4.0 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This chapter provides an assessment of potential environmental impacts associated with the ARCO CARB Phase 3 – MTBE Phase Out Project. Both project construction and project operation impacts to the affected environment of each resource discussed in Chapter 3 are analyzed in this section.

Pursuant to CEQA, this section focuses on those impacts, which are considered potentially significant. An impact has been considered significant if it leads to a "substantial or potentially substantial, adverse change in the environment." Impacts from the project fall within one of the following areas:

No impact - There would be no impact to the identified resource resulting from this project. For example, a project constructed at an existing facility, which has previously been surveyed and found to contain no cultural resources would produce no impact to that resource.

Adverse but not significant - Some impacts may result from the project; however, they are judged not to be significant. 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. For example, removal of a small amount of marginal habitat from a species with a widespread distribution would probably not be a significant impact. Similarly, the addition of an industrial structure within an existing industrial facility complex would probably not produce a significant impact on visual resources.

Potentially significant but mitigatable to insignificance - Significant impacts may occur; however, with proper mitigation, the impacts can be reduced to insignificance. For example, a project affecting traffic flow during construction may have mitigation calling for temporary traffic controls that will keep the impacts to within acceptable limits.

Potentially significant and not mitigatable to insignificance - Impacts may occur that would be significant even after mitigation measures have been applied to lessen their severity. For example, a project could require a considerable amount of water during construction. If the additional water required the commitment of all the reserves of a water district even after requiring the project to include all water conservation practices, the impact to this resource could be significant and not mitigatable to insignificance. Under CEQA, a significant impact would require the preparation of a Statement of Findings and a Statement of Overriding Considerations, i.e., the project benefits outweigh the significant damage to the environment, in order for the project to be approved.

Beneficial - Impacts will have a positive effect on the environment. For example, a project may produce a less polluting form of gasoline.

Mitigation measures for adverse significant impacts are also provided in this chapter. Mitigation measures are methods for minimizing or eliminating the effect of a project on the environment. This chapter also provides suggested mitigation for effects that are temporary in duration and will not have a long-term adverse impact on the environment.

4.1 Air Quality

Project-related air quality impacts calculated in this environmental analysis will be considered significant if any of the significance thresholds in Table 4.1-1 are exceeded. Additionally, operational NO_x or SO_x emissions from stationary sources regulated by Regulation XX-RECLAIM, will be considered significant if calculated project operational NO_x or SO_x emissions (RECLAIM criteria pollutants) plus the facility's Annual Allocation for the year the project becomes operational, including purchased RECLAIM trading credits (RTCs) for that year, are greater than the facility's Initial 1994 RECLAIM Allocation plus nontradeable credits (NTCs), as listed in the RECLAIM Facility Permit, plus the maximum daily operation NO_x and SO_x emissions significance thresholds of 55 and 150 pounds per day, respectively as listed in Table 4.1-1. Since the NO_x and SO_x emissions significance thresholds in the table are expressed in pounds per day, the facility's Initial 1994 RECLAIM Allocation plus NTCs and the facility's Annual Allocation for the year the project becomes operational, including purchased RTCs, have been converted to pounds per day by dividing by 365 days per year. Operational NO_x and SO_x emissions from non-RECLAIM sources will be compared to the 55 and 150 pounds per day significance thresholds, respectively.

This section describes the air quality impacts that are anticipated to be associated with the proposed project. It begins with a discussion of the activities that are anticipated to occur during the construction phase of the proposed project, the resulting estimated on-site and off-site air pollutant emissions, and the potential significance of those emissions. It then continues with a discussion of the potential sources of air pollutant emissions during the operational phase of the proposed project and the estimated net change in emissions from LAR and the terminals. The potential significance of changes in operational criteria pollutant emissions is then evaluated by comparison with emission thresholds, and the potential significance of changes in toxic air contaminant emissions is evaluated through a human health risk assessment. The section concludes with a discussion of measures to mitigate potentially significant construction-related and operational air quality impacts.

4.1.1 Construction Emissions

Construction of the proposed project at LAR is scheduled to begin in February 2001, and be completed in October 2002. Construction is anticipated to take place four days per week, Monday through Thursday, from 6:00 a.m. to 5:00 p.m. Occasional night, Friday, or weekend shifts may be required to maintain the construction schedule. For the most part the construction would occur during process turnarounds when the units would be undergoing scheduled maintenance.

The construction activities at the terminals would occur between June 2001 and December 2002. The maximum duration for construction at an individual terminal would be 12 months. Construction activities would occur Monday through Friday, from 6:00 a.m. to 5:00 p.m. Occasional night or weekend shifts may be required to maintain the construction schedule.

Table 4.1-1
Air Quality Significance Thresholds

Criteria Pollutants Mass Daily Thresholds			
Pollutant	**Construction**	**Operation**	**RECLAIM Pollutants**
NO_x	100 lbs/day	55 lbs/day	10,210 lbs/day
VOC	75 lbs/day	55 lbs/day	
PM_{10}	150 lbs/day	150 lbs/day	
SO_x	150 lbs/day	150 lbs/day	10,299 lbs/day
CO	550 lbs/day	550 lbs/day	
Lead	3 lbs/day	3 lbs/day	

TAC, AHM, and Odor Thresholds	
Toxic Air Contaminants (TACs)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Hazard Index ≥ 1.0 (project increment) Hazard Index ≥ 3.0 (facility-wide)
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402
Ambient Air Quality for Criteria Pollutants	
NO_2 1-hour average annual average	20 μg/m^3 (= 1.0 pphm) 1 μg/m^3 (= 0.05 pphm)
PM_{10} 24-hour annual geometric mean	2.5 μg/m^3 1.0 μg/m^3
Sulfate 24-hour average	1 μg/m^3
CO 1-hour average 8-hour average	1.1 mg/m^3 (= 1.0 ppm) 0.50 mg/m^3 (= 0.45 ppm)
μg/m^3 = microgram per cubic meter; pphm = parts per hundred million; mg/m^3 = milligram per cubic meter; ppm = parts per million; TAC = toxic air contaminant; AHM = Acutely Hazardous Material	

Construction emissions can be distinguished as either on-site or off-site. On-site emissions generated during construction consist of the following:

- Exhaust emissions (NO_X, SO_X, CO, VOC, and PM_{10}) from heavy-duty construction equipment;

- Fugitive dust (PM_{10}) from grading, motor vehicle travel on paved surfaces, storage pile wind erosion, and general material handling (i.e., dropping soil onto the ground or into trucks during excavation);
- VOC from asphaltic paving; and
- VOC from architectural coating.

Off-site emissions during the construction phase normally consist of exhaust emissions and entrained paved road dust from worker commute trips and material delivery trips to the construction site.

Construction is anticipated to include the following:

1. Modifications to Light Hydro Unit No. 1
2. Conversion of the ISO SIV unit to Light Hydro Unit #2
3. Modifications to the No. 3 Reformer Fractionator
4. Conversion of the No. 1 Naphtha Splitter to a new debutanizer and conversion of the Super Fractionation Integrated Area (SFIA) Depentanizer to a naptha splitter
5. Construction of a new FCCU Rerun Bottoms Splitter
6. Addition of new equipment to the North Hydrogen Plant
7. Conversion of the MTBE unit to an ISO Octene unit
8. Modification of the Cat Poly unit to a Dimerization Unit
9. Modification of the Mid-Barrel unit to a gasoline hydrotreater
10. Modifications to Tank Farm piping
11. Construction of facilities and equipment for pentane off-loading at the Railcar Pentane Loading facility
12. Modifications to transport pentanes by pipeline
13. Construction of facilities for butane loading and off-loading at the railcar polypropylene loading facility
14. Modifications at Marine Terminal 2 for marine tanker ethanol offloading and storage
15. Modifications at Marine Terminal 2 for Pentanes storage and marine tanker loading
16. Modifications at the East Hynes terminal for ethanol storage and blending
17. Modifications at the Vinvale terminal for ethanol storage and blending
18. Modifications at the Hathaway terminal for ethanol storage, blending and shipping by tanker truck

19. Modifications at the Carson terminal for ethanol storage and blending
20. Modifications at the Colton terminal for ethanol storage and blending

Emissions from these activities were estimated using anticipated construction equipment requirements along with the following emission estimating techniques:

- SCAQMD CEQA Air Quality Handbook, November 1993;
- EPA Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition;
- US EPA Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, 1992;
- California Air Resources Board EMFAC7G on-road motor vehicle emission factor model;
- California Air Resources Board Emission Inventory Methodology 7.9, Entrained Paved Road Dust, 1997; and
- "Open Fugitive Dust PM10 Control Strategies Study," Midwest Research Institute, October 12, 1990.

Details of the emission calculation methodologies are provided in Appendix B.

To estimate the peak daily emissions associated with the construction activities, the anticipated schedule, the types and numbers of construction equipment were estimated. Additionally, estimates were made of the number of daily worker commuting trips and material delivery and removal trips for each of the construction activities. Table 4.1-2 lists the anticipated schedule, peak daily construction equipment requirements, peak daily motor vehicle trips, and estimated daily miles traveled by each motor vehicle. The information in the table was derived from previous experience with refinery and terminal construction.

Table 4.1-2
Construction Schedule, Equipment Requirements and Motor Vehicle Trips

Equipment/Vehicle Type	Number	Hours per Day Operation/Miles per Day per Vehicle
Light Hydro Unit No. 1 Modification (2/22/01 - 10/24/01)		
Tractor	1	2
Crane	1	4
Cherry Picker	1	3
Welding Machine	3	7
Backhoe	1	8
Forklift	1	6
Air Compressor	2	6
Generator	2	4

Light Plant	2	10
Off-site construction commuter	35	50
On-site construction commuter	2	10
Off-site delivery vehicle	10	10
On-site delivery vehicle	5	20
Off-site bus, worker transportation	1	60
On-site bus, worker transportation	1	15
Off-site pickup truck	2	40
On-site pickup truck	2	40
On-site flat bed truck	1	15
ISO SIV Conversion to Light Hydro Unit No. 2 (7/2/01 - 4/29/02)		
Tractor	1	3
Crane	1	6
Cherry Picker	3	6
Welding Machine	10	7
Backhoe	1	8
Forklift	1	6
Air Compressor	4	6
Light Plant	3	10
Concrete Pump	1	4

Table 4.1-2 (Cont.)

Construction Schedule, Equipment Requirements and Motor Vehicle Trips

Equipment/Vehicle Type	Number	Hours per Day Operation/Miles per Day per Vehicle
ISO SIV Conversion to Light Hydro Unit No. 2 (7/2/01 - 4/29/02) - (Cont.)		
Off-site construction commuter	90	50
On-site construction commuter	4	10
Off-site delivery vehicle	20	10
On-site delivery vehicle	10	20
Off-site bus, worker transportation	2	60
On-site bus, worker transportation	2	15
Off-site pickup truck	3	40
On-site pickup truck	3	40
On-site flat bed truck	1	105
No. 3 Reformer Fractionator Modifications (4/9/01 - 10/5/01)		
Tractor	1	3
Crane	1	6
Cherry Picker	1	3
Welding Machine	5	7

Backhoe	1	4
Forklift	1	6
Air Compressor	3	6
Generator	2	4
Light Plant	2	10
Off-site construction commuter	10	50
On-site construction commuter	1	10
Off-site delivery vehicle	5	10
On-site delivery vehicle	3	20
On-site flat bed truck	1	30
SFIA Debutanizer Modifications (3/5/01 - 9/6/01)		
Crane	1	6
Cherry Picker	1	3
Welding Machine	2	7
Backhoe	1	4
Forklift	1	4
Air Compressor	1	6
Generator	1	4
Light Plant	2	10
Concrete Pump	1	1
Front End Loader	1	4

Table 4.1-2 (Cont.)

Construction Schedule, Equipment Requirements and Motor Vehicle Trips

Equipment/Vehicle Type	**Number**	**Hours per Day Operation/Miles per Day per Vehicle**
SFIA Debutanizer Modifications (3/5/01 - 9/6/01) - (Cont.)		
Off-site construction commuter	30	50
On-site construction commuter	1	10
Off-site delivery vehicle	5	10
On-site delivery vehicle	2	20
On-site bus, worker transportation	1	15
Off-site pickup truck	1	40
On-site pickup truck	1	40
On-site flat bed truck	1	45
New FCCU Rerun Bottoms Splitter Construction (8/8/01 - 6/17/02)		
Tractor	1	3
Crane	1	6
Cherry Picker	4	5
Welding Machine	8	7
Backhoe	2	8

Forklift	1	6
Air Compressor	4	6
Generator	2	4
Light Plant	5	10
Concrete Pump	1	6
Front End Loader	1	8
Vibratory Roller	1	8
Off-site construction commuter	60	50
On-site construction commuter	3	10
Off-site delivery vehicle	15	10
On-site delivery vehicle	8	20
Off-site bus, worker transportation	2	60
On-site bus, worker transportation	2	15
Off-site pickup truck	3	40
On-site pickup truck	3	40
On-site flat bed truck	2	105

Table 4.1-2 (Cont.)
Construction Schedule, Equipment Requirements and Motor Vehicle Trips

Equipment/Vehicle Type	Number	Hours per Day Operation/Miles per Day per Vehicle
North Hydrogen Plant Modifications (1/2/02 - 5/6/02)		

Tractor	1	1
Crane	1	2
Cherry Picker	1	4
Welding Machine	4	7
Backhoe	1	8
Forklift	1	4
Air Compressor	3	6
Generator	2	6
Light Plant	2	10
Concrete Pump	1	4
Off-site construction commuter	20	50
On-site construction commuter	1	10
Off-site delivery vehicle	4	10
On-site delivery vehicle	2	20
Off-site bus, worker transportation	1	50
On-site bus, worker transportation	1	15
Off-site pickup truck	1	50
On-site pickup truck	1	40
On-site flat bed truck	1	15
MTBE Unit Conversion to Iso Octene Unit (1/1/02 - 9/2/02)		
Tractor	1	2
Crane	1	8
Cherry Picker	1	8
Welding Machine	3	7
Backhoe	1	8
Forklift	1	4
Air Compressor	2	6
Generator	2	6
Light Plant	2	10
Concrete Pump	1	4
Front End Loader	1	4
Vibratory Roller	1	4

Table 4.1-2 (Cont.)
Construction Schedule, Equipment Requirements and Motor Vehicle Trips

Equipment/Vehicle Type	Number	Hours per Day Operation/Miles per Day per Vehicle
MTBE Unit Conversion to Iso Octene Unit (1/1/02 - 9/2/02) - (Cont.)		

Off-site construction commuter	30	50
On-site construction commuter	2	10
Off-site delivery vehicle	10	10
On-site delivery vehicle	5	20
Off-site bus, worker transportation	1	50
On-site bus, worker transportation	1	15
Off-site pickup truck	2	50
On-site pickup truck	2	40
On-site flat bed truck	1	60
Cat Poly Unit Modification to Dimerization Unit (2/25/02 - 10/28/02)		
Tractor	1	3
Crane	2	8
Cherry Picker	2	8
Welding Machine	6	7
Backhoe	2	8
Forklift	1	4
Air Compressor	3	6
Generator	1	6
Light Plant	2	10
Concrete Pump	1	4
Front End Loader	2	4
Vibratory Roller	2	4
Off-site construction commuter	40	50
On-site construction commuter	3	10
Off-site delivery vehicle	12	10
On-site delivery vehicle	6	20
Off-site bus, worker transportation	2	50
On-site bus, worker transportation	2	15
Off-site pickup truck	3	50
On-site pickup truck	3	40
On-site flat bed truck	3	90

Table 4.1-2 (Cont.)
Construction Schedule, Equipment Requirements and Motor Vehicle Trips

Equipment/Vehicle Type	Number	Hours per Day Operation/Miles per Day per Vehicle

Mid-Barrel Unit Modification to Gasoline Hydrotreator (1/1/02 - 8/2/02)		
Tractor	1	2
Crane	1	5
Cherry Picker	1	8
Welding Machine	3	7
Backhoe	1	8
Forklift	1	4
Air Compressor	2	6
Generator	2	6
Light Plant	2	10
Concrete Pump	1	4
Front End Loader	1	4
Vibratory Roller	1	4
Off-site construction commuter	30	50
On-site construction commuter	2	10
Off-site delivery vehicle	10	10
On-site delivery vehicle	5	20
Off-site bus, worker transportation	1	50
On-site bus, worker transportation	1	15
Off-site pickup truck	2	50
On-site pickup truck	2	40
On-site flat bed truck	1	60
Tank Farm Piping Modifications (3/5/01 - 8/3/01)		
Tractor	1	1
Crane	1	2
Cherry Picker	1	3
Welding Machine	3	7
Backhoe	1	2
Forklift	1	2
Air Compressor	2	6
Off-site construction commuter	15	50
On-site construction commuter	1	10

Table 4.1-2 (Cont.)

Construction Schedule, Equipment Requirements and Motor Vehicle Trips

Equipment/Vehicle Type	Number	Hours per Day Operation/Miles per Day per Vehicle
Tank Farm Piping Modifications (3/5/01 - 8/3/01) - (Cont.)		
Off-site delivery vehicle	6	10

On-site delivery vehicle	2	20
Off-site bus, worker transportation	1	60
On-site bus, worker transportation	1	15
Off-site pickup truck	1	40
On-site pickup truck	1	40
On-site flat bed truck	1	15
Pentane Railcar Loading Facility Modifications for Off-Loading (7/2/01 - 1/31/02)		
Tractor	1	1
Crane	1	2
Cherry Picker	1	4
Welding Machine	4	7
Backhoe	1	2
Forklift	1	2
Air Compressor	3	6
Generator	2	6
Light Plant	2	10
Concrete Pump	1	2
Off-site construction commuter	50	50
On-site construction commuter	3	10
Off-site delivery vehicle	15	10
On-site delivery vehicle	8	20
Off-site bus, worker transportation	2	50
On-site bus, worker transportation	2	15
Off-site pickup truck	3	50
On-site pickup truck	3	40
On-site flat bed truck	1	15
Modifications for Pentane Transfer by Pipeline (8/6/01 - 1/3/02)		
Tractor	1	1
Crane	1	2
Cherry Picker	1	3
Welding Machine	5	7
Backhoe	1	6
Forklift	1	2
Air Compressor	2	6

Table 4.1-2 (Cont.)

Construction Schedule, Equipment Requirements and Motor Vehicle Trips

Equipment/Vehicle Type	Number	Hours per Day Operation/Miles per Day per Vehicle
Modifications for Pentane Transfer by Pipeline (8/6/01 - 1/3/02) - (Cont.)		
Off-site construction commuter	20	50

On-site construction commuter	2	10
Off-site delivery vehicle	8	10
On-site delivery vehicle	4	20
Off-site bus, worker transportation	1	60
On-site bus, worker transportation	1	15
Off-site pickup truck	1	50
On-site pickup truck	1	40
On-site flat bed truck	1	45
Polypropylene Loading Facility Modifications for Butane Loading and Off-Loading (8/6/01 - 2/6/02)		
Tractor	1	8
Crane	1	2
Cherry Picker	1	3
Welding Machine	2	7
Backhoe	3	8
Forklift	1	2
Air Compressor	2	6
Concrete Pump	1	6
Front End Loader	1	8
Vibratory Roller	3	8
Off-site construction commuter	50	50
On-site construction commuter	2	10
Off-site delivery vehicle	12	10
On-site delivery vehicle	6	20
Off-site bus, worker transportation	2	60
On-site bus, worker transportation	2	15
Off-site pickup truck	2	40
On-site pickup truck	2	40
On-site flat bed truck	3	90
Marine Terminal 2 Modifications for Ethanol Off-Loading (9/3/01 - 11/5/01)		
Tractor	1	1
Crane	1	2
Cherry Picker	1	4
Welding Machine	2	7
Backhoe	1	4

Table 4.1-2 (Cont.)

Construction Schedule, Equipment Requirements and Motor Vehicle Trips

Equipment/Vehicle Type	Number	Hours per Day Operation/Miles per Day per Vehicle
Marine Terminal 2 Modifications for Ethanol Off-Loading (9/3/01 - 11/5/01) - (Cont.)		
Forklift	1	2

Air Compressor	1	6
Generator	1	8
Concrete Pump	1	2
Off-site construction commuter	5	50
On-site construction commuter	1	10
Off-site delivery vehicle	2	10
On-site delivery vehicle	1	20
Off-site pickup truck	1	50
On-site pickup truck	1	10
On-site flat bed truck	1	15
Refrigerated Pentane Storage Tank Construction at Marine Terminal 2 (8/6/01 - 8/6/02)		
Tractor	1	2
Crane	1	8
Cherry Picker	1	4
Welding Machine	3	7
Backhoe	1	8
Forklift	1	4
Air Compressor	2	6
Generator	2	8
Light Plant	1	8
Concrete Pump	1	4
Front End Loader	1	4
Vibratory Roller	1	4
Off-site construction commuter	40	50
On-site construction commuter	2	10
Off-site delivery vehicle	8	10
On-site delivery vehicle	6	20
Off-site bus, worker transportation	1	50
Off-site pickup truck	2	50
On-site pickup truck	2	10
On-site flat bed truck	1	60

Table 4.1-2 (Cont.)

Construction Schedule, Equipment Requirements and Motor Vehicle Trips

Equipment/Vehicle Type	Number	Hours per Day Operation/Miles per Day per Vehicle
East Hynes Terminal Modifications for Ethanol Storage, Loading and Blending (8/1/01 - 12/31/01)		
Tractor	1	1
Crane	1	2
Cherry Picker	1	4

Welding Machine	2	7
Backhoe	1	4
Forklift	1	2
Air Compressor	1	6
Generator	1	8
Concrete Pump	1	2
Off-site construction commuter	5	50
On-site construction commuter	1	10
Off-site delivery vehicle	2	10
On-site delivery vehicle	1	20
Off-site pickup truck	1	50
On-site pickup truck	1	10
On-site flat bed truck	1	15
Vinvale Terminal Modifications for Ethanol Storage, Off-Loading and Blending (8/1/01 - 9/28/01)		
Tractor	1	1
Crane	1	2
Cherry Picker	1	4
Welding Machine	3	7
Backhoe	1	4
Forklift	1	2
Air Compressor	2	6
Generator	1	8
Light Plant	1	8
Concrete Pump	1	2
Off-site construction commuter	10	50
On-site construction commuter	1	10
Off-site delivery vehicle	2	10
On-site delivery vehicle	1	20
Off-site pickup truck	1	50
On-site pickup truck	1	10
On-site flat bed truck	1	15

Table 4.1-2 (Cont.)

Construction Schedule, Equipment Requirements and Motor Vehicle Trips

Equipment/Vehicle Type	Number	Hours per Day Operation/Miles per Day per Vehicle
Hathaway Terminal Modifications for Ethanol Storage, Loading and Blending (11/1/01 - 1/1/02)		
Tractor	1	1
Crane	1	2
Cherry Picker	1	4
Welding Machine	3	7

Backhoe	1	4
Forklift	1	2
Air Compressor	2	6
Generator	1	8
Light Plant	1	8
Concrete Pump	1	2
Off-site construction commuter	10	50
On-site construction commuter	1	10
Off-site delivery vehicle	2	10
On-site delivery vehicle	1	20
Off-site pickup truck	1	50
On-site pickup truck	1	10
On-site flat bed truck	1	15
Carson Terminal Modifications for Ethanol Storage, Off-Loading and Blending (6/12/01 - 8/8/01)		
Tractor	1	1
Crane	1	2
Cherry Picker	1	4
Welding Machine	2	7
Backhoe	1	4
Forklift	1	2
Air Compressor	1	6
Light Plant	1	8
Concrete Pump	1	2
Off-site construction commuter	5	50
On-site construction commuter	1	10
Off-site delivery vehicle	2	10
On-site delivery vehicle	1	20
Off-site pickup truck	1	50
On-site pickup truck	1	10
On-site flat bed truck	1	15

Table 4.1-2 (Cont.)
Construction Schedule, Equipment Requirements and Motor Vehicle Trips

Equipment/Vehicle Type	Number	Hours per Day Operation/Miles per Day per Vehicle
Colton Terminal Modifications for Ethanol Storage, Off-Loading and Blending (11/1/01 - 12/31/01)		
Tractor	1	1
Crane	1	2
Cherry Picker	1	4
Welding Machine	2	7

Backhoe	1	4
Forklift	1	2
Air Compressor	1	6
Generator	1	8
Concrete Pump	1	2
Off-site construction commuter	5	50
On-site construction commuter	1	10
Off-site delivery vehicle	2	10
On-site delivery vehicle	1	20
Off-site pickup truck	1	50
On-site pickup truck	1	10
On-site flat bed truck	1	15

The information in Table 4.1-2 was used to calculate on-site emissions from construction equipment exhaust and from fugitive dust PM_{10} emissions from grading.

The construction of a retention pond for butane and pentane at the polypropylene rail car loading racks is the only location where major excavation will take place. Minor excavation will occur during construction at other process units to install new foundations.

On-site fugitive dust PM_{10} emission estimates were based on the following estimates of peak daily dust-generating operations:

- Maximum of 1,000 cubic yards of soil excavated per day for the polypropylene railcar facility modifications, based on the total volume to be excavated, a typical excavation rate of 125 cubic yards per hour, and an anticipated eight hour per day excavation duration
- Maximum of 250 cubic yards of soil excavated per day for the remainder of construction, based on a typical excavation rate of 125 cubic yards per hour and an anticipated two hour per day excavation duration
- Maximum storage pile surface area of 0.07 acres for the polypropylene railcar facility modifications, conservatively set equal to the retention pond surface area
- Maximum storage pile surface area of 0.03 acres, conservatively set equal to anticipated area to be excavated at any one time (one-seventh of total of 9,000 square feet)
- Maximum daily on-site vehicle travel as listed in Table 4.1-2.

All estimates of fugitive dust emissions assume that construction activities will comply with SCAQMD Rule 403 - Fugitive Dust, by watering active sites two times per day, which reduces fugitive dust emissions approximately 50 percent.

In addition to the combustion emissions associated with the operation of paving equipment used to apply asphalt materials, VOC emissions are generated from the evaporation of hydrocarbons contained in the asphalt materials. The total area anticipated to be paved during construction at LAR is 0.172 acres (7,500 ft^2). About 0.069 acres (3,000 ft^2) will be paved during construction of the retention pond at the butane/pentanes loading/unloading area, and 0.062 acres (2,700 ft^2) will be paved during construction of the new FCCU Rerun Bottom Splitter. The remaining area to be paved (0.041 acres, 1,800 ft^2) will be located at various process units. It was conservatively assumed that all of the paving would occur during one day.

Architectural coating generates VOC emissions from the evaporation of solvents contained in the surface coatings applied to buildings. A VOC content of 2.40 pounds per gallon was used, based on specifications for Sherwin-Williams Hi-Solids Polyurethane (http://www.sherwinwilliams.com/ Builders/industrial/sysguide/), which is the coating that is anticipated to be used during construction. Only touch-up painting will be done on-site, because equipment will be factory-painted. The maximum daily use is anticipated to be 10 gallons.

Panels for the new pentane storage tank at Marine Terminal 2 will also be painted off-site. The seams will be painted on-site, and some touch-up painting will also take place. Since the tank will be insulated, it will be coated with primer only. The primer that will be used will be Carboline Carbozinc 7 WB or equivalent, which is a waterborne potassium silicate inorganic zinc primer, which contains no organic solvents. Therefore, no VOC emissions will be generated by the surface coating at Marine Terminal 2.

The maximum number and length of daily motor vehicle trips anticipated during each construction activity that is listed in Table 4.1-2 were used with the information about those trips in Table 4.1-3 to calculate peak daily emissions from both on- and off-site motor vehicles.

Table 4.1-3
Motor Vehicle Classes and Speeds During Construction

Vehicle Type	Vehicle Class	Speed (mph)
Off-site construction commuter	Light duty truck, cat	35
On-site construction commuter	Light duty truck, cat	15
Off-site delivery vehicle	Heavy heavy-duty truck, diesel	25
On-site delivery vehicle	Heavy heavy-duty truck, diesel	15
Off-site bus, worker transportation	Urban bus	15
On-site bus, worker transportation	Medium heavy-duty truck, diesel	15
Off-site pickup truck	Medium duty truck, cat	35
On-site pickup truck	Medium duty truck, cat	15
On-site flat bed truck	Medium heavy-duty truck, diesel	15

Table 4.1-4 lists the estimated peak daily criteria pollutant emissions during construction for each process unit at LAR and for the construction at each terminal.

Table 4.1-4
Peak Daily Construction Emissions by Process Unit/Activity/Terminal

Process/Activity/Terminal	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	Exhaust PM_{10} (lb/day)	Fugitive PM_{10} (lb/day)	Total PM_{10} (lb/day)
Light Hydro Unit #1 Modifications	58.0	9.5	54.1	3.7	2.7	14.5	17.3
ISO-SIV Conversion to Light Hydro Unit #2	132.4	20.7	107.4	7.2	5.2	32.9	38.1
#3 Reformer Fractionator Modifications	37.3	7.0	53.8	4.6	3.0	7.0	10.1
Debutanizer Modifications in Gasoline Fractionation Area	46.1	7.6	40.4	3.0	2.3	8.7	11.0
New FCCU Rerun Bottoms Splitter	123.7	20.8	127.7	9.1	6.6	32.4	39.0
North Hydrogen Plant Modifications	46.8	7.9	53.5	4.2	2.9	7.8	10.6
MTBE Unit Conversion to Iso-Octene	67.7	11.9	75.0	5.5	4.1	16.2	20.3
Cat-Poly Unit Conversion to Dimerization Unit	105.4	19.3	125.8	9.1	6.7	30.5	37.2
Mid-Barrel Unit Conversion to Gasoline Hydrotreater	65.5	11.1	69.2	5.0	3.7	16.2	19.9
Tank Farm Piping Modifications	28.1	4.9	28.6	2.0	1.4	8.1	9.5
New Pentane Off-Loading Racks at Pentane Rail Car Loading Facility	73.8	11.3	53.2	3.4	2.6	22.8	25.5
New Pentane Transfer Pumps at Pentane Spheres	39.8	6.6	39.6	2.7	1.9	12.9	14.8
Butane Loading Facilities at Polypropylene Loading Facility	102.9	17.3	108.8	7.3	5.1	48.7	53.8

Table 4.1-4 (Cont.)
Peak Daily Construction Emissions by Process Unit/Activity/Terminal

Process/Activity/Terminal	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	Exhaust PM_{10} (lb/day)	Fugitive PM_{10} (lb/day)	Total PM_{10} (lb/day)
Marine Terminal 2 Modifications for Ethanol Off-Loading	20.8	3.7	27.8	2.2	1.5	3.0	4.5
Marine Terminal 2 Modifications for Pentanes Shipping	72.8	12.3	72.4	5.3	3.9	16.0	19.9
East Hynes Terminal Modifications	20.8	3.7	27.8	2.2	1.5	3.0	4.5
Vinvale Terminal Modifications	27.6	4.7	33.3	2.8	1.9	3.2	5.0
Hathaway Terminal Modifications	27.6	4.7	33.3	2.8	1.9	3.2	5.0
Carson Terminal Modifications	20.8	3.7	27.8	2.2	1.5	3.0	4.5
Colton Terminal Modifications	20.8	3.7	27.8	2.2	1.5	3.0	4.5
General Grading	0.0	0.0	0.0	0.0	0.0	2.2	2.2
General Surface Coating	0.0	24.0	0.0	0.0	0.0	0.0	0.0
General Asphaltic Paving	0.0	0.1	0.0	0.0	0.0	0.0	0.0

Because the emission generating activities listed in Table 4.1-4 are not anticipated to all take place at the same time, the overall peak daily construction emissions will not be equal to the sum of the peak daily emissions from all of the construction activities. Therefore, the anticipated overlap of activities was evaluated to determine overall peak daily emissions. First, it was conservatively assumed that the peak daily emissions from each overlapping activity would occur at the same time. Next, the activities that are anticipated to occur simultaneously were identified for each week of the entire construction period (refer to Tables 8-A through 8-G in Appendix B). The peak daily emissions from the construction activities taking place each week were then added together to estimate the total peak daily emissions during each week. Finally, the week with the highest peak daily emissions was identified.

The resulting peak daily emissions are anticipated to occur during a period that includes:

- Modifications to Light Hydro Unit No. 1
- Conversion of the ISO SIV unit to Light Hydro Unit #2
- Modifications to the No. 3 Reformer Fractionator
- Conversion of the No. 1 Naphtha Splitter to a new debutanizer and conversion of the Super Fractionation Integrated Area (SFIA) Depentanizer to a naptha splitter
- Construction of a new FCCU Rerun Bottoms Splitter
- Construction of facilities and equipment for pentane off-loading at the Railcar Pentane Loading facility
- Modifications to transport pentanes by pipeline
- Construction of facilities for butane loading and off-loading at the railcar polypropylene loading facility
- Modifications at Marine Terminal 2 for marine tanker ethanol offloading and storage
- Modifications at Marine Terminal 2 for pentanes storage and marine tanker loading
- General grading
- General surface coating
- General asphaltic paving

The estimated emissions during this period are summarized in Table 4.1-5 along with the CEQA significance level for each pollutant. As shown in the table, significance thresholds are exceeded for all pollutants except SO_X during construction. However, these emissions represent a “worst-case,” because they incorporate the assumption that construction activities at each location occur at the peak daily levels throughout the construction period. It is unlikely that the peak daily levels would actually occur at all locations where construction is taking place at the same time.

Table 4.1-5
Overall Peak Daily Construction Emissions Summary (Pre-mitigation)

Source	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	Exhaust PM_{10} (lb/day)	Fugitive PM_{10} (lb/day)	Total PM_{10} (lb/day)
Construction Equipment Exhaust	321.9	66.5	608.4	53.7	34.4	0.0	34.4
On-Site Motor Vehicles	98.2	13.3	48.8	0.0	2.3	132.2	134.5
On-Site Fugitive PM10	N/A	N/A	N/A	N/A	N/A	20.0	20.0
Asphaltic Paving	N/A	0.5	N/A	N/A	N/A		
Architectural Coating	N/A	24.0	N/A	N/A	N/A		
Total On-Site	**420.1**	**104.2**	**657.2**	**53.7**	**36.7**	**152.2**	**188.9**
Off-Site Motor Vehicles	**335.8**	**45.2**	**89.0**	**0.0**	**1.6**	**55.1**	**56.7**
TOTAL	**755.9**	**149.4**	**746.2**	**53.7**	**38.3**	**207.3**	**245.6**

Table 4.1-5 (Cont.)
Overall Peak Daily Construction Emissions Summary (Pre-mitigation)

Source	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	Exhaust PM_{10} (lb/day)	Fugitive PM_{10} (lb/day)	Total PM_{10} (lb/day)
CEQA Significance Level	*550*	*75*	*100*	*150*			*150*
Significant? (Yes/No)	**Yes**	**Yes**	**Yes**	No			**Yes**

N/A = pollutant not emitted by this source
Note: Sums of individual values may not equal totals because of rounding

4.1.2 Operational Emissions

This section addresses the air quality impacts due to operation of the new and modified equipment associated with the proposed project. Impacts from indirect sources during operation, such as employee traffic, are discussed in Section 4.1.3.

4.1.2.1 Project Emission Sources

The sources of potential emissions resulting from new equipment and modifications to existing units proposed for the project are discussed below.

Los Angeles Refinery

At the LAR, the following equipment changes result in sources of emissions from fugitive components:

- Modifications to the LHU that include new heat exchangers, piping, pumps, and control systems.
- Conversion of ISO-SIV unit to a hydrotreater that includes new reactors, exchangers, pumps, and control systems.
- Modification of No. 3 Reformer Fractionator and overhead condenser, piping, and control systems including new pumps.
- Conversion of the No. 1 Naphtha Splitter to a new debutanizer and conversion of the Super Fractionation Integrated Area (SFIA) Depentanizer to a naptha splitter including changes to heat exchangers, pumps, and control systems
- New FCCU rerun bottoms splitter including a tower and heat exchanger.
- Alternate feedstock to north hydrogen plant including a new feed drum, pump, and vaporizer.
- Conversion of existing MTBE unit to iso-octene unit including new heat exchangers.
- Modification of existing catpoly unit to a dimerization unit hydrotreater reactor system including new pumps, heat exchangers, vessels, piping, and control systems.
- Modification of mid-barrel unit to gasoline hydrotreater including changes to the feed and product piping, hydrogen supply system, heat exchanger, and control systems.
- Piping modification and substation upgrades to ship pentane to Marine Terminal 2 by pipeline including a new pentane pump.
- New equipment for pentane and butane off-loading at the existing propylene railcar loading facility at Northeast Property.

In addition to these new and modified units, existing tanks at LAR will be converted to a revised service. For purposes of estimating emissions, it was assumed that service would change for tanks 14, 31, 32, 36, 37, 41, 42, 45, 50, 51, 52, 53, 54, 55, 64, 65, 69, and 71, and that ten of these tanks will primarily be converted from MTBE and additive service to other additives. The other eight of the tanks are assumed to change from the current finished product to the proposed product to be shipped to the terminals for final blending with ethanol. This change in service is anticipated to reduce actual VOC emissions from most of the tanks, because most of the new materials that will be stored in the tanks have a lower vapor pressure than the materials that are currently in the tanks. The change in emissions from the storage tanks has been estimated in order to evaluate potential impacts on the physical environment. However, the storage tanks are permitted for materials with higher vapor pressures. Therefore, since the reductions resulting from changes in service do not also include permit modifications limiting emissions to the lower levels, they will not be included in the evaluation of the significance of the project emissions.

The sulfur content of the finished product will also be reduced from its current level. The removal of additional sulfur from gasoline will increase the sulfur recovered by the sulfur plant, which will lead to an increase in SO_X emissions.

The new hydrotreating unit will require additional hydrogen consumption. However, this hydrogen will be imported instead of being produced at LAR. Therefore, fuel use at LAR for hydrogen production will not increase, so the project will not generate additional NO_X emissions.

Marine Terminal 2

At Marine Terminal 2, tanks 233 and 225 will be removed, and a new refrigerated tank of 100,000 barrel (bbl, 42 gallons each) capacity will be installed to store pentane, which will subsequently be loaded into marine tankers for shipment. In addition, two existing tanks will be converted to ethanol service. For purposes of estimating emissions, it was assumed that tanks 220 and 223 will be converted.

The new pentane storage tank, as well as tank and piping modifications to the converted ethanol tanks will result in fugitive emissions from various components. Additionally, emissions will occur during marine tanker pentane loading. The emissions from the demolished tanks will be eliminated when they are removed.

The change in service of the converted ethanol tanks is also anticipated to lead to a reduction in emissions because of differences in the vapor pressures between ethanol and the materials currently stored. This potential reduction has been estimated, but, as in the case of LAR, is not included in the evaluation of the project's significance.

Hathaway Terminal

Ethanol will be brought to the Hathaway Terminal by tanker trucks or pipelines as feasible.

At the Hathaway Terminal, existing storage tanks will be converted to ethanol service, and existing blending skids will be modified to load ethanol into tanker trucks for shipment to other terminals. For purposes of estimating emissions, it was assumed that tanks 103, 106, 109, 30021, 30022, 30023, 30029 will be converted. The equipment modifications will add valves and flanges, which are sources of fugitive emissions. Additionally, emissions will occur during tanker truck ethanol loading.

The change in service of tanks to ethanol is also anticipated to lead to a reduction in emissions because of differences in the vapor pressures between ethanol and the materials currently stored. This potential reduction has been estimated, but as in the case of LAR, is not included in the evaluation of the project's significance.

East Hynes Terminal

At the East Hynes Terminal, one tank will be converted to ethanol service. For purposes of estimating emissions, it was assumed that tank 798 will be converted. The associated tank and piping modifications are sources of fugitive emissions from these components.

Ethanol will be brought to the East Hynes Terminal by pipelines or by tanker trucks from the Hathaway Terminal, as feasible. Two new blending skids with motor operated valves will be installed for ethanol service. These new blending skids would be expected to generate fugitive emissions.

The change in service of a tank to ethanol is also anticipated to lead to a reduction in emissions because of differences in the vapor pressures between ethanol and the materials currently stored. This potential reduction has been estimated, but as in the case of LAR, is not included in the evaluation of the project's significance.

Vinvale Terminal

At the Vinvale Terminal, two tanks will be converted to ethanol service. For purposes of estimating emissions, it was assumed that tanks 940 and 941 will be converted. The associated tank and piping modifications are sources of fugitive emissions.

Ethanol will be brought to the Vinvale Terminal by tanker trucks from the Hathaway or East Hynes Terminals, or via pipelines, as feasible. Two currently permitted offloading pumps will be used for ethanol, and existing blending skids will be modified to handle ethanol. The new pumps and other components added to the blending skids for ethanol service are sources of project emissions.

The change in service of a tank to ethanol is also anticipated to lead to a reduction in emissions because of differences in the vapor pressures between ethanol and the materials currently stored. This potential reduction has been estimated, but as in the case of LAR, is not included in the evaluation of the project's significance.

Carson Terminal

At the Carson Terminal, one tank will be converted to ethanol service. For purposes of estimating emissions, it was assumed that tank 101 will be converted. The associated tank and piping modifications are sources of fugitive emissions.

Ethanol will be brought to the to the Carson Terminal from the Hathaway or East Hynes Terminals by tanker trucks or pipeline as feasible. Existing blending skids will be modified to handle ethanol. Components added to the blending skids for ethanol service are sources of project emissions.

The change in service of a tank to ethanol is also anticipated to lead to a reduction in emissions because of differences in the vapor pressures between ethanol and the materials currently stored. This potential reduction has been estimated, but as in the case of LAR, is not included in the evaluation of the project's significance.

Colton Terminal

At the Colton Terminal, an existing tank will be converted to ethanol service. For purposes of estimating emissions, it was assumed that tank 15 will be converted. The associated tank and piping modifications are sources of fugitive emissions.

Ethanol will be brought to the Colton Terminal from the Hathaway or East Hynes Terminals by tanker trucks. Existing blending skids will be modified to handle ethanol. Components added to the blending skids for ethanol service are sources of project emissions.

The change in service of tanks to ethanol is also anticipated to lead to a reduction in emissions because of differences in the vapor pressures between ethanol and the materials currently stored in them. This potential reduction has been estimated, but as in the case of LAR, is not included in the evaluation of the project's significance.

4.1.2.2 Direct Operational Emission Calculation

Direct operational criteria and toxic air pollutant emission rates were calculated for all new and modified emission sources associated with the project at LAR and at the terminals. A further description of emissions estimates is provided in Appendix B.

ARCO provided expected fugitive component counts, stream types, and composition of process fluids to be utilized or produced as intermediates or end products as a result of the project. These composition data, as well as SCAQMD fugitive emission factors were used to calculate fugitive VOC and air toxic emissions associated with each of the new and modified units and tanks at LAR and the six terminals. The change in emissions was determined by ~~comparing~~ adding the emissions associated with new components to the existing level of emissions and subtracting out the emissions associated with the components to be removed. ARCO estimated the numbers and types of service for components to be added and removed for each LAR process unit and at the terminals. These estimates included a 40 percent contingency factor for new valves and flanges to account for potential increases during detailed design. Additionally, it was assumed for all but four of the units that 75 percent of the new valves would be bellows valves and that none of the removed vales are bellows valves. The exceptions were modifications to the LHU, at the ISP-SIV unit, the No. 3 Reformer Fractionator and the units in the SFIA, for which more detailed design has been completed.

ARCO has in place a SCAQMD-approved inspection and maintenance program to detect and remedy leaks from process components. This program has reduced overall emissions to levels below those that would be calculated using the SCAQMD fugitive VOC emission factors. Therefore, the use of those emission factors to calculate reductions in fugitive VOC emissions from components removed during equipment modifications likely overestimated the extent of the reductions. However, the inspection and maintenance program is also anticipated to reduce emissions from the components that are added during equipment modifications to levels below those that were calculated using the emission factors. Therefore, any estimated net increase or decrease in fugitive VOC emissions from process components is overestimated.

Emissions from the new pentane tank and the tanks that are anticipated to be demolished at Marine Terminal 2, as well as emission changes resulting from changes in service for the existing tanks were calculated using the EPA program TANKS, version 3.1. The existing emissions were calculated using the physical tank data, meteorological data, existing services and throughput quantities for 1998-1999 provided by ARCO. The projected new emissions were calculated using the same physical tank data and meteorological data, as well as revised services and proposed throughput quantities as provided by ARCO. The change in emissions was calculated by comparing the existing and proposed emissions for each tank. The decrease in emissions for the tanks to be removed are based on the actual values reported in the 1998-1999 report to the SCAQMD.

Emissions from the increased pentane loading of rail cars at LAR and marine tanker pentane loading at Marine Terminal 2 were calculated using emission factors from AP-42 and an estimated 99.5% control efficiency for the thermal oxidizer vapor recovery units (VRUs) at the two locations. Emissions from tanker truck loading with ethanol at the Hathaway terminal were calculated using the SCAQMD Rule 462 emission limit of 0.08 lb/1,000 gallons loaded.

Normally, 50 percent of the pentane is anticipated to be shipped by marine tanker at Marine Terminal 2 and the other 50 percent is anticipated to be shipped by railcar from LAR. However, the capacity of a marine tanker, which would be expected to be loaded completely in a single day, is larger than the combined capacities of the railcars that would be loaded in a single day. Because rail cars could potentially be loaded with pentane the same day that a marine tanker is loaded, the estimated peak daily emissions included emissions from both loading operations.

The ethanol that will be loaded into tanker trucks at the Hathaway terminal contains five percent gasoline as a denaturant. Therefore, emissions of toxic air contaminants from the denaturant during this loading were estimated.

The removal of additional sulfur from gasoline will increase the sulfur recovered by the sulfur plant. ARCO estimated that the additional sulfur to be removed will be 1,000 lb/day, based on expected production rates and feed sulfur content. Based on the operational history of the sulfur plant, the recovery efficiency has consistently exceeded 99.5 percent. Therefore, a value of 99.5 percent was used to estimate increased SO_X emissions.

The direct operational criteria pollutant emissions are summarized in Table 4.1-6.

Anticipated changes in peak daily operational emissions of toxic air contaminants are listed in Table 4.1-7A for each new or modified process unit at LAR and in Table 4.1-7B for each of the terminals. Table 4.1-7A shows that both increases and decreases in toxic air contaminant emissions are anticipated at LAR, depending on the individual species and individual process unit. When components (valves, flanges, pumps, etc) are removed during modification of a process unit, emissions of TACs in the process streams associated with those components will no longer

Table 4.1-6
Peak Daily Project Direct Operational Emissions Summary

Source	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)
Los Angeles Refinery					
Fugitive VOC from process components	0.0	-34.1	0.0	0.0	0.0
Rail car pentane loading	0.0	7.1	0.0	0.0	0.0
Sulfur recovery plant	0.0	0.0	0.0	10.0	0.0
Subtotal	**0.0**	**-27.0**	**0.0**	**10.0**	**0.0**
Marine Terminal 2 pentane storage and shipping					
Fugitive VOC from components	0.0	3.1	0.0	0.0	0.0
Pentane storage tank	0.0	17.6	0.0	0.0	0.0
Demolished tanks	0.0	-0.2	0.0	0.0	0.0
Marine tanker loading	0.0	44.6	0.0	0.0	0.0
Subtotal	**0.0**	**65.1**	**0.0**	**0.0**	**0.0**
Marine Terminal 2 Ethanol Storage					
Fugitive VOC from components	**0.0**	**0.8**	**0.0**	**0.0**	**0.0**
Hathaway Terminal					
Fugitive VOC from components	0.0	0.8	0.0	0.0	0.0
Tanker truck loading	0.0	31.0	0.0	0.0	0.0
Subtotal	**0.0**	**31.8**	**0.0**	**0.0**	**0.0**
East Hynes Terminal					
Fugitive VOC from components	**0.0**	**5.0**	**0.0**	**0.0**	**0.0**
Vinvale Terminal					
Fugitive VOC from components	**0.0**	**2.2**	**0.0**	**0.0**	**0.0**
Carson Terminal					
Fugitive VOC from components	**0.0**	**0.9**	**0.0**	**0.0**	**0.0**
Colton Terminal					
Fugitive VOC from components	**0.0**	**0.9**	**0.0**	**0.0**	**0.0**
Total Direct Emissions	**0.0**	**79.6**	**0.0**	**10.0**	**0.0**
Note: Sums of individual values may not equal totals because of rounding.					

Table 4.1-7A
Peak Daily Project Direct Operational Toxic Air Pollutant Emissions Summary, LAR

Species	Emissions (lbs/year)												
	LHU #1	LHU #2	No. 3 Refor-mer Fract-ionator	SFIA De-butanizer	New FCCU Reruns Bottom Splitter	North Hydro-gen Plant	Conver-sion of MTBE Unit to ISO-Octene Unit	Modifi-cation of Cat Poly Unit to Dimeri-zation Unit	Modifi-cation of Mid-Barrel Unit to Gasoline Hydro-treater	Tank Farm Piping Modifi-cations	Pentane Tranfser to Marine Terminal 2	Butane Loading/ Unloading Facilities	LAR Total
Toxic Air Contaminants for Which Health risk Factors Exist													
Benzene[a]	17.8	-1,370.00	-184.8	158.9	70.6	0.0	0.0	-62.3	6.9	17.6	0.0	0.0	**-1,345.2**
1,3-Butadiene[a]	0.0	0.0	0.0	0.0	0.0	0.0	-5.6	0.0	0.0	0.0	0.0	0.0	**-5.6**
Cresol (Mixed)[a]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	**0.4**
Hydrogen Cyanide	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.6**
Hydrogen Sulfide[a]	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.6**
Methyl Alcohol[a]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Naphthalene	0.1	5.0	0.0	0.0	23.4	0.0	-18.4	265.4	0.0	0.0	0.0	0.0	**275.6**
Phenol[a]	0.0	-0.9	-0.1	0.1	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	**-0.6**
Propylene	1.7	-360.6	0.0	9.6	0.6	0.0	-494.4	-0.6	0.0	0.0	0.0	94.4	**-749.1**
Toluene[a]	19.0	186.5	-1.5	-14.2	296.5	0.0	0.0	-259.4	6.9	0.0	0.0	0.0	**233.7**
Xylenes (Mixed)[a]	63.9	536.8	0.0	-15.3	455.0	0.0	0.0	-361.0	25.9	0.0	0.0	0.0	**705.3**
Other Toxic Air Contaminants													
2,2,4-Trimethyl Pentane	0.0	0.9	0.0	0.0	3.0	0.0	0.0	-2.6	0.0	915.7	0.0	0.0	**917.0**
Cumene	0.0	1.0	0.0	0.0	3.4	0.0	0.0	-2.6	0.0	0.0	0.0	0.0	**1.9**
Ethyl Benzene	0.8	26.1	0.0	-61.2	85.5	0.0	0.0	-69.6	0.0	0.0	0.0	0.0	**-18.5**
Hexane	36.8	-4,234.3	-475.5	443.0	54.4	0.0	0.0	-48.0	13.8	0.0	0.0	0.0	**-4,209.7**

[a] SCAQMD Rule 1401 Carcinogenic Air contaminant

Table 4.1-7B
Peak Daily Project Direct Operational Toxic Air Pollutant Emissions Summary, Terminals

Species	Emissions (lbs/year)					
	Marine Terminal 2	**Hathaway Terminal**	**East Hynes Terminal**	**Vinvale Terminal**	**Carson Terminal**	**Colton Terminal**
Toxic Air Contaminants for Which Health Risk Factors Exist						
Benzene[a]	-3.4	-29.6	-20.7	-12.6	-3.8	-2.4
1,3-Butadiene[a]	0.0	0.0	0.0	0.0	0.0	0.0
Cresol (Mixed)[a]	0.0	0.0	0.0	0.0	0.0	0.0
Hydrogen Cyanide	0.0	0.0	0.0	0.0	0.0	0.0
Hydrogen Sulfide[a]	0.0	0.0	0.0	0.0	0.0	0.0
Methyl Alcohol[a]	0.0	0.0	0.0	0.0	0.0	0.0
Naphthalene	-25.4	-0.1	-5.4	-0.1	0.0	0.0
Phenol[a]	0.0	0.0	0.0	0.0	0.0	0.0
Propylene	0.0	0.0	0.0	0.0	0.0	0.0
Toluene[a]	-17.8	-80.5	-62.7	-44.1	-10.3	-6.3
Xylenes (Mixed)[a]	-30.1	-25.2	-20.5	-14.6	-3.4	-2.1
Other Toxic air Contaminants						
2,2,4-Trimethyl Pentane	-13.5	-313.4	-19.6	-76.7	-1.4	-0.4
Cumene	0.0	-0.1	-0.1	-0.1	0.0	0.0
Ethyl Benzene	-6.8	-5.8	-4.6	-3.2	-0.8	-0.5
Hexane	-5.8	-121.0	-63.0	-27.4	-13.5	-8.5
[a] SCAQMD Rule 1401 Carcinogenic Air contaminant						

occur. When components are added to a modified unit, emissions of TACs in the process streams associated with those new components will be introduced. These decreased and increased in TAC emissions caused by the removal and addition of components can result in either a net increase or a net decrease in emissions of individual TACs, depending on the number of components added and removed and the TACs in the streams associated with those components. Table 12 in Attachment B-2 to Appendix B lists the changes in TAC emissions associated with each refinery stream processed by each process unit. Overall, net decreases in emissions of benzene, 1,3-butadiene, phenol, propylene and ethyl benzene are anticipated. Emissions of cresols, hydrogen cyanide, hydrogen sulfide, toluene, xylenes, 2,2,4-trimethyl pentane and cumene are anticipated to increase. Potential effects on human health of these changes in emissions were estimated as described below in Section 4.1.4.2.

Note that, although the units that are being modified do not process propylene as a feed material, some of the streams that are processed by some of the units contain some propylene. In particular, the ISO-SIV unit currently processes a stream that contains about five percent propylene. This stream will no longer be processed when the ISO-SIV unit is converted to LHU #2, so the propylene emissions will from this stream will be eliminated. Similarly, the MTBE unit currently processes a stream that contains about 18 percent propylene. This stream will continue to be processed when the MTBE unit is converted to an iso-octene unit, but non-bellows seal valves, which generate fugitive emissions, will be replaced with leakless bellows seals valves that do not generate fugitive emissions, and four pumps, which also generate fugitive emissions, will be removed. These modifications will also lead to a decrease in propylene emissions.

Table 4.1-7B also shows that no increases in emissions of any toxic air contaminant are anticipated at any of the terminals.

Table 4.1-8 summarizes VOC emission changes that might occur from changes in storage tank service. The decreases shown are caused primarily by the lower vapor pressures of the new tank service. However, as mentioned previously, the storage tanks are permitted to store materials with higher vapor pressures, so the reductions in the table are not included in the project's anticipated operational emissions.

Table 4.1-8
Anticipated Changes in VOC Emissions from Changes in Storage Tank Service

Source	VOC Emissions Change (lbs/day)
Los Angeles Refinery	-174
Marine Terminal 2	-4
Hathaway Terminal	-73
East Hynes Terminal	-12
Vinvale Terminal	-8
Carson Terminal	-2
Colton Terminal	-1
Total	**-274**

4.1.3 Indirect/Mobile Source Operation Emissions

In addition to the process-related changes that will result from the modifications to LAR and the terminals, emissions from offsite indirect sources will increase. These offsite indirect sources include commuting trips by additional workers at LAR and tanker truck transport of ethanol to the terminals. Emission estimates were based on the following assumptions:

- Ten new employees would be required at LAR;
- A total of 44 daily round trips would be made from the Hathaway Terminal to other terminals by tanker trucks as follows:
  - 18 trips to the Vinvale Terminal
  - 6 trips to the Carson Terminal
  - 8 trips to the Colton Terminal
  - 5 trips to the East Hynes Terminal
  - 7 trips to destinations outside the South Coast Air Basin

Appendix B provides further description of the emission estimating methodologies.

Ethanol will be imported by marine tanker, and pentane will be exported by marine tanker or by rail. MTBE and methanol are currently imported by marine tanker, and these imports will cease when ethanol imports for the proposed project begin. Based on the volumes of ethanol and pentane to be transported, anticipated vessel capacities, and the current frequency of MTBE and methanol shipments, ARCO anticipates that the number of ship calls will decrease by at least 14 each year. Therefore, a net decrease in indirect emissions from marine tankers is anticipated.

Although pentane will be exported by rail car, it is anticipated that only four additional rail cars will leave the refinery each day. This minor increase in rail car movements will not require additional operating time for onsite ARCO locomotives or for offsite common carrier locomotives.

Table 4.1-9 summarizes the indirect source estimated travel resulting from the proposed project. Resulting emissions from these vehicle trips are estimated to be 42, 6, 49 and 57 lbs/day for CO, VOC, NO_X and PM_{10}, respectively.

Table 4.1-9
Offsite Operational Indirect Mobile Sources

Vehicle Type	Maximum Number of Vehicles	Miles/Day (each vehicle)
New employee commuter traffic	10	50
Ethanol tanker, Hathaway to Vinvale	18	28
Ethanol Tanker, Hathaway to Carson	6	20
Ethanol Tanker, Hathaway to Colton	8	120
Ethanol Tanker, Hathaway to East Hynes	5	12
Ethanol Tanker, Hathaway to Outside of South Coast Air Basin	7	100

4.1.4 Significance of Project Operational Emissions

To determine the air quality impacts from the emissions of criteria pollutants from operation of the project, there are two types of significance criteria to which the emissions are compared and analyzed. First, the project operational emissions are compared to specific significance thresholds established for project emissions; and second, the project operational emissions are analyzed through air dispersion modeling to determine if the project may create changes in localized concentrations of air pollutants above the identified human health risk significance criteria. The air dispersion modeling and health risk assessment were only conducted for LAR, because operational emissions of each individual toxic air contaminant are anticipated to decrease at each terminal, as shown in Table 4.1-7.

4.1.4.1 Operational Emissions Summary

A summary of the project's daily emissions from RECLAIM sources are shown in Table 4.1-10. Table 4.1-11 includes the daily totals for both direct project emissions and offsite indirect emissions from non-RECLAIM sources. The summarized project operational emissions are compared to the CEQA significance thresholds. The project operational emissions exceed the significance threshold for VOC.

Table 4.1-10
Project Operational Criteria Pollutant Emissions Summary for RECLAIM Sources

Pollutant	Project Emissions (lb/day)	RECLAIM Allocations[a] (lb/day)	Total (lb/day)	SCAQMD CEQA Threshold (lb/day)	Significant?
NO_X	0.0	7,810	7,810	10,210	No
SO_2	10.0	6,427	6,437	10,299	No

(a) The 1998 facility Allocation for NO_x and SO_x includes purchased RTCs and is converted to pounds per day by dividing 365 days per year.

Table 4.1-11
Project Operational Criteria Pollutant Emissions Summary for Non-RECLAIM Sources

Pollutant	Direct Emissions (lb/day)	Indirect Emissions (lb/day)	Total (lb/day)	SCAQMD CEQA Threshold (lb/day)	Significant?
CO	0.0	41.8	41.8	550	No
VOC[a]	79.6	6.3	85.9	55	**Yes**
NO_X	0.0	49.2	49.2	55	No
SO_X	0.0	0.0	0.0	150	No
PM_{10}	0.0	57.4	57.4	150	No

(a) Does not include emission changes from changes in tank service.

4.1.4.2 Health Risk Assessment

Atmospheric dispersion modeling was conducted to determine the localized ambient air quality impacts from the proposed project. A health risk assessment was prepared for LAR, but not for the six terminals because emissions for every toxic air contaminant are anticipated to decrease at each terminal as shown in Table 4.1-7. Therefore, health risks are not anticipated to increase at the terminals. The modeling follows protocols used in preparation of a prior analysis related to LAR, the 1995 ARCO LAR Health Risk Assessment (HRA).

The atmospheric dispersion modeling methodology used for the project follows generally accepted modeling practice and the modeling guidelines of both the EPA and the SCAQMD. All dispersion modeling was performed using the Industrial Source Complex Short-Term 3 (ISCST3) dispersion model (Version 00101) (EPA, 2000). The outputs of the dispersion model were used as input to a risk assessment using the ACE2588 (Assessment of Chemical Exposure for AB2588) risk assessment model (Version 93288) (CAPCOA, 1993).

This section provides details of the modeling performed and the results of the modeling. Model output listings of model runs are provided in the Air Quality Technical Attachment (Appendix B).

Model Selection

The dispersion modeling methodology used follows EPA and SCAQMD guidelines. The ISCST3 model (Version 00101) is an EPA model used for simulating the transport and dispersion of emission sources in areas of both simple, complex, and intermediate terrain. Simple terrain, for air quality modeling purposes, is defined as a region where the heights of release of all emission sources are above the elevation of surrounding terrain. Complex terrain is defined as those areas where nearby terrain elevations exceed the release height of emissions from one or more sources. Intermediate terrain is that which falls between simple and complex terrain. Terrain areas of all three types exist in the vicinity of the LAR.

Modeling Options

The options used in the ISCST3 dispersion modeling are summarized in Table 4.1-12. EPA regulatory default modeling options were selected except for the calm processing option. Since the meteorological data set developed by the SCAQMD is based on hourly average wind measurements, rather than airport observations that represent averages of just a few minutes, the SCAQMD's modeling guidance requires that this modeling option not be used.

Meteorological Data

The SCAQMD has established a standard set of meteorological data files for use in air quality modeling in the Basin. For the vicinity of the LAR, the SCAQMD requires the use of its Long Beach 1981 meteorological data file. This is the meteorological data file used for recent air quality and Health Risk Assessment (HRA) modeling studies at LAR. To maintain consistency with this prior modeling, and following SCAQMD modeling guidance, the 1981 Long Beach meteorological data set was used for this modeling study.

In the Long Beach data set, the surface wind speeds and directions were collected at the SCAQMD's Long Beach monitoring station, while the upper air sounding data used to estimate hourly mixing heights were gathered at Los Angeles International Airport. Temperatures and sky observation (used for stability classification) were taken from Long Beach Airport data.

Table 4.1-12
Dispersion Modeling Options for ISCST3

Feature	Option Selected
Terrain processing selected	Yes

Meteorological data input method	Card Image
Rural-urban option	Urban
Wind profile exponents values	Defaults
Vertical potential temperature gradient values	Defaults
Program calculates final plume rise only	Yes
Program adjusts all stack heights for downwash	Yes
Concentrations during calm period set = 0	No
Aboveground (flagpole) receptors used	No
Buoyancy-induced dispersion used	Yes
Surface station number	53101
Year of surface data	1981
Upper air station number	91919
Year of upper air data	1981

Receptors

Appropriate model receptors must be selected to determine the “worst-case” modeling impacts. For this modeling, receptors were located: a) along the perimeter of the facility with a spacing of approximately 100 meters; and b) extending from the property line to approximately 500 hundred meters with a spacing of approximately 100 meters. No receptors were placed within the LAR property line. Terrain heights for all receptors were assumed to be zero since the LAR is relatively close to sea level.

Source Parameters

Table 4.1-13 summarizes the source parameter inputs to the dispersion model. The source parameters presented in this table are based upon the parameters of the existing equipment at the facility. The facility has been divided into process areas based on facility operations and are identified by numbers ranging from 30 to 74. The fugitive components were modeled as emissions contributing to the area source in which they are located. Each of the area sources was modeled as a polygon with up to 16 vertices. The coordinate listed in Table 4.1-13 is the first vertex of the polygon. The emission rate used in the ISCST3 model run is in units of g/s-m^2. A unit emission rate of 1 g/s was used, so that the emission rate is the inverse of the area in units of g/s-m^2.

Table 4.1-13

Source Location and Parameters Used in Modeling the Proposed Project

Source ID/Project Units	Source Type	X [m]	Y [m]	Release Height [m]	Sigma z [m]	Area [m^2]	Q [$g/s-m^2$]
AREA_30/MTBE Unit converted to iso-octene	AREA	198	464	1.5	2.3	15,223	6.569E-05
AREA_44/Cat Poly Unit converted to pentene dimerization	AREA	-365	1341	1.5	2.3	19,321	5.176E-05
AREA_49/North Hydrogen Plant	AREA	-242	1691	1.5	2.3	33,806	2.958E-05
AREA_55/New pentane shipping pumps	AREA	389	700	1.5	6.8	48,102	2.079E-05
AREA_56/Butane railcar loading facility	AREA	393	1367	1.5	2.3	232,378	4.303E-06
AREA_57/LHU No. 1 and Mid-Barrel Unit converted to gasoline hydrotreater	AREA	-522	1312	1.5	2.3	21,486	4.654E-05
AREA_59/No. 3 Reformer Fractionator	AREA	-366	1546	1.5	2.3	18,341	5.452E-05
AREA_60/ISO-SIV Unit converted to LHU No. 2, SFIA Debutanizer, and new FCCU Reruns Bottom Splitter	AREA	20	752	1.5	2.3	31,110	3.214E-05
AREA_65/Tank Farm Piping	AREA	-2493	3126	1.5	6.3	581,646	1.719E-06

<u>Emissions</u>

The modeling was performed using only direct operational emissions associated with the proposed project. These emissions consisted of toxic emissions resulting from the removal and addition of fugitive components in various refinery streams at the LAR. Since the components are associated with a variety of streams, the emissions for some toxic pollutants increased at a specific location, whereas other toxics decreased. Thus, two model runs were created, one for the increase in toxic emissions and one for the decrease. The emission rate used in the ACE model run was in units of g/s which was derived from the annual emission rate in lb/yr assuming continuous operations at 8,760 hours per year.

Health Risks

The potential health risks impacts that are addressed are carcinogenic, chronic noncarcinogenic, and acute noncarcinogenic.

The ACE2588 Risk Assessment Model (Version 93288) was used to evaluate the potential health risks from TACs. The ACE2588 model, which is accepted by the California Air Pollution Control Officers Association (CAPCOA), has been widely used for required health risk assessments under the CARB AB2588 toxic hotspots reporting program. The model provides conservative algorithms to predict relative health risks from exposure to carcinogenic, chronic noncarcinogenic, and acute noncarcinogenic pollutants. This multipathway model was used to evaluate the following routes of exposure: inhalation, soil ingestion, dermal absorption, mother's milk ingestion, and plant product ingestion. Exposure routes from animal product ingestion and water ingestion were not assumed for this analysis.

The 93288 version of ACE2588 incorporates revised toxicity and pathway data recommended in the October 1993 CAPCOA HRA guidance. The pathway data in ACE2588 were modified to include site-specific fractions of homegrown root, leafy, and vine plants. These site-specific fractions were used to maintain consistency with assumptions previously accepted for this particular site location by SCAQMD.

The results obtained based on the CAPCOA HRA guidance are considered to be consistent with those which would be obtained following SCAQMD's Risk Assessment Procedures for Rules 1401 (SCAQMD, 2000) and 212 (SCAQMD, 1997).

Only TACs identified in the CAPCOA HRA guidance with potency values or reference exposure levels have been included in the HRA. The TACs emitted from the proposed project consist of benzene, 1,3-butadiene, cresols, hydrogen sulfide, methanol, naphthalene, phenol, propylene, toluene, and xylenes.

The dose-response data used in the HRA were extracted from the October 1993 CAPCOA HRA Guidelines. The pertinent data are located in Tables III-5 through III-10 of the CAPCOA guidance. For this analysis, naphthalene is considered toxic or carcinogenic for non-inhalation exposures.

Following CAPCOA guidance, the inhalation, dermal absorption, soil ingestion, and mother's milk pathways were included in a multipathway analysis. Pathways not included in the analysis are water ingestion, fish, crops, and animal and dairy products that were not identified as a potential concern for the project setting.

Inhalation pathway exposure conditions were characterized by the use of the ISCST3 dispersion model as previously discussed.

Significance criteria for this EIR is an increased cancer risk of 10 in one million or greater. The established SCAQMD Rule 1401 limits are 1.0 in one million cancer risk for sources without best available control technology for toxics (T-BACT) and ten in one million for those with T-BACT. The significance criteria for noncarcinogenic acute and chronic hazard are indices of 1.0 for any endpoint.

The predicted cancer risks at each of the modeled receptors was compared for the model run using the increased emissions and the run based on the decreased emissions to determine the net cancer risk at each modeled receptor. These net changes ranged from an increase of 0.21 per million to a decrease of 17.6 per million. The peak receptor is located 2 km west of the property boundary and is well below the significance levels of 1.0 and 10 per million. As described previously in Section 4.1.2.2, estimated net changes in emissions are probably somewhat overestimated because of the use of default fugitive VOC emission factors, so the net decreases in cancer risks are probably also somewhat overestimated. The maximum noncarcinogenic acute and chronic hazard indices from the model run based on increased emissions were 0.0005 and 0.0166, respectively. These values are well below the significance level of 1.0. Thus, the HRA results indicate that impacts are below the SCAQMD significance criteria.

4.1.5 Potential Health Risks from Diesel Exhaust Particulate Matter

The project will lead to increased emissions of diesel exhaust particulate matter during construction and operation. In 1998, the CARB listed particulate matter in the exhaust from diesel-fueled engines (diesel particulate matter) as a toxic air contaminant and concluded that it is probably carcinogenic to humans. An Advisory Committee was formed to advise the CARB staff in its preparation of an assessment of the need to further control toxic air pollutants from diesel-fueled engines. The Risk Management Subcommittee was formed to identify the: (1) operating parameters; (2) emission factors; and (3) modeling methodologies recommended for estimating human health risks from diesel-fueled engines. This information will be used to develop the scenarios to evaluate the risks associated with exposure to diesel particulate emissions. The SCAQMD is waiting for this guidance before initiating a requirement for quantitative risk analyses for diesel particulate emissions.

Significant impacts associated with exposure to diesel particulate emissions are not expected during operation of the proposed project. Total tanker truck exhaust PM_{10} emissions from the 44 daily truck round trips are estimated to be only three pounds per day, which occur over a total distance of about 2,300 miles. The maximum emissions at any single location will occur in the vicinity of the Hathaway Terminal, because all of the tanker trucks leave that location. The emission rate for one truck at a speed of 25 mph is about 0.6 grams per mile. Therefore, the total emissions from 88 tanker trucks (44 leaving and 44 returning) travelling over one-quarter mile out of or into the terminal would only be about 13 grams, or 0.03 pounds per day.

4.1.6 Carbon Monoxide Impacts Analysis

Increases in traffic from a project might lead to impacts of CO emissions on sensitive receptors if the traffic increase worsens congestion on roadways or at intersections. An analysis of these impacts is required if:

1. The project is anticipated to reduce the level of service (LOS) of an intersection rated C or worse by one for level, or
2. The project is anticipated to increase the volume-to-capacity ratio of an intersection rated D or worse by two percent.

As indicated in the transportation/traffic impacts analysis (Section 4.6), the volume-to-capacity ratio at the 223rd and Alameda/Wardlow Access intersection, which currently is rated D+, may increase by 0.03 from construction worker traffic leaving LAR at the end of the working day. This increase is a result of increased traffic in the eastbound direction on 223rd Street. This is the only intersection that meets either of the above criteria during either construction or operations.

Figure 5-1 of the SCAQMD CEQA Handbook (1993) defines sensitive receptors as:

- Long-term health care facilities
- Rehabilitation centers
- Convalescent centers
- Retirement homes
- Residences
- Schools
- Playgrounds
- Child care centers
- Athletic facilities

As indicated in the existing land use and planning description (Section 3.4), the area in the vicinity of the intersection is manufacturing, which precludes the presence of any sensitive receptors. Therefore, the potential increase in congestion at this intersection during construction is not anticipated to lead to adverse carbon monoxide impacts on sensitive receptors.

4.1.7 Mitigation Measures

4.1.7.1 Construction Mitigation Measures

As indicated in the previous summary tables, construction activities may have significant unmitigated air quality impacts for CO, VOC, NO_X and PM_{10}. The emissions from construction are primarily from three main sources: 1) on-site fugitive dust, 2) off-road mobile source equipment, and 3) on-road motor vehicles. The mitigation measures listed below are intended to minimize the emissions associated with these sources.

Table 4.1-14 lists mitigation measures for each emission source and identifies the estimated control efficiency of each measure. As shown in the table, no feasible mitigation has been identified for the emissions from on-road vehicle trips. Additionally, no other feasible mitigation measures have been identified to further reduce emissions. CEQA Guidelines §15364 defines feasible as ". . . capable of being accomplished in a successful manner within a reasonable period if time, taking into account economic, environmental, legal, social, and technological factors."

Table 4.1-15 presents a summary of overall peak daily mitigated construction emissions. The table includes the emissions associated with each source and an estimate of the reductions associated with mitigation. The implementation of mitigation measures, while reducing emissions, does not reduce the construction-related CO, VOC, NO_X or PM_{10} impacts below significance.

Table 4.1-14
Construction-Related Mitigation Measures and Control Efficiency

Mitigation Measure Number	Mitigation	Source	Pollutant	Control Efficiency (%)
AQ-1	Increase watering of active site by one time per day[a]	On-Site Fugitive Dust PM_{10}	PM_{10}	16
AQ-2	Wash wheels of vehicles leaving ~~unimproved areas~~ the facility	On-Site Fugitive Dust PM_{10}	PM_{10}	Not Quantified
AQ-3	Remove all visible roadway dust tracked out onto paved surfaces from unimproved areas at the end of the workday	On-Site Fugitive Dust PM_{10}	PM_{10}	Not Quantified
AQ-4	Prior to use in construction, the project proponent will evaluate the feasibility of retrofitting the large off-road construction equipment that will be operating for significant periods. Retrofit technologies such as selective catalytic reduction, oxidation catalysts, air enhancement technologies, etc. will be evaluated. These	Construction Equipment	CO VOC NO_X SO_x PM_{10}	Unknown Unknown Unknown Unknown Unknown

	technologies will be required it they are commercially available and can feasibly be retrofitted onto construction equipment.			
AQ-5	Proper equipment maintenance	Construction Equipment Exhaust	CO VOC NO_X SO_x PM_{10}	5 5 5 5 5
	No feasible measures identified[b]	On-Road Motor Vehicles	CO VOC NO_X PM_{10}	N/A N/A N/A N/A

[a] It is assumed that construction activities will comply with SCAQMD Rule 403 – Fugitive Dust, by watering the site two times per day, reducing fugitive dust by 50 percent. This mitigation measure assumes an incremental increase in the number of times per day the site is watered (i.e., from two to three times per day)

[b] Health and Safety Code §40929 prohibits the air districts and other public agencies from requiring an employee trip reduction program making such mitigation infeasible. No feasible measures have been identified to reduce emissions from this source.

Table 4.1-15
Overall Peak Daily Construction Emissions (Mitigated)

Source	CO lb/day	VOC lb/day	NOx lb/day	SOx lb/day	Exhaust PM10 lb/day	Fugitive PM10 lb/day	Total PM10 lb/day
On-Site Construction Equipment Exhaust	321.9	66.5	608.4	53.7	34.4		34.4
Mitigation Reduction (%)	0%	5%	5%	5%	5%		
Mitigation Reduction (lb/day)	0.0	-3.3	-30.4	-2.7	-1.7		-1.7
Remaining Emissions	**321.9**	**63.2**	**578.0**	**51.0**	**32.6**		**32.6**
On-Site Motor Vehicles	98.2	13.3	48.8	0.0	2.3	132.2	134.5
Mitigation Reduction (%)	0%	0%	0%	0%	0%	0%	
Mitigation Reduction (lb/day)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Emissions	**98.2**	**13.3**	**48.8**	**0.0**	**2.3**	**132.2**	**134.5**
On-Site Fugitive PM10						20.0	20.0
Mitigation Reduction (%)						16%	
Mitigation Reduction (lb/day)						-3.2	-3.2
Remaining Emissions						**16.8**	**16.8**

Asphaltic Paving		0.5					
Mitigation Reduction (%)		0%					
Mitigation Reduction (lb/day)		0.0					
Remaining Emissions		**0.5**					
Architectural Coating		24.0					
Mitigation Reduction (%)		0%					
Mitigation Reduction (lb/day)		0.0					
Remaining Emissions		**24.0**					
Total On-Site	**420.1**	**100.9**	**626.8**	**51.0**	**35.0**	**149.0**	**184.0**
Off-Site Motor Vehicles	335.8	45.2	89.0	0.0	1.6	55.1	56.7
Mitigation Reduction (%)	0%	0%	0%	0%	0%	0%	
Mitigation Reduction (lb/day)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Emissions	**335.8**	**45.2**	**89.0**	**0.0**	**1.6**	**55.1**	**56.7**
TOTAL	**755.9**	**146.1**	**715.8**	**51.0**	**36.6**	**204.1**	**240.7**
Significance Threshold	*550*	*75*	*100*	*150*			*150*
Significant? (Yes/No)	**Yes**	**Yes**	**Yes**	No			**Yes**

Note: Sums of individual values may not equal totals because of rounding

4.1.7.2 Operational Mitigation Measures

The project NO_x, SO_x, CO, and PM_{10} emission increases are below the emissions significance criteria thresholds applied to this project. However, operational VOC emissions are anticipated to exceed the significance criterion. These increased VOC emissions are primarily due to butane and pentane loading into railcars at LAR, pentane loading into marine tankers, the new pentane storage tank at Marine Terminal No. 2, and loading ethanol into tanker trucks at the Hathaway terminal.

Project operational emissions from other sources will be substantially reduced through the application of BACT, which, by definition, is the lowest achievable emission rate. For example, except for the valves exempt from BACT, the new valves to be installed will be of the bellow-seals (leakless) variety.

The VOC exceedance does not include the actual emission reductions that will result from the storage of lower vapor pressure gasoline at the refinery and terminals. Although the actual reductions will occur, the potential emissions that could occur, based on current permit levels, are greater; therefore, the reductions are not considered in this CEQA analysis. It also should be noted that the specific VOCs that increase as a result of the project were evaluated as part of a health risk assessment and, based on their composition, are not anticipated to create localized human health risks.

ARCO will reduce VOC emissions ~~by at least 42 pounds per day,~~ to below the significance threshold. As VOCs are precursor to ozone, and therefore of regional concern, there are a variety of mitigation measures and strategies available. Prior to the operation of the project ARCO will internally develop or purchase emission offsets. This will reduce peak daily operational VOC emissions to 55 pounds per day or less.

4.1.8 AQMP Consistency

CEQA requires that projects must be consistent with regional and local plans. The 1997 AQMP and the 1999 amendments to the AQMP demonstrate that the standards can be achieved within the required timeframes. This project must comply with applicable SCAQMD requirements and control measures for new or modified sources. It must also comply with prohibitory rules, such as Rule 403, for the control of fugitive dust. By meeting these requirements, the project will be consistent with the goals and objectives of the AQMP. Furthermore, the production of CARB Phase 3 RFG will result in emission reductions from motor vehicles throughout the South Coast Air Basin as well as improvements in water quality associated with the removal of MTBE from gasoline.