit, the new Crude Oil Storage Tank, and the SRP modifications. Therefore, pursuant to CEQA Guidelines §15126.4, this EIR describes "feasible measures which could minimize significant adverse impacts . . ."

No feasible mitigation measures have been identified, over and above the extensive safety regulations that currently apply to the Refinery and SRP facilities. However, there are a number of rules, regulations, and laws that the Refinery and SRP has complied or must comply with that serve to minimize the potential adverse impacts associated with hazards at the facility and will minimize the hazards associated with the new units. Under federal OSHA, regulations have been promulgated that require the preparation and implementation of a PSM Program (40 CFR Part 1910, Section 119, and Title 8, CCR, Section 5189). RMPs are covered under the California Health and Safety Code Section 25534 and 40 CFR Part 68, and Section 112r, by the Clean Air Act.

A PSM that meets the requirements of the regulations and is appropriately implemented is intended to prevent or minimize the consequences of a release involving a toxic, reactive, flammable, or explosive chemical. A PSM review will be required as part of the proposed project. The primary components of a PSM include the following:

- Compilation of written process safety information to enable the employer and employees to identify and understand the hazards posed by the process;

- Performance of a process safety analysis to determine and evaluate the hazard of the process being analyzed;

- Development of operating procedures that provide clear instructions for safely conducting activities involved in each process identified for analysis;

- Training in the overview of the process and in the operating procedures is required for facility personnel and contractors. The training should emphasize the specific safety and health hazards, procedures, and safe practices; and,

- A pre-start up safety review for new facilities and for modified facilities where a change is made in the process safety information.

An RMP is required for certain chemicals at the Refinery and SRP. The RMP consists of four main parts: hazard assessment that includes an off-site consequence analysis, five-year accident history, prevention program, and emergency response program. The Refinery's and SRP's existing RMP will need to be reviewed and revised to include the new and modified Refinery units, and to ensure that no unexpected or adverse interactions with existing systems occur. Such reviews are required as part of the RMP, CalARP, and PSM programs for covered processed. It is expected that such reviews will take place if the threshold quantities of regulated substances are exceeded in any of the fourteen elements of the proposed project (i.e., Cogeneration Units, Steam Boilers, Fuel Gas Treatment Unit, Aqueous Ammonia Storage Tank, DCU Modification, HCU Modification, FCCU Modification, Coke Handling, Screening and Loading System, HTU Modification, Amine/Sour Water Reliability Upgrades, new Crude Oil Storage Tank, New Sour Gas Treatment Units, Connecting Atmospheric Pressure Relief Devices to the Flare, and the SRP modification.)

4.3.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The impacts of the proposed project on hazards are expected to be significant prior to compliance with PSM, RMP, and CalARP requirements. Hazards associated with ammonia transport, handling and storage are expected to be reduced by phasing out anhydrous ammonia from existing Cogens A and B and using aqueous ammonia for the new Cogen C at the Cogeneration Unit. Compliance with existing regulations and implementation of the recommended safety measures would further minimize the potential impacts associated with a release, but are not expected to eliminate the potential hazard impacts. No feasible mitigation measures were identified to further reduce significant adverse hazard impacts. Therefore, hazards and hazardous material impacts generated by the proposed project are expected to remain significant.

4.4 TRANSPORTATION AND TRAFFIC

The NOP/IS (see Appendix A) determined that the proposed project at the Refinery and SRP has the potential to generate significant adverse transportation and traffic impacts during construction. The traffic impacts associated with the construction phase of the proposed project are potentially significant and the impacts on the transportation system are evaluated in this section. The NOP/IS determined that the proposed project does not have the potential to generate significant adverse transportation and traffic impacts during the operational phase (see Appendix A). Therefore, operational traffic impacts were not evaluated further in this EIR.

4.4.1 SIGNIFICANCE CRITERIA

The proposed impacts on transportation and traffic would be considered significant if the following occurs:

- Peak period levels on major arterials within the vicinity of the proposed project sites are disrupted to a point where intersections with a LOS of C or worse are reduced to the next lower LOS, as a result of the projects for more than one month.
- An intersection's volume to capacity ratio increases by 0.02 (two percent) or more when the LOS is already D, E or F for more than one month.
- A major roadway is closed to all through traffic, and no alternate route is available.
- There is an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.
- The demand for parking facilities is substantially increased.
- Substantial alterations to current circulation or movement patterns of people and goods are induced.
- Water borne, rail car or air traffic is substantially altered.
- Traffic hazards to motor vehicles, bicyclists or pedestrians are substantially increased.

4.4.2 ENVIRONMENTAL IMPACTS

The following evaluates the construction traffic impacts associated with the proposed project. The construction of modifications at the Refinery will create additional traffic from travel by construction workers to and from the site, as well as transportation of materials and equipment to the Refinery. Construction at the SRP is included in the evaluation for the Refinery. The routes traveled to the SRP are the same as those traveled to the Refinery. Therefore, the analysis would be the same. Since Tesoro is uncertain about the start date for

construction activities related to the proposed project, traffic impacts were evaluated based on the potential peak labor force. It was determined that the peak labor force of about 600 workers would be expected for the proposed project. Therefore, traffic impacts were evaluated during the peak traffic day, i.e., peak labor force day. It was determined that peak traffic is expected in month eight of construction, when the construction activities for a number of project components are expected to overlap.

The traffic analysis (see Appendix E) makes worst-case assumptions regarding traffic flow during construction activities in order to provide a worst-case traffic analysis. The LOS analysis assumes 600 construction workers will be commuting to the Refinery during peak construction activities, with all construction workers expected during one shift (7:00 a.m. to 4:00 p.m.). Consequently, construction workers will avoid the morning peak traffic hours (7 to 9 a.m.) as all the workers are expected to be at the site prior to 7 a.m. The proposed project will impact traffic during the evening peak hour (4 to 6 p.m.) as workers are expected to begin leaving the site at about 4 p.m. [Note that the month that has the highest number of construction workers working at the Refinery and SRP is not the month with the highest air emissions. Therefore, the traffic analysis for the peak construction traffic impacts is based on a different number of workers (600) than the air quality analysis for construction emissions (248)].

It is assumed that most of the construction personnel would commute to the site alone in private automobiles even though Tesoro would encourage construction contractor's employees to organize carpools. The traffic analysis assumes that construction personnel and delivery trucks would enter the Refinery via the main Refinery entrance on Pacific Coast Highway as well as the northern Refinery entrance on Sepulveda Boulevard, depending on which portion of the project is being constructed. All construction workers are expected to park on-site. All construction-related traffic at the SRP will enter through the main entrance on Alameda Street and park on-site.

The truck traffic associated with project construction would mainly consist of material deliveries that would be spread throughout the workday with few deliveries occurring during the peak hour since deliveries to the Refinery and SRP are scheduled to avoid the peak hour. Large project-related equipment (e.g., reactors) will be delivered directly to the Refinery or SRP. The traffic analysis assumes all truck deliveries will be sent to the Refinery, in order to provide a worst-case analysis of traffic impacts. Any transport of heavy construction equipment or oversized Refinery or SRP equipment that will require oversized or over weight transport vehicles on state highways will require a Caltrans Transportation permit.

Roadways in the vicinity of the project would be impacted by the project's construction-related traffic. Table 4-11 shows the predicted proposed project LOS analysis and volume-to-capacity ratios due to peak construction activities (see Appendix E for the complete traffic analysis). Table 4-11 indicates that no intersections are expected to show a change in the LOS due to the construction phase of the proposed project. Further, the volume-to-capacity ratio is not expected to increase by more than two percent at any intersection that is currently operating at LOS D or worse. The volume-to-capacity ratio will increase by more than two percent at the Alameda Street/Sepulveda Boulevard Connector, Alameda Street

Connector/Pacific Coast Highway, and Alameda Street/Pacific Coast Highway Connector; however, all three of these intersections are operating at LOS A and are expected to continue to operate at that level. Therefore, no significance adverse traffic impacts are expected due to construction activities associated with the proposed project.

TABLE 4-11

Tesoro Refinery Construction Traffic Impacts Level of Service Analysis and Volume-To-Capacity Ratios

INTERSECTION	BASELINE (1)		IMPACTS		
	P.M. LOS	Peak Hour V/C	P.M. LOS	Peak Hour V/C	Change in V/C
Alameda St. and I-405 NB Ramps	A	0.564	A	0.583	0.019
Alameda St and 223rd St. Connector	A	0.514	A	0.533	0.019
ICTF entry/I-405 Ramps and Wardlow/223rd St.	A	0.497	A	0.497	0.000
Alameda Connector and 223rd St.	C	0.737	C	0.737	0.000
Alameda St. and Sepulveda Blvd. Connector	A	0.446	A	0.469	0.023
Alameda St. Connector and Sepulveda Blvd.	A	0.582	A	0.582	0.000
Alamda St. Connector and Pacific Coast Hwy.	A	0.550	A	0.579	0.029
Alameda St. and Pacific Coast Hwy. Connector	A	0.234	A	0.301	0.068
Alameda St. and Anaheim St.	A	0.566	A	0.570	0.004
Wilmington Ave. and Sepulveda Blvd.	A	0.557	A	0.563	0.004
Santa Fe St. and Pacific Coast Hwy.	D	0.832	D	0.850	0.018

Notes: V/C = Volume-to-capacity ratio (capacity utilization ratio); LOS = Level of Service

The construction phase is not expected to result in an increase or decrease in marine vessel or rail traffic because equipment shipment would not require dedicated marine vessels for delivery and can be accommodated on cargo vessels as part of a routine delivery and rail transport is not anticipated for construction equipment delivery.

The potential impacts of construction-related traffic on the I-710 Freeway were also examined during the morning and evening peak hour. The existing and existing-plus-project freeway conditions are summarized in Table 4-12 for the peak traffic during project construction.

As shown in Table 4-12, construction worker traffic for the proposed project will not cause the LOS to degrade to LOS D. The proposed project may cause an increase of two percent at the I-710 Freeway near the Refinery which is currently operating at LOS D during evening peak hours. The northbound lanes of I-710 Freeway operate at LOS D during the evening peak hour and the proposed project could increase traffic by about 4.2 percent during the construction phase. Therefore, construction worker traffic for the proposed project could result in significant adverse impacts on the I-710 Freeway in the vicinity of the Refinery during project construction.

TABLE 4-12

Peak Proposed Project Traffic Impact on Surrounding I-710 Freeway

Freeway Segment	Dir.	Peak Hour	Freeway Capacity[a]	Existing Conditions		Existing + Project Conditions				
				V/C Ratio	LOS	Project Traffic	Peak Hour Volume	V/C Ratio	LOS	Project Impact
I-710 at Anaheim St.	SB	A.M.	5,400	0.974	E	0	5260	0.974	E	0.000
	NB	P.M.	7,200	0.806	C/D	301	6105	0.848	D	0.042

4.4.3 MITIGATION MEASURES

Feasible mitigation measures are required to address significant traffic impacts on the I-710 Freeway during the construction phase of the proposed project. Because of the temporary nature of the construction traffic, and the inability to change the number of workers needed, feasible mitigation measures are limited.

T-1 Tesoro will schedule the construction work shift to begin at 7:00 a.m. so that traffic impacts during the morning peak hour will be avoided.

T-2 Tesoro will encourage ridesharing to reduce single occupancy vehicle trips as well as encourage public transit use. Preferential parking for rideshare vehicles will be provided for construction workers.

The traffic analysis assumes that no ridesharing will occur, i.e., AVR equals 1.0, and, therefore, provides a worst-case estimate of project impacts. However, ridesharing during construction activities is common and will help decrease traffic impacts. The overall AVR in the Basin averages approximately 1.34. The amount of ridesharing that will occur cannot be predicted so traffic impacts are assumed to remain significant. Because the traffic impacts are limited to impacts on the I-710 Freeway, no other feasible mitigation measures have been identified.

4.4.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The proposed project impacts on local streets are expected to be less than significant. Construction traffic impacts are expected to remain significant for the I-710 Freeway. The construction traffic impacts will cease following completion of the construction phase. As explained in the NOP/IS (see Appendix A), the traffic impacts associated with the operational phase of the proposed project are expected to be less than significant, i.e., the project is only expected to result in an increase of about one delivery truck per week or a maximum of one truck per day.

4.5 GROWTH INDUCING IMPACTS

CEQA defines growth-inducing impacts as those impacts of a proposed project that "could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth" (CEQA Guidelines §15126.2(d)).

The proposed project is not expected to foster population growth in the area, nor will additional housing or infrastructure be required. The project involves the modification of existing industrial facilities. No new services will be required; therefore, no infrastructure development or improvement will be required, and no population growth will be encouraged as a result of the project. It is expected that construction workers necessary to build new, or modify existing equipment will be largely drawn from the existing workforce pool in southern California. Further, operation of the proposed project is not expected to require additional Refinery or SRP workers.

The proposed Refinery and SRP modifications are associated with enhancing safety or optimizing the operation of the existing Refinery and SRP. The proposed project will not cause an increase in crude throughput and is not expected to result in growth-inducing impacts.

4.6 SIGNIFICANT ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED AND SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

CEQA requires an EIR to discuss significant environmental effects (CEQA Guidelines §15126.2(b)) and irreversible environmental changes (CEQA Guidelines §15126.2(c)), which would result from a proposed project, should it be implemented. Significant adverse impacts are impacts that would exceed established threshold levels (e.g., air emissions would exceed SCAQMD established threshold levels). Irreversible changes include a large commitment of nonrenewable resources, committing future generations to specific uses of the environment (e.g., converting open spaces into urban development), or enduring environmental damage due to an accident.

It was determined that implementation of the proposed project would result in potentially significant adverse impacts on air quality during construction and these impacts would remain significant following mitigation. These emissions are temporary and will cease following completion of construction activities. Operational air quality impacts of both criteria pollutants and TACs are not expected to have a significant adverse impact on the environment. Following completion of the construction phase, the proposed project is not expected to result in significant air quality impacts. Therefore, the proposed project is not expected to have long-term adverse environmental impacts on air quality.

The proposed project could result in significant impacts related to the "worst case" hazards associated with modifications to the Refinery and SRP, including the Amine/Sour Water

Reliability Upgrades, the new Crude Oil Storage Tank, and the SRP modifications. There are a number of rules and regulations that the Refinery and SRP must comply with that serve to minimize the potential impacts associated with hazards at the Refinery and SRP.

Traffic levels are expected to increase during construction and generate potentially significant adverse traffic impacts. The proposed project impacts on local streets are expected to be less than significant. Construction traffic impacts are expected to remain significant for the I-710 Freeway even after mitigation. The construction traffic impacts will cease following completion of the construction phase. The traffic impacts associated with the operational phase of the proposed project are expected to be less than significant. No feasible mitigation measures are expected to reduce traffic impacts on the I-710 Freeway to a level of less than significant. Operational traffic levels are expected to remain essentially the same as existing levels. Therefore, no significant adverse impacts for traffic are expected during operation of the proposed project.

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

4.7 ENVIRONMENTAL EFFECTS NOT FOUND TO BE SIGNIFICANT

The environmental effects of the Tesoro Reliability Improvement and Regulatory Compliance Project are identified and discussed in detail in the preceding portions of Chapter 4 of this EIR and in the Initial Study (see Appendix A) per the requirements of the CEQA Guidelines (§15128). The following topics of analysis in this EIR were found to have no potentially significant adverse effects, after mitigation:

Air Quality during project operation

The following topics of analysis were found to have no potentially significant adverse effects in the Initial Study (see Appendix A):

Aesthetics
Agriculture Resources
Biological Resources
Cultural Resources
Energy
Geology/Soils
Hydrology/Water Quality
Land Use/Planning
Mineral Resources
Noise
Population/Housing

Public Services
Recreation
Solid/Hazardous Waste
Transportation/Traffic during project operation

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