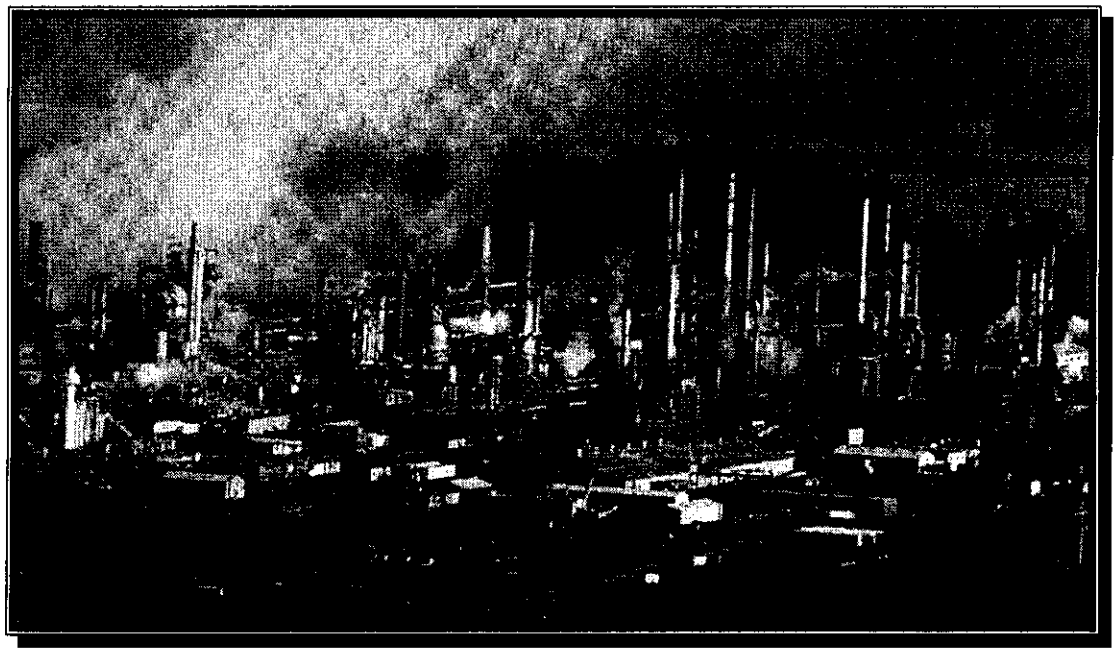
California Environmental Protection Agency
Air Resources Board

Assessment of the Local and Regional Emission Impacts from California Phase 2 Reformulated Gasoline and Related Clean Fuels Refinery Modifications



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State of California
California Environmental Protection Agency
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I. SUMMARY

Today's gasoline, known as California Phase 2 Reformulated Gasoline, or CaRFG2, was introduced in 1996. In California, nearly all of the CaRFG2 consumed is produced by refineries in the South Coast Air Quality Management District (SCAQMD), the Bay Area AQMD (BAAQMD), and the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD)[1].

This document is an assessment performed by staff of the Air Resources Board (ARB) on the emission impacts of introducing CaRFG2. This assessment includes a consideration of both the emission benefits of the program and the emission impacts of the associated refinery modifications necessary to produce CaRFG2. There is also included in this report an assessment of emissions from refineries over the period 1990 through 1999 in these three air districts.

An assessment of the emissions associated with current refinery projects to produce California Phase 3 Reformulated Gasoline, or CaRFG3, are not included in this document since these projects are not yet completed.

A. Overall Findings

Since its implementation, the CaRFG2 program has provided very significant reductions in ozone and particulate matter precursor emissions and toxic air pollutants. The emission benefits of this program have been equivalent to the removal of 3.5 million vehicles from California's roads, and are a major component of California's plan for achieving both the federal and state ambient air quality standards. The emission reductions from CaRFG2 represent about one quarter of the emission reductions committed to in the 1996 State Implementation Plan. Table I-1 shows the criteria pollutant emission benefits of the CaRFG2 program in the SCAQMD, BAAQMD, and the SJVUAPCD.

In order to produce CaRFG2, California refineries underwent significant modifications from 1992-1998 spending about 4 billion dollars on capital equipment and improvements. These modifications included retooling of existing equipment and processes, as well as installation of new equipment. In performing these modifications, the permitted emissions from the refineries changed. In some instances, these changes resulted in some increases in permitted emissions. In other cases, the change resulted in a reduction in permitted emissions. In all cases, the change in permitted emissions from refineries as a result of the CaRFG2 modifications was small. In the context of the overall CaRFG2 program, any increases in permitted emissions from refineries (see Appendix A for CaRFG2 refinery emissions) were greatly overshadowed by the emission benefits of the CaRFG2 program.

[1] Within this document, the SCAQMD, BAAQMD and SJVUAPCD will collectively be known as the "districts".

Table I-1:
Emission Benefits and Impacts of the CaRFG2 Program

District	Emission Type	ROG (tpd)	NO_x (tpd)	CO (tpd)	SO_x (tpd)	PM_{10} (tpd)
SCAQMD	CaRFG2 Benefits	-42	-25	-439	-10	[2]
	Impacts of Implementing CaRFG2[1]	1.2	1.4	0.7	0.6	0.4
BAAQMD	CaRFG2 Benefits	-26	-11	-208	-5	[2]
	Impacts of Implementing CaRFG2[1]	-0.3	0.3	1.4	0.6	0.1
SJVUAPCD	CaRFG2 Benefits	-9	-6	-105	-3	[2]
	Impacts of Implementing CaRFG2[1]	0.1	0.1	0.1	0.1	0

[1] Includes both direct and indirect emission impacts
[2] It was estimated that the CaRFG2 reductions in NO_x and SO_x would significantly reduce the formation of PM_{10}.

Table I-1 shows the changes in emissions within each of the three air districts as a result of implementing the CaRFG2 modifications. The changes in emissions include both changes in permitted emissions from the refineries (known as stationary source emission impacts) and changes in emissions from truck, marine, and employee traffic (known as indirect source emission impacts). As can be seen in Table I-1, when the emission impacts of the CaRFG2 modifications are compared to the emission benefits of the CaRFG2 program in each of the three districts, the CaRFG2 program emission benefits are up to 400 times greater than any emission impacts.

B. Change in Emissions from CaRFG2 Producing Refineries

The changes in emissions of criteria pollutants for CaRFG2 projects from the California Environmental Quality Act (CEQA) are presented in Table I-2 for each of the three air districts. Based on CEQA and air district permitting information, many of the CaRFG2 refinery modifications resulted in a relatively slight increase in permitted emissions from refineries in the SCAQMD and SJVUAPCD. For example, in the SCAQMD while the introduction of CaRFG2 in 1996 increased refinery emissions of ROG by 0.9 tpd, overall ROG refinery emissions still declined by 19 tpd in the period from 1990 to 1999. This is because while modifications were made to existing equipment which generally served to reduce emissions from these units, at some facilities additional new equipment which was not previously in operation was also installed, resulting in relatively slight emission increases from some facilities. However, in the BAAQMD, the permitted emission increases from refineries were limited to CO emissions.

The emission reductions shown in Table I-2 for refineries are a result of increased stringency of local air district rules and regulations applicable at refineries, as well as from the replacement or modifications of older equipment throughout the last decade with newer, cleaner units. In evaluating this trend towards lower emissions for these

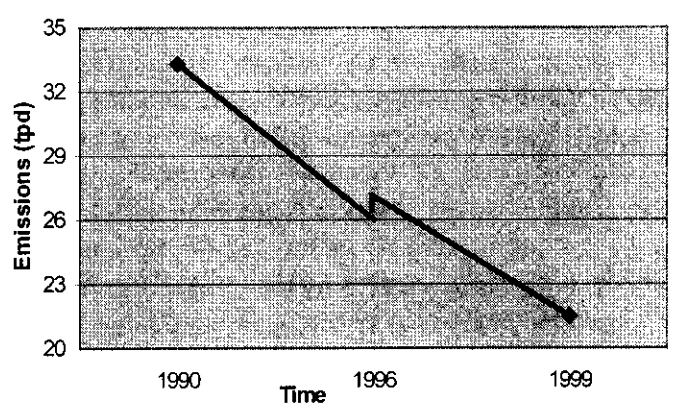
refineries, it is important to note that they occurred during a time of overall growth in gasoline production of 10 percent and an increase in California gasoline consumption of 8 percent.

Because of the increases in emissions from the CaRFG2 projects, refinery emissions as a whole may not have decreased as much as possible had the CaRFG2 projects not occurred. As can be seen in Table I-2, the increases in permitted emissions from the CaRFG2 refinery modifications did not significantly impact the overall emission reduction trends from CaRFG2 producing refineries. However, outside of the BAAQMD, the CaRFG2 projects somewhat reduced the emission reductions achieved over this period. Figure I-1 further illustrates the overall downward emissions trend during the period from 1990-1999. The graph represents the general decrease in nitrogen oxides (NOx) in the South Coast Air Basin, despite the slight increase in emissions attributable to the implementation of the CaRFG2 refinery modifications, as indicated in 1996.

Table I-2:
Change in Emissions from CaRFG2 Producing Refineries (1990-1999)

District	Emission Type	ROG (TPD)	NO_x (TPD)	CO (TPD)	SO_x (TPD)	PM_{10} (TPD)
SCAQMD	Change in Refinery Emissions from1990-1999	-19	-12	3	6	-3
	Impact of CaRFG2 Refinery Emissions	0.9	0.5	0.4	0.5	0.3
BAAQMD	Change in Refinery Emissions from1990-1999	-6	-10	-3	-8	-0.4
	Impact of CaRFG2 Refinery Emissions	-0.3	-0.1	1.6	-0.1	0
SJVUAPCD	Change in Refinery Emissions from1990-1999	-1	-4	0	-1	1
	Impact of CaRFG2 Refinery Emissions	0.1	0.1	0.1	0.1	0

Figure I-1:
Refinery NO_x Emission Trend in the South Coast Air Basin 1990-1999



C. Regional Emission Impacts

As previously discussed, the use of CaRFG2 in gasoline powered motor vehicles has provided very significant reductions in emissions of precursors for both ozone and particulate matter and emissions of toxic air pollutants. However, the production of CaRFG2 has necessitated changes in the movement of materials and components to produce CaRFG2 at California refineries. Changes in emissions from these sources, known as indirect sources, are generally mobile source related and include changes in marine, rail, truck, and employee traffic. These emission changes also include impacts from offsite stationary sources, such as power plant emissions from increased electrical demand. As shown in Table I-3, generally, there was an increase in the annual daily average emissions from indirect sources associated with the CaRFG2 projects in the three air districts.

Table I-3:
Regional Emission Impacts of CaRFG2
(Annual Daily Average)

District	Emission Type	ROG (TPD)	NO_x (TPD)	CO (TPD)	SO_x (TPD)	PM_{10} (TPD)
SCAQMD	CaRFG2 Emission Benefits	-42	-25	-439	-10	[1]
	CaRFG2 Indirect Source Impacts	0.3	0.9	0.3	0.1	0.1
BAAQMD	CaRFG2 Emission Benefits	-26	-11	-208	-5	[1]
	CaRFG2 Indirect Source Impacts	0	0.4	-0.2	0.7	0.1
SJVUAPCD	CaRFG2 Emission Benefits	-9	-6	-105	-3	[1]
	CaRFG2 Indirect Source Impacts	0	0	0	0	0

1 It was estimated that the significant CaRFG2 reductions in NO_x and SO_x would significantly reduce the formation of PM_{10}.

Because the CaRFG2 program must comply with the federal requirements, nearly all of the gasoline sold in southern California contains oxygenates. Oxygenates are compounds designed to reduce emissions of carbon monoxide (CO) from motor vehicles. In complying with these federal requirements, most refiners chose to use methyl tertiary butyl ether, or MTBE. With the introduction of CaRFG2, MTBE use in California more than doubled, with much of the MTBE arriving at refineries via marine shipments. Also, in complying with the CaRFG2 requirements, some refiners chose to increase imports of certain gasoline blending components such as alkylates. These imports also arrived into California through the ports.

Because of the federal oxygenate requirements, the SCAQMD had the largest CaRFG2 indirect source emission impacts. The majority of these emission increases occurred in the Long Beach and Los Angeles Harbor areas of the SCAQMD, with marine tanker emissions accounting for most of the emission impacts. As shown in Table I-3 the result of the increased marine activity effected both the SCAQMD and BAAQMD.

Oxides of nitrogen, or NO_x increased by 0.9 tpd on average in the SCAQMD and oxides of sulfur, or SO_x increased by 0.7 tpd on average in the BAAQMD. There were also smaller average daily emission increases of indirect sources of less than half a ton per day of reactive organic gases (ROG), and minimal impacts from CO, and particulate matter (PM) emissions in the SCAQMD. Yet, as previously discussed, while there were emission impacts associated with the implementation of the CaRFG2 program, these impacts are small when compared to the very significant benefits the CaRFG2 program provided.

II. INTRODUCTION

This report is an assessment by the staff of the ARB on the local and regional emission impacts associated with the CaRFG2 refinery modifications and related clean fuels projects. These projects, initiated in the early to mid-1990's, provided a means for California refiners to produce gasoline meeting the federal Phase 1 Reformulated Gasoline (RFG) standards and the more stringent CaRFG2 standards.

A. Need for Staff's Assessment of the Emission Impacts Associated with the CaRFG2 Refinery Modifications

Since the implementation of the CaRFG2 regulations in the spring of 1996, some environmental and citizen groups have expressed concerns that they believed that the implementation of CaRFG2 and the related refinery modifications resulted in local adverse emission impacts. As a result, ARB staff began this past year to compile the information necessary to assess the local and regional emission impacts associated with the implementation of the CaRFG2 regulations.

B. Scope of Staff's Evaluation of the Local and Regional Emission Impacts of the CaRFG2 Refinery Modifications

Staff's assessment includes those CaRFG2 and related clean fuels refinery modifications which were undertaken in the early to mid-1990's (1992-1997), as well as an assessment of the change in emissions from CaRFG2 producing refineries over the period of 1990 through 1999. The refineries that were modified to produce CaRFG2 are located in the SCAQMD, BAAQMD, and SJVUAPCD. Staff has reviewed historical documents to assess how these three air districts and local governments mitigated the emission increases from the CaRFG2 refinery modifications under the then existing emission regulations and CEQA requirements. Also, staff has attempted to gather the information available to assess the emissions impacts associated from indirect sources such as marine and rail traffic and increased truck and employee traffic.

III. CALIFORNIA'S GASOLINE REFINERIES AND GASOLINE REQUIREMENTS

In this chapter, staff provides information on which California refineries produce CaRFG2 and the specifications for gasoline in California.

A. California Refineries That Produce CaRFG2

In California, twelve major refineries and one small refinery made the necessary refinery modifications to produce CaRFG2. Those refineries are shown in Table III-1. The refineries that produce CaRFG2 are located in the:

- SCAQMD – (Los Angeles County)
- BAAQMD – (Contra Costa County and Solano County)
- SJVUAPCD – (Kern County)

Table III-1:
California Refineries that Currently Produce CaRFG2

South Coast Air Quality Management District		
Refinery	Location	History of Ownership
British Petroleum (BP)	Carson	ARCO
ChevronTexaco	El Segundo	No recent changes
Shell	Wilmington	Equilon / Texaco
ExxonMobil	Torrance	Mobil
ConocoPhillips	Wilmington and Carson	Tosco / Unocal
Valero	Wilmington	Ultramar Diamond Shamrock
Bay Area Air Quality Management District		
Refinery	Location	History of Ownership
ChevronTexaco	Richmond	No recent changes
Shell	Martinez	Equilon
ConocoPhillips	Rodeo	Phillips / Tosco / Unocal
Tesoro	Avon (Martinez)	Phillips / Tosco / Ultramar Diamond Shamrock
Valero	Benicia	Exxon
San Joaquin Valley Unified Air Pollution Control District		
Refinery	Location	History of Ownership
Shell	Bakersfield	Equilon / Texaco
Kern Oil	Bakersfield	No recent changes

B. Gasoline Requirements in California

The production of gasoline in California is governed by both state and federal requirements.

1. California Requirements

California has adopted three modifications to our gasoline regulations since 1989 that make-up California's reformulated gasoline regulations. The expected emissions benefits of these three regulations were a reduction of about 400 tpd of hydrocarbons, 129 tpd of NO_x, 34 tpd of SO_x, 1300 tpd of CO, and a 37 percent reduction in toxics. The controls implemented in California's first reformulated gasoline regulation, the Phase I program in 1992 included lowering the Reid vapor pressure (RVP) from 9.0 to 7.8 psi, a requirement for the addition of deposit control additives, and the elimination of leaded gasoline in California.

Shown in Table III-2 are the specifications established in the second modification to California's reformulated gasoline regulations, the CaRFG2 regulations. This modification resulted in a comprehensive set of specifications designed to achieve maximum reductions in criteria and toxic pollutants and in the mass and reactivity (ozone-forming potential) of emissions from gasoline fueled vehicles. These regulations were approved by the ARB in 1991 and were implemented statewide in 1996. The CaRFG2 regulations have different sets of limits depending on how the refinery chooses to comply with the regulations. However, the cap limits may not be exceeded.

Table III-2:
CaRFG2 Specifications

Property Limits	Units	Flat Limits	Averaging Limits	Cap Limits (1)
Reid vapor pressure	psi, max	7.0	---	7.0
Benzene	vol %, max	1.00	0.80	1.20
Sulfur	ppmw, max	40	30	80
Aromatic Hydrocarbons	vol %, max	25	22	30
Olefins	vol %, max	6.0	4.0	10
Oxygen	wt %	1.8 to 2.2	---	1.8 (min)(2) 3.7 (max) (3)
T50	°F, max	210	200	220
T90	°F, max	300	290	330

(1) The "cap limits" apply to all gasoline at any place in the marketing system and are not adjustable.
(2) The 1.8 weight percent minimum applies only during the winter and only in certain areas.
(3) If the gasoline contains more than 3.5 weight percent but nor more than 10 volume percent ethanol, the cap is 3.7 weight percent.

The CaRFG2 regulations have provided very significant reductions in ozone and particulate matter precursor emissions and toxic air pollutants. The emission benefits of the program have been equivalent to removing 3.5 million vehicles from California's roads. The CaRFG2 regulations are also a major component of California's plan for achieving both the federal and state ambient air quality standards.

The California Phase 3 Reformulated Gasoline (CaRFG3) regulations are expected to be fully implemented in 2004 and are intended to eliminate the use of MTBE in California while retaining the emission benefits of CaRFG2 gasoline.

2. Federal Requirements

California gasoline production is also governed by federal regulations. The United States Environmental Protection Agency (U.S. EPA) also has enacted federal RFG regulations. Nationally, about 30 percent of the gasoline produced must meet these requirements. These regulations impose emission performance standards in conjunction with specific requirements for oxygen content (year-round average of 2.0 percent by weight), and limits on benzene content. The federal requirements were implemented in two phases. The first phase began in 1995 and the second phase began in December 1999. In the September 15, 1999 Federal Register, the U.S. EPA made the finding that the emission reduction benefits of California gasoline are at least as great as those from federal Phase II RFG.

For California, the federal RFG regulations were first implemented in 1995 in the South Coast and San Diego and in 1996 in the Sacramento Metropolitan Region. The South Coast, San Diego, and Sacramento areas of the State account for about 70 percent of the gasoline sold in California. Further, the San Joaquin Valley was recently reclassified by U.S. EPA as a "severe" ozone nonattainment area and must comply with federal RFG requirements beginning in December of 2002. With the San Joaquin Valley included in the federal RFG program, approximately 80 percent of the gasoline sold in California must meet both the federal and the more stringent state gasoline requirements.

IV. ENVIRONMENTAL REQUIREMENTS FOR CaRFG2 PROJECTS

In this chapter, the air pollution control requirements that were applied to the CaRFG2 and related clean fuels refinery modifications are discussed. An assessment of the emissions associated with the projects needed to implement the CaRFG3 requirements are not included. These projects are not yet complete.

A. Overview

The refinery modifications for CaRFG2 were subject to requirements to assess both local and regional multimedia environmental impacts (i.e., water, air, waste, toxics, etc.). In regards to emission impacts, the primary environmental requirements were the CEQA reviews, local governmental land use requirements, and local district air permitting requirements. Those requirements of CEQA, relating to emission impacts, and air district permitting requirements are discussed in this chapter.

B. CEQA

CEQA requires state and local agencies to identify significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. Appendix B contains an overview of the CEQA process and a simplified CEQA process flowchart. The impetus for CEQA can be traced to the passage of the first federal environmental protection statute in 1969, the National Environmental Policy Act (NEPA). In response to this federal law, the California State Assembly created the Assembly Select Committee on Environmental Quality to study the possibility of supplementing NEPA through state law. Based on the recommendations of the select committee, the legislature passed, and Governor Reagan signed, the CEQA statute in 1970. Below is a discussion of the key elements of the CEQA process that directly effected the CaRFG2 refinery projects.

1. South Coast Air Quality Management District

The SCAQMD assumed lead agency responsibility for the CEQA review of the six refineries in the district that planned to comply with the CaRFG2 regulations. In the case of the refineries located in the South Coast, each refinery submitted a letter to their respective responsible local governmental agencies requesting that the SCAQMD serve as lead agency. Refineries based their requests on the rationale that the CaRFG2 refinery modifications were largely focused on emission related issues. The affected local government agencies in the South Coast included the cities of Los Angeles, Torrance, El Segundo, and Carson. Each of these local governments agreed with the refineries and sent letters to the SCAQMD asking the air district to assume the lead

agency responsibility for the CaRFG2 refinery projects. Examples of these letters are provided in Appendix E.

As lead agency, the SCAQMD prepared the Notice of Preparation (NOP) and the Initial Studies to determine the need and preparation of an EIR for each of the refineries in the district. After the completion of the NOP, the SCAQMD determined that each of the South Coast refineries would need to prepare EIRs.

2. Bay Area Air Quality Management District

The BAAQMD chose to serve as a cooperating or responsible agency rather than act as the lead agency for CEQA for the CaRFG2 refinery modifications in their jurisdiction. In its role as a responsible agency, the BAAQMD provided ongoing technical assistance to the city and county governments that served as the lead agencies for Bay Area CaRFG2 refinery projects. The City of Richmond served as lead agency for Chevron (Richmond), the City of Benicia served as lead agency for Exxon (now Valero), the City of Hercules served as lead agency for Pacific Refinery (which was later shutdown), and Contra Costa County served as lead agency for Shell, Tosco (now Tesoro), and Unocal (now Phillips). Letters on the BAAQMD's position to serve as a cooperating agency, and an example of a local Bay Area government agency agreeing to be the lead agency and requesting the BAAQMD to be a cooperating agency are provided in Appendix F.

3. San Joaquin Valley Unified Air Pollution Control District

The SJVUAPCD served as lead agency for the Texaco (now Shell) and Kern Oil Refining CaRFG2 refinery projects.

C. California's Air Permit Requirements

California's emission permit programs for new and modified stationary sources are referred to as New Source Review (NSR) programs. NSR programs, adopted by air districts, consist of regulations and requirements that govern the building and expansion of stationary sources. Stationary sources are industrial or commercial facilities which emit air contaminants. Typical stationary sources include oil refineries, power generation plants, automobile manufacturers, food processors, and auto body painters (California Health and Safety Code Sections 42300 et seq provide for district permitting program requirements). Mobile sources, such as trucks and automobiles, are not regulated under NSR programs.

The purpose of NSR is to provide the regulatory mechanism to allow continued industrial growth in nonattainment areas while minimizing the amount of emission increases from this growth. The California Clean Air Act (CCAA) mandates that the

purpose of NSR is to keep emission levels from the permitting of new and modified stationary sources at a constant level; in other words, to allow no increase in emissions.

1. NSR Requirements for Emission Control Equipment

Under the NSR program, districts evaluate the potential emission increases from new and modified stationary sources. Using California NSR, the CaRFG2 Clean fuels projects were subject to district review of their applications for modifications or additions to their facilities. If emission increases are above specified levels, the district requires the source to apply best available control technology (BACT) to control those emissions. While reviewing these applications, the districts determined the use of BACT for the new or modified equipment. Examples of CaRFG2 refinery modifications and their BACT requirements (determinations), at that time, are provided in Table IV-1. Appendices G and H provide detailed descriptions of the SCAQMD and BAAQMD BACT determinations, respectively.

Any remaining emissions after the utilization of BACT would need to be offset. The districts did not issue permits to begin construction until the CEQA process and mitigation requirements had been completed.

Table IV-1:
Examples of CaRFG2 "BACT Determinations"

Refinery Modification	Pollutant	BACT Control
Furnaces	NO_x	Low NO_x Burners with SCR and ammonia injection
Boilers	NO_x	Low NO_x Burners with SCR and ammonia injection
Heaters	NO_x	Low NO_x Burners with SCR and ammonia injection
Storage Tanks	VOC	Fixed roof tanks connected to a vapor recovery system.
Pumps	VOC	Seal-less pumps with dual seals with barrier fluids. Dry running seals vented to a closed system. Double mechanical seals with barrier fluid and vented to a vapor recovery system.
Valves	VOC	Bellows sealed valves for sizes 2" or smaller. Valves 3" or larger utilized API/ANSI design.
Flanges	VOC	Designed in accordance with ANSI B 16.5-1998 pipe fittings and flanged fittings.
Pressure Relief Valves	VOC	Vented to a closed system.

After BACT is applied, the project's remaining emission levels are then compared to another specified level called the offset threshold. Offsets are required to mitigate any emission increases remaining after BACT has been applied. These offset requirements

are usually at a ratio greater than one (e.g., a 100 pound per day emissions increase may have to be offset by 110 pounds of emission reductions).

The existing NSR program has been successful in the sense that emission increases have been minimized through the application of BACT. In addition, the program's offset requirements have been the driving force behind technological advances resulting in more effective emission control equipment and techniques in order to reduce emission increases to levels below the offset threshold.

2. Emission Offset Requirements

Offsets are emission reductions at the project location or at a nearby location used to compensate for the expected increase in emissions from the project. When a source reduces its emissions, beyond what is required under NSR, it can receive credit for those reductions, called emission reduction credits (or ERC's) which can be sold at a future date or used by the facility to offset future projects.

In most scenarios, stationary sources with new or modified projects that have remaining emissions after BACT is applied, generally consider the following options to provide offsets:

- Reduce emissions on-site at other units at the facility either by downsizing or shutting other existing process units at the facility.
- Reduce emissions off-site at the owner's nearby or distant units that are associated with the facility.
- Purchase ERC's from another facility that has emission reductions from previous downsizing or unit shutdowns.

The vast majority of CaRFG2 projects obtained the necessary offsets by downsizing, applying advanced control technology, or by achieving on-site emission reductions at their facilities.

D. Offset Exemptions

The SCAQMD and the SJVUAPCD chose to exempt certain new and modified CaRFG2 stationary source projects from their district offset requirements. The CaRFG2 and related clean fuels projects were provided with offset exemptions when the associated emission increases were the result of complying with federal, state, or local air quality mandates - in this case the state's mandated CaRFG2 regulations. The BAAQMD required emission offsets for CaRFG2 projects in their district.

1. Federal Clean Air Act Amendments of 1990 (Section 182(e)(2))

The Federal Clean Air Act Amendments (CAAA) of 1990 included section 182(e)(2), which provides state and local agencies in extreme ozone nonattainment areas the authority to exempt projects from offset requirements for emission increases resulting from compliance with federal, state, and local air quality mandates. Appendix I contains the complete text of CAAA section 182(e)(2) which states:

> "Offset requirements... shall not be applicable in extreme areas to a modification of an existing source if such modification consists of installation of equipment required to comply with the applicable implementation plan, permit, or this Act."

This section provided specific authority to the SCAQMD, a federal extreme ozone non-attainment area, to exempt CaRFG2 refinery modifications from their offset requirements.

2. California State Law

Subsequent to the approval of the federal CAAA, California law was amended to provide similar offset exemption provisions for compliance with air quality mandates. California Heath and Safety Code (HSC) section 42301.2 provides that:

> "A district shall not require emission offsets for any emission increase at a source that results from the installation, operation, or other implementation of any emission control device or technique used to comply with a district, state, or federal emission control requirement, including, but not limited to, requirements for the use of reasonably available control technology or best available retrofit control technology, unless there is a modification that results in an increase in capacity of the unit being controlled." (Added by Stats. 1996, Chapter 771, Section 5).

The full text of HSC section 42301.2 is provided in Appendix J. Under the California provisions, districts could exempt the CaRFG2 refinery modifications from offset requirements as long as there was no increase in the refinery capacity.

3. SCAQMD Rule 1304(e)(4)

Just prior to refineries submitting CaRFG2 project proposals, the SCAQMD approved Rule 1304(e)(4) which provided an offset exemption for projects which must comply with district, state, or federal air pollution control laws, rules, regulations or orders, as approved by the Executive Officer or his designee, and provided there was no increase

in maximum rating (in the case of refineries, no increases in refinery capacities). A copy of Rule 1304 is provided in Appendix L.

In 1992, California refiners were concerned about their ability to meet the CaRFG2 compliance date of March 1996. In particular, they were concerned about how long CEQA and permitting reviews and approvals would take. In the case of air permitting, refineries in southern California held preliminary discussions with the U.S. EPA and the SCAQMD on an exemption for offsets of emissions resulting directly from CaRFG2 refinery modifications. In initial discussions, U.S. EPA had raised concerns about the SCAQMD's offset exemption provision in Rule 1304(b)(4). Subsequent to these discussions, the SCAQMD issued a letter on October 9, 1992 which underscored the District's position of support for the offset exemption provided under Rule 1304(b)(4), as long as the modifications could be demonstrated to be necessary to comply with the CaRFG2 requirements and did not result in capacity increases. On December 14, 1992, U.S. EPA Region IX issued a letter indicating that after meetings with the SCAQMD, they agreed that the Rule 1304(b)(4) exemption could be used once the SCAQMD modified its Regulation XIII (New Source Review rule) to include an emission tracking system to account for and mitigate the CaRFG2 refinery modifications emissions increases. An emission tracking system is a facility accounting of emission increases and decreases. It allowed credit toward future emission reductions against the remaining CaRFG2 refinery modifications emission increases. Copies of the correspondence between U.S. EPA and the SCAQMD regarding emission offsets for the CaRFG2 projects are contained in Appendix K.

As a result, the SCAQMD approved offset exemptions (under Rule 1304(b)(4)) for unmitigated refinery project emissions that were necessary to directly comply with the CaRFG2 regulations. Some of the CaRFG2 projects also included other modifications (such as refinery expansions) which were not directly related to the CaRFG2 regulations or any other mandates. Emission increases that were related to refinery expansions were subject to the SCAQMD's offset requirements.

V. CaRFG2 REFINERY MODIFICATIONS

In this chapter, staff will discuss the various types of CaRFG2 refinery modifications that were performed during the CaRFG2 modifications.

A. General Types of CaRFG2 Refinery Modifications

To produce CaRFG2 and comply with federal RFG gasoline requirements, California refineries made a number of common refinery modifications.

In performing these modifications, California refineries invested approximately four billion dollars. To produce these fuels, these modifications necessarily increased the complexity and energy consumption of these refineries. A flow diagram of a typical California refinery and the "typical" refinery modifications necessary to produce CaRFG2 is provided in Figure V-1 (The shaded units represent those modifications to produce CaRFG2). Some of the more common refinery modifications designed to meet key CaRFG2 limits were to build or expand:

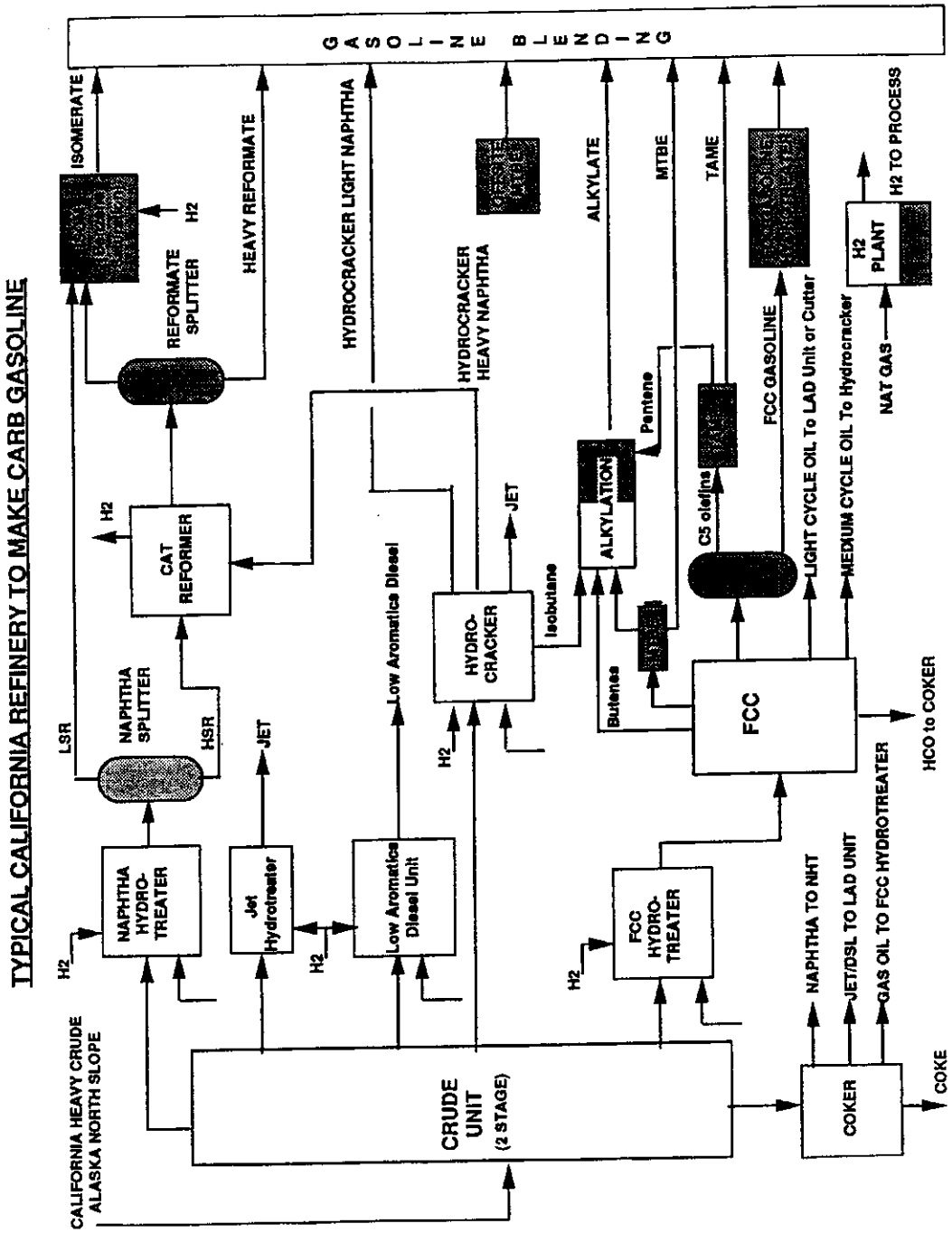
1) improved control of the distillation process to meet the RVP limits,
2) hydrotreaters to meet the sulfur and olefin limits,
3) increased capacity for hydrogen production, and
4) Fluid Catalytic Cracking (FCCU) and Hydrocracking units to provide more gasoline blendstock and produce additional feedstocks for alkylation and oxygenate plants.

Alkylation plants were built or expanded to increase gasoline supply by converting "light ends" (i.e., propane and butane) to alkylate which is a gasoline blendstock. Alkylate is a high octane, low vapor pressure gasoline blending component that essentially contains no olefins, aromatics, or sulfur.

Oxygenate plants to produce MTBE and tertiary amyl methyl ether (TAME), another oxygenate, were built to provide a blending additive that increases the oxygen content of gasoline to comply with both federal and California oxygenate requirements. Some refineries built these units to have on-site production of oxygenates rather than to import oxygenates or to use this on-site production to supplement their oxygenate imports and to comply with the federal oxygenate requirement.

With the large-scale refinery modifications came increased complexity and increased demands for energy (i.e. electricity and steam) in order for California refineries to produce CaRFG2. As a result, some refineries looked on-site or at nearby facilities for their increased energy needs. Some refineries proposed the use of on-site cogeneration facilities to produce additional energy.

FIGURE V-1


TYPICAL CALIFORNIA REFINERY TO MAKE CARB GASOLINE
GASOLINE BLENDING
ISOMERATE
H2
REFORMATE SPLITTER
HEAVY REFORMATE
HYDROCRACKER LIGHT NAPHTHA
HYDROCRACKER HEAVY NAPHTHA
ALKYLATE
MTBE
TAME
H2 PLANT
H2 TO PROCESS
NAT GAS
FCC GASOLINE
LIGHT CYCLE OIL To LAD Unit or Cutter
MEDIUM CYCLE OIL To Hydrocracker
Pentane
C5 olefins
ALKYLATION
CAT REFORMER
JET
Isobutane
Butenes
FCC
HCO to COKER
Low Aromatics Diesel
HYDRO-CRACKER
NAPHTHA SPLITTER
LSR
HSR
NAPHTHA HYDRO-TREATER
Jet Hydrotreater
Low Aromatics Diesel Unit
FCC HYDRO-TREATER
NAPHTHA TO NHT
JET/DSL TO LAD UNIT
GAS OIL TO FCC HYDROTREATER
CALIFORNIA HEAVY CRUDE
ALASKA NORTH SLOPE
CRUDE UNIT (2 STAGE)
COKER
COKE

B. Specific CaRFG2 Refinery Modifications

Each refinery that decided to produce CaRFG2 initiated refinery modifications based on the unique needs of their particular refinery; no two refineries were identical in their CaRFG2 projects. The specific needs of each refinery were based on the types of equipment a particular refinery operated, the type of crude oil it processed, the capacities of the various refinery units, and the make-up of the refinery product slate. As a result, no two refineries needed the same types of modifications to produce CaRFG2.

However, there were a number of modifications that were "common" to many of the refineries which were modified to comply with the CaRFG2 regulations. The major new or modified units many refineries (identified by their names at that time) proposed to produce CaRFG2 are shown in Table V-1. A brief narrative of each of the major types of CaRFG2 refinery modifications is provided in Appendix M.

Appendices N and O, respectively, provide a summary and a detailed matrix of the SCAQMD refineries CaRFG2 and related clean fuels refinery modifications.

Appendices P and Q, respectively, provide a summary and a detailed matrix of the BAAQMD refineries CaRFG2 and related clean fuels refinery modifications.

Table V-1:
Overview of CaRFG2 Refinery Modifications

Refinery	FCCU	Reformer	Hydro-cracker	Hydro-treater	Alkyl-ation	Isomer-ization (C4-C6)	Butamer	Hydro-gen	MTBE or TAME	Storage Tanks	Cogen-eration
South Coast Air Quality Management District											
ARCO	X	X	X		X	X		X		X	
Chevron		X		X	X	X		X	X		X
Mobil	X		X		X			X		X	
Texaco	X	X	X		X	X		X	X	X	
Ultramar	X	X			X	X	X	X	X	X	X
Unocal			X		X		X	X		X	X
Bay Area Air Quality Management District											
Chevron	X				X		X		X	X	
Exxon		X	X		X	X		X	X	X	
Shell		X		X	X	X		X		X	X
Tosco			X		X	X		X	X	X	
Unocal						X		X		X	
San Joaquin Valley Unified Air Pollution Control District											
Texaco			X	X				X	X		
Kern Oil		X								X	

VI. DATA COLLECTION AND ANALYSIS

This chapter provides the methodology staff used in collecting and analyzing the data available for staff's assessment of the local and regional emission impacts from both stationary and indirect sources associated with the CaRFG2 and related clean fuels refinery modifications.

A. Data Collection

Staff's assessment of the local and regional emission impacts of the CaRFG2 and related clean fuels projects was designed to determine the change in local permitted stationary and indirect source emissions associated with these projects, and the types of mitigation, if any, that occurred in conjunction with these projects. Staff's assessment is based on environmental and permitting information from this period, and includes:

- CEQA information;
- Air permit information;
- Authority-to-construct documents;
- Land use permits, and;
- Conversations with air district staff and refinery personnel.

The process to develop this assessment began with ARB staff gathering existing information on CaRFG2 and related clean fuels refinery projects in the Spring of 2001. This information included:

SCAQMD ARB staff worked with district staff to obtain the available letters of notification of "intent to issue authority-to-construct permits" under SCAQMD Rule 212, authority-to-construct permits, and permit-to-operate information related to the CaRFG2 and clean fuels refinery modifications. In addition, SCAQMD district staff provided ARB staff with copies of all the CaRFG2 refinery CEQA documents ARB staff did not already possess.

BAAQMD ARB staff obtained CEQA information from the local governments who served as lead agencies (i.e., City of Richmond, City of Benicia, and Contra Costa County) and authority-to-construct permit information from the BAAQMD regarding the CaRFG2 and clean fuels refinery modifications.

SJVUAPCD ARB staff obtained copies of both the CEQA and authority-to-construct permit information issued for the CaRFG2 refinery modifications at Shell (formerly Equilon and Texaco-Bakersfield) and Kern Oil Refining of Bakersfield.

ARB staff worked very closely with district and local government staff (for CEQA information in the Bay Area) to collect all of this information. District and local government staff also helped compile and evaluate the information collected and provided critical review of staff's findings. District and local government staffs' were also very helpful in providing follow up information and answering any questions. Staff of the ARB sincerely appreciate the resources and efforts provided by the air districts and local governments in the development of this document.

B. Data Analysis

Upon completion of staff's data collection efforts, staff began evaluating the impacts of the CaRFG2 refinery projects by analyzing the DEIRs and FEIRs issued in conjunction with these projects. These documents provided an overview of the CaRFG2 projects planned by each refinery. The EIRs contained baseline emission inventories for the refineries (typically in the 1990-1994 timeframe), proposed refinery modifications, and estimates for stationary, transportation, and other activity emissions. In addition, these documents identified proposed control measures and any mitigation measures that may have been required. Based on the CEQA documentation, ARB staff was able to establish preliminary emission impacts from the CaRFG2 refinery modifications.

ARB staff also reviewed available air district permitting information on the CaRFG2 and related clean fuels projects. This information included authority-to-construct permits and in some cases, operating permits. In addition, staff also evaluated any other available documents to develop emission estimates for permitted stationary sources and indirect sources associated with CaRFG2 and related clean fuels refinery modifications.

Generally, the CaRFG2 and clean fuels projects initially proposed in the DEIRs were larger in scale than the modifications that were actually constructed and operated. In most cases, refinery planning staff developed their initial projects based on conservative estimates of refinery needs to ensure the refinery would be able to comply with the CaRFG2 requirements. However, through the development process, refiners were able to continually optimize their proposed modifications to better meet the needs of their particular refinery. As a result, as the projects approached the permitting and construction phases, they were typically downsized in scale from what had been originally proposed.

Upon completion of staff's initial analysis, staff requested the local air districts and the individual refiners review these emissions estimates. Based on air district and industry

comments, final permitted emission estimates were developed for the CaRFG2 and related clean fuels refinery modifications.

It is important to recognize that the emission impacts identified in staff's analysis are "permitted emissions" and represent potential to emit levels. Permitted emissions are generally higher than the "actual emissions levels" typically reported in refinery and air district emission inventories. Also, the change in permitted emissions does not reflect any emission reductions obtained since these projects were completed, from either refinery projects or increased stringency of air district rules. Staff's evaluation is limited to identifying what emissions were allowed under CEQA and air district permitting requirements.

VII. CaRFG2 LOCAL AND REGIONAL EMISSION IMPACTS IN THE SCAQMD

In this chapter, staff provides an assessment of the overall changes in emissions from CaRFG2 producing refineries since 1990, including the localized emission impacts associated with implementing the CaRFG2 regulations. Staff also provides an estimate of the regional emission benefits of the CaRFG2 program in the SCAQMD, including the impacts of indirect source emissions to produce CaRFG2.

A. Change in Emissions From CaRFG2 Producing Refineries

Emissions from CaRFG2 producing refineries have generally decreased as a result of new air pollution control regulations at refineries, as well as replacement of older, dirtier equipment with newer, less polluting equipment. The decrease in emissions since 1990 has occurred despite the fact that the CaRFG2 modifications resulted in small increases in permitted emissions from these refineries.

Table VII-1 shows the emission reductions from the CaRFG2 producing refineries in the SCAQMD over the period 1990 through 1999 and the associated changes in permitted emissions from the CaRFG2 refinery modifications. It is important to note that the impact from the stationary source's new and modified equipment already reflects emission reductions associated with the application of BACT. Normally under NSR, the remaining emissions would need to be offset by other mitigating factors. However, the SCAQMD allowed these emissions increases without requiring offsets based on application of SCAQMD Rule 1304(b)(4). Under SCAQMD Rule 1304(b)(4), any resulting net emissions, after the application of BACT, due to refinery additions and modifications that were required in order to comply with federal, state, and local mandate were exempt from requiring offsets. As can be seen in Table VII-1, the small emission increases in permitted emissions did not significantly impact the emission decreases from CaRFG2 producing refineries. Overall, if these CaRFG2 refinery modifications in the SCAQMD had not occurred, even greater emission reductions from refineries may have been achieved

Table VII-1:
Change in Emissions from CaRFG2 Producing Refineries in SCAQMD (1990-1999)

Emission Impacts	ROG (TPD)	NO_x (TPD)	CO (TPD)	SO_x (TPD)	PM_{10} (TPD)
Change in 1990-1999 Inventory	-19.2	-11.8	3.0	5.8	-2.6
CaRFG2 Stationary Source Impacts	0.9	0.5	0.4	0.5	0.3

As shown in Table VII-1, the changes in CaRFG2 producing refinery emissions in the 1990's showed a significant decline of about 19 tons per day of ROG and 12 tons per day of NOx, both ozone forming pollutants. PM10 emissions were reduced by slightly over 2 tons per day. However, according to the ARB Emissions Inventory, there were increases in SOx and CO emissions for CaRFG2 producing refineries. However, the SCAQMD is attainment for SOx and only marginally non-attainment for CO.

This trend towards lower emissions for these refineries has occurred during a time of overall growth in gasoline production and significant increases in statewide gasoline consumption. These reductions are a result of increased stringency of local air district rules and regulations applicable at refineries, as well as from the replacement of older equipment with newer, cleaner units.

1. Changes in Emission Inventory

Staff compiled emission inventory data for CaRFG2 producing refineries for the years 1990 and 1999 to evaluate the changes in refinery emissions over this period. As can be seen in Table VII-2, there were substantial changes in emissions from refineries that are currently producing CaRFG2.

Table VII-2:
CaRFG2 Refinery Emissions in SCAQMD (1990-1999)

Year	ROG (TPD)	NO_x (TPD)	CO (TPD)	SO_x (TPD)	PM_{10} (TPD)
1990	28.8	33.3	11.3	14.8	6.0
1999	9.6	21.5	14.3	20.6	3.4
Change	**-19.2**	**-11.8**	**3.0**	**5.8**	**-2.6**

2. Changes in Stationary Source Emissions

ARB staff developed an estimate of the localized stationary source emission changes associated with the CaRFG2 refinery modifications based on both the CEQA and air permit emissions estimates, as well as through additional information provided by individual refiners. Staff's estimate also factored into consideration the application of BACT and any mitigation that occurred in conjunction with these projects.

Based on this information, ARB staff estimates that there was a small increase in permitted emissions from stationary sources in the SCAQMD associated with CaRFG2 and related clean fuels projects. These permitted emissions impacts are presented in Table VII-3.

Table VII-3:
Stationary Source Permitted Emissions
Associated with CaRFG2 Refinery Modifications in SCAQMD

Refinery	Former Name	Location	ROG (lbs/day)	NOx (lbs/day)	CO (lbs/day)	SOx (lbs/day)	PM (lbs/day)
BP	ARCO	Carson	326	156	188	16	211
Chevron	N/A	El Segundo	231	310	160	141	174
Shell	Equilon/ Texaco	Wilmington	31	0	0	0	0
ExxonMobil	Mobil	Torrance	297	90	242	41	64
ConocoPhillips	Tosco/ Unocal	Wilmington and Carson	478	187	84	276	13
Valero	Ultramar	Wilmington	410	171	207	587	123
Stationary Source Emissions Impacts			**1,773**	**914**	**881**	**1,061**	**585**
Convert to Tons Per Day (TPD)			**0.9**	**0.5**	**0.4**	**0.5**	**0.3**

Note: SCAQMD District Rule 1304(b)(4) exempted refinery modifications, directly related to complying with the state's mandate for CaRFG2, from offset requirements.

For the South Coast CaRFG2 refinery modifications and related clean fuels projects, permitted emissions increased primarily because the SCAQMD provided an offset exemption under Rule 1304 (see Appendix K). The SCAQMD's offset exemption was limited to modifications necessary to comply with either the federal or state gasoline requirements (i.e., Federal RFG Phase I and CaRFG2), and were not allowed for increases in capacity or those modifications that were not related to the federal or state mandates.

It is important to note that the emission increases shown in Table VII-3 are changes in permitted emissions, and do not necessarily reflect changes in actual emissions. While these projects resulted in local emission increases, even those projects that were exempt from emission offset requirements still had to meet the district's stringent BACT requirements.

B. Regional Emission Impacts

The use of CaRFG2 has provided very significant regional emission reductions in ozone and particulate matter precursor emissions and toxic air pollutants. The SCAQMD emission benefits from CaRFG2 are shown in Table VII-4. However, the production of CaRFG2 has necessitated changes in the movement of materials and components to produce CaRFG2 at California refineries. Changes in emissions from these sources, known as indirect sources, include changes in marine, rail, truck, and employee traffic. As shown in Table VII-4, there was an increase in emissions in the SCAQMD for nearly all pollutants. However, these impacts are very small in comparison to the regional CaRFG2 benefits.

Table VII-4:
Local and Regional Emission Impacts
Associated with CaRFG2 Refinery Modifications in SCAQMD

Emission Impacts	ROG (TPD)	NO_x (TPD)	CO (TPD)	SO_x (TPD)	PM_{10} (TPD)
CaRFG2 Regional Emission Benefits	-42	-25	-439	-10	*
Indirect Source Emissions from Implementing CaRFG2	0.3	0.9	0.3	0.1	0.1

* No data available
** It was estimated that the significant CaRFG2 reductions in NOx and SOx would significantly reduce the formation of PM_{10}.

1. Indirect Source Emissions

Based upon staff's assessment of the applicable CEQA documentation, staff has determined there were localized emission increases associated with indirect sources.

These localized emission increases were due to a number of factors, including increases in marine and truck traffic as well as increased employee trip emissions. Also, the indirect source emission impacts of the CaRFG2 projects were not just from refineries in the SCAQMD. As is discussed later in Chapter IX, the majority of the indirect source emission increases from refineries in the SJVUAPCD were anticipated to occur within the SCAQMD. Staff has included these emission increases in their evaluation of the SCAQMD indirect source emission impacts. The local estimated indirect emission impacts of the SCAQMD and SJVUAPCD are shown in Table VII-5.

The majority of emission increases identified in Table VII-5 occurred in the Long Beach and Los Angeles Harbor area of the SCAQMD, with marine tanker emissions accounting for most of the indirect source emission increases. These emission increases are attributable to increased imports of MTBE as well as other gasoline blending components such as alkylate. The most significant emission impact from indirect sources is from NO_x (about 1 ton per day). Smaller increases, approximately half a ton per day of ROG, CO, and lesser for SO_x and PM emissions were observed. Significant proportions of the indirect emissions for nitrogen oxides (94%) were due to two main sources, marine traffic and electrical generation. Due to marine traffic being intermittent in nature, the impacts from indirect source emissions were all calculated using an annual daily average in Table VII-5.

Table VII-5:
Regional Emission Impacts from Indirect Source Emissions SCAQMD (Annual Daily Average)

Refinery	Former Name	Location	ROG (lbs/day)	NO_x (lbs/day)	CO (lbs/day)	SO_x (lbs/day)	PM (lbs/day)
BP	ARCO	Carson	43	106	339	169	46
Chevron	N/A	El Segundo	-2	-13	-127	-85	-27
Shell	Equilon/ Texaco	Wilmington	24	837	113	174	36
ExxonMobil	Mobil	Torrance	7	119	13	49	7
ConocoPhillips	Tosco/ Unocal	Wilmington and Carson	478	197	84	-276	13
Valero	Ultramar	Wilmington	10	216	53	56	10
Total Indirect Source Emissions (for SCAQMD refineries only)			**560**	**1,462**	**475**	**87**	**85**
Indirect Source Emissions from SJVUAPCD Refineries			17	137	112	44	10
Total Indirect Source Emissions			**577**	**1,599**	**587**	**131**	**95**
Convert to Tons Per Day (TPD)			**0.3**	**0.9**	**0.3**	**0.07**	**0.05**

2. Local and Regional Emission Benefits of Using CaRFG2

Based upon available CEQA documentation, staff has determined that the local emission benefits of CaRFG2 may have substantially mitigated some of the stationary source emission increases associated with the CaRFG2 and related clean fuels refinery modifications. These estimated local emission benefits are shown in Table VII-6, and are the benefits of using CaRFG2 in and around the refineries in the SCAQMD. CaRFG2 also provided very significant regional emission benefits, as shown in Table VII-7. In many cases, these regional emission benefits served as the rationale for the approval of a "statement of overriding considerations" for some of the CaRFG2 refinery modifications and their associated emission increases.

Table VII-6: CaRFG2 Local Emission Benefits in SCAQMD

ROG (TPD)	NO_x (TPD)	CO (TPD)	SO (TPD)	PM_{10} (TPD)
-0.5	-0.5	No Data	-0.3	N/A

Source: ARCO DEIR - February 1993 - (Tables 1.1-5 and 4.3-11).

Table VII-7: CaRFG2 Regional Emission Benefits in SCAQMD

ROG (TPD)	NO_x (TPD)	CO (TPD)	SO (TPD)	PM_{10} (TPD)
-42	-25	-439	-10	*

Source: ARB, Emissions Benefits Analysis – Phase 2 RFG – January 13, 1993

* No data available. ARB analysis assumed NOx and SOx emissions reductions would provide PM10 emission reductions as well.

VIII. CaRFG2 LOCAL AND REGIONAL EMISSION IMPACTS IN THE BAAQMD

In this chapter, staff provides an assessment of the overall changes in emissions from CaRFG2 producing refineries since 1990, including the localized emission impacts associated with implementing the CaRFG2 regulations. Staff also provides an estimate of the regional emission benefits of the CaRFG2 program in the BAAQMD, including the impacts of indirect source emissions to produce CaRFG2.

A. Change in Emissions for CaRFG2 Producing Refineries

Emissions from CaRFG2 producing refineries have generally decreased as a result of new air pollution control regulations at refineries, as well as replacement of older, dirtier equipment with newer, less polluting equipment. The decrease in emissions since 1990 has occurred despite the fact that the CaRFG2 modifications resulted in small increases in permitted emissions from these refineries.

Table VIII-1 shows the emission reductions from the CaRFG2 producing refineries in the BAAQMD over the period 1990 through 1999 and the associated changes in permitted emissions of the CaRFG2 refinery modifications. As can be seen in Table VIII-1, the increases in permitted emissions did not significantly impact the emission decreases from CaRFG2 producing refineries. The CaRFG2 refinery modifications in the BAAQMD resulted in emission reductions from refineries, except for CO.

Table VIII-1:
Change in Emissions from CaRFG2 Producing Refineries in BAAQMD (1990-1999)

Emission Impacts	ROG (TPD)	NO_x (TPD)	CO (TPD)	SO_x (TPD)	PM_{10} (TPD)
Change in 1990-1999 Inventory	-5.7	-9.8	-3.1	-8.3	-0.4
CaRFG2 Stationary Source Impacts	-0.3	-0.1	1.6	-0.1	0

As shown in Table VIII-1, the changes in CaRFG2 producing refinery emissions in the 1990's showed a significant decline of about 6 tons per day of ROG and 10 tons per day of NOx, both ozone forming pollutants. Also, SOX emissions declined about 8 tons per day. Carbon monoxide and PM10 emissions were reduced by slightly less than 3 tons and 0.5 ton per day, respectively. However, the decline in refinery emissions was reduced over the 1990's by CO emission increases that occurred from the CaRFG2 refinery modifications.

This trend towards lower emissions for these refineries has occurred during a time of overall growth in gasoline production and significant increases in statewide gasoline consumption. These reductions are a result of increased stringency of local air district rules and regulations applicable at refineries, as well as from the replacement of older equipment with newer, cleaner units.

1. Changes in Emissions Inventory

Staff compiled emission inventory data for CaRFG2 producing refineries for the years 1990 and 1999 to evaluate the changes in refinery emissions over this period. As can be seen in Table VIII-2, there were substantial reductions in emissions from refineries that are currently producing CaRFG2 in the Bay Area.

Table VIII-2:
CaRFG2 Refinery Emissions in BAAQMD (1990-1999)

Year	ROG (TPD)	NO_x (TPD)	CO (TPD)	SO_x (TPD)	PM_{10} (TPD)
1990	24.5	45.2	9.6	47.3	2.9
1999	18.8	35.4	6.5	39.0	2.5
Change	**-5.7**	**-9.8**	**-3.1**	**-8.3**	**-0.4**

2. Changes in Stationary Source Emissions

ARB staff developed an estimate of the localized stationary source emission changes associated with the CaRFG2 refinery modifications based, on both the CEQA and air permit emissions estimates as well as through additional information by individual refiners. Staff's estimate also factored into consideration the application of BACT and any other mitigation that occurred in conjunction with those projects. Based on this information, ARB staff estimates that there was no localized emission increases for ROG, NOx, and SOx in permitted emissions from stationary sources in the BAAQMD associated with CaRFG2 and related clean fuels projects. CO emissions may have been the exception, as the BAAQMD's NSR rule allowed stationary sources to "model out" of offset requirements for CO if the increases will not result in a violation of the applicable federal or state ambient air quality standard for CO. Changes in stationary source emissions of PM were nearly neutral. These estimated changes in permitted emissions are presented in Table VIII-3.

Table VIII-3:
Stationary Source Permitted Emissions
Associated with CaRFG2 Refinery Modifications in BAAQMD

Refinery	Former Name	Location	ROG (lbs/day)	NO_x (lbs/day)	CO (lbs/day)	SO_x (lbs/day)	PM_{10} (lbs/day)
Chevron	N/A	Richmond	-95	0	0	0	0
Shell	Equilon	Martinez	-328	-155	1,687	-107	3
ConocoPhillips	Tosco/ Unocal	Rodeo	-37	-12	60	0	42
Tesoro	Ultramar	Avon	-83	-55	971	0	0
Valero	Exxon	Benicia	-22	-18	377	0	0
Stationary Source Emissions Impacts			**-565**	**-240**	**3,095**	**-107**	**45**
Convert to Tons Per Day (TPD)			**-0.3**	**-0.1**	**1.6**	**-.05**	**.02**

B. Regional Emission Impacts

The use of CaRFG2 has provided very significant regional emission reductions in ozone and particulate matter precursor emissions and toxic air pollutants. The BAAQMD emission benefits from CaRFG2 are shown in Table VIII-4. However, the production of CaRFG2 has necessitated changes in the movement of materials and components to produce CaRFG2 at California refineries. Changes in emissions from these sources, known as indirect sources, include changes in marine, rail, truck, and employee traffic. As shown in Table VIII-4, there was an increase in emissions in the BAAQMD for nearly all pollutants. However, these impacts are very small in comparison to the regional CaRFG2 benefits.

Table VIII-4:
Local and Regional Emission Impacts
Associated with CaRFG2 Refinery Modifications in BAAQMD

Emission Impacts	ROG (TPD)	NO_x (TPD)	CO (TPD)	SO_x (TPD)	PM_{10} (TPD)
CaRFG2 Regional Emission Benefits	-26	-11	-208	-5	*
Indirect Source Emissions from Implementing CaRFG2	0	0.4	-0.2	0.7	0.1

* No data available
** It was estimated that the significant CaRFG2 reductions in NOx and SOx would significantly reduce the formation of PM_{10}.

1. Indirect Source Emissions

Based upon staff's assessment of the applicable CEQA documentation, staff has determined there were small, localized emission increases associated with indirect sources in the Bay Area.

These localized emission increases were due to a number of factors, including increases in marine and truck traffic as well as increased employee trip emissions. The local estimated indirect source emission impacts in the BAAQMD are shown below in Table VIII-5. The majority of the emission increases identified in Table VIII-5 occurred in the harbor areas of the Bay Area refineries (Richmond, Rodeo, Martinez, and Benicia). Marine tanker emissions accounted for most of the indirect source emission increases, though rail traffic had some impacts as well. These emission increases are attributable to increased imports of MTBE as well as other gasoline blending components such as alkylate. The most significant emission impacts are for NO_x (about 0.4 tons per day) and SOx (about 0.7 tons per day). Negligible increases of ROG and PM emissions were observed. Due to intermittent nature of these marine loading events, an annual daily average was calculated.

Table VIII-5:
Regional Emission Impacts from Indirect Source Emissions BAAQMD
(Annual Daily Average)

Refinery	Former Name	Location	ROG (lbs/day)	NOx (lbs/day)	CO (lbs/day)	SOx (lbs/day)	PM (lbs/day)
Chevron	N/A	Richmond	-100	-130	-600	-164	-50
Shell	Equilon	Martinez	50	178	109	26	22
ConocoPhillips	Tosco / Unocal	Rodeo	8	43	6	72	6
Tesoro	Ultramar	Avon	54	**665**	101	**1,406**	106
Valero	Exxon	Benicia	2	4	33	1	7
Total Indirect Source Emissions			**14**	**760**	**-351**	**1,341**	**91**
Convert to Tons Per Day (TPD)			**0**	**0.4**	**-0.2**	**0.7**	**0.05**

2. Local and Regional Emission Benefits of Using CaRFG2

Based upon available CEQA documentation, staff has determined that the local emission benefits of CaRFG2 may have substantially mitigated most of the CO stationary source emission increases associated with the CaRFG2 and related clean fuels refinery modifications. These estimated local emission benefits are shown in Table VIII-6 and are the benefits of using CaRFG2 in and around the refineries in the BAAQMD. CaRFG2 also provided very significant regional emission benefits, as shown in Table VIII-7. In many cases, these regional emission benefits served as the rationale for the approval of a "statement of overriding considerations" for some of the CaRFG2 refinery modifications and their associated emission increases.

Table VIII-6:
CaRFG2 Local Emission Benefits in Contra Costa County and City of Benicia

ROG (TPD)	NO_x (TPD)	CO (TPD)	SO_x (TPD)	PM_{10} (TPD)
-3	-2	-29	-1	-1

Table VIII-7:
CaRFG2 Regional Emission Benefits in BAAQMD

ROG (TPD)	NO_x (TPD)	CO (TPD)	SO_x (TPD)	PM_{10} (TPD)
-26	-11	-208	-5	*

Source: CARB, Emissions Benefits Analysis – Phase 2 RFG – January 13, 1993.
* No data available. ARB analysis assumed NOx and SOx emissions reductions would provide PM10 emission reductions as well.

IX. CaRFG2 LOCAL AND REGIONAL EMISSION IMPACTS IN THE SJVUAPCD

In this chapter, staff provides an assessment of the overall changes in emissions from CaRFG2 producing refineries since 1990, including the localized emission impacts associated with implementing the CaRFG2 regulations. Staff also provides an estimate of the regional emission benefits of the CaRFG2 program in the SJVUAPCD, including the impacts of indirect source emissions to produce CaRFG2.

A. Change in Emissions for CaRFG2 Producing Refineries

Emissions from CaRFG2 producing refineries have generally decreased as a result of new air pollution control regulations at refineries, as well as replacement of older, dirtier equipment with newer, less polluting equipment. The decrease in emissions since 1990 has occurred despite the fact that the CaRFG2 modifications resulted in small increases in permitted emissions from these refineries.

Table IX-1 shows the emission reductions from the CaRFG2 producing refineries in the SJVUAPCD over the period 1990 through 1999 and the associated changes in permitted emissions from the CaRFG2 refinery modifications. As can be seen, the small increases in permitted emissions did not significantly impact the emission decreases from CaRFG2 producing refineries.

Table IX-1:
Change in Emissions from CaRFG2 Producing Refineries in SJVUAPCD (1990-1999)

Emission Impacts	ROG (TPD)	NO_x (TPD)	CO (TPD)	SO_x (TPD)	PM_{10} (TPD)
Change in 1990-1999 Inventory	-1	-4	0	-1	1
CaRFG2 Stationary Source Impacts	0.1	0.1	0.1	0.1	0

As shown in Table IX-1, the changes in CaRFG2 producing refinery emissions in the 1990's showed a decline of about 1 ton per day of ROG and 4 tons per day of NOx, both ozone forming pollutants. Also, SOx emissions declined about 1 ton per day while PM10 emissions increased by about 1 ton per day. There was relatively no change in CO emissions over this period.

This trend towards lower emissions for these refineries has occurred during a time of overall growth in gasoline production and significant increases in statewide gasoline

consumption. These reductions are a result of increased stringency of local air district rules and regulations applicable at refineries, as well as from the replacement of older equipment with newer, cleaner units.

1. Changes in Emissions Inventory

Staff compiled emission inventory data for CaRFG2 producing refineries for the years 1990 and 1999 to evaluate the changes in refinery emissions over this period. As can be seen in Table IX-2, there were substantial changes in emissions from refineries that are currently producing CaRFG2.

Table IX-2:
CaRFG2 Refinery Emissions in SJVUAPCD (1990-1999)

CaRFG2 Refineries	ROG (TPD)	NO_x (TPD)	CO (TPD)	SO_x (TPD)	PM_{10} (TPD)
1990	1.8	5.5	0.8	2.2	0.1
1999	0.9	1.3	0.6	1.2	1.2
Change	**-0.9**	**-4.2**	**-0.2**	**-1.0**	**1.3**

2. Changes in Stationary Source Emissions

ARB staff developed an estimate of the localized stationary source emission changes associated with the CaRFG2 refinery modifications based on both the CEQA and air permit emissions estimates as well as through additional information provided by the SJVUAPCD. Staff's estimate also factored into consideration the application of BACT and any other mitigation that occurred in conjunction with those projects.

Based on this information, ARB staff estimates that there was a very small localized emission increase in permitted emissions from stationary sources in the SJVUAPVD associated with CaRFG2 and related clean fuels projects. These permitted emissions estimates are presented in Table IX-3. The permitted emission increases in the SJVUAPCD were small and below the air district's CEQA and offset thresholds. Therefore, these emissions were not subject to the district's offset requirements.

Table IX-3:
Stationary Source Permitted Emissions
Associated with CaRFG2 Refinery Modifications in SJVUAPCD

Refinery	Former Name	Location	ROG (lb/day)	NO_x (lb/day)	CO (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)
Shell	Equilon/ Texaco	Kern Co.	260	228	215	104	18
Kern Oil	N/A	Kern Co.	7	19	6	0	0
Stationary Source Emissions Impacts			**267**	**247**	**221**	**104**	**18**
Convert to Tons Per Day (TPD)			**0.1**	**0.1**	**0.1**	**0.05**	**0**

B. Regional Emission Impacts

The use of CaRFG2 has provided very significant regional emission reductions in ozone and particulate matter precursor emissions and toxic air pollutants. The SJVUAPCD emission benefits from CaRFG2 are shown in Table IX-4. However, the production of CaRFG2 has necessitated changes in the movement of materials and components to produce CaRFG2 at California refineries. Changes in emissions from these sources, known as indirect sources, include changes in marine, rail, truck, and employee traffic. As shown in Table IX-4, there were minimal or insignificant increases in emissions in the SJVUAPCD for all pollutants.

Table IX-4:
Local and Regional Emission Impacts
Associated with CaRFG2 Refinery Modifications in SJVUAPCD

Emission Impacts	ROG (TPD)	NO_x (TPD)	CO (TPD)	SO_x (TPD)	PM_{10} (TPD)
CaRFG2 Regional Emission Benefits	-9	-6	-105	-3	*
Indirect Source Emissions from Implementing CaRFG2	0	0	0	0	0

* No data available
** It was estimated that the significant CaRFG2 reductions in NO_x and SO_x would significantly reduce the formation of PM_{10}.

1. Indirect Source Emissions

Based on staff's assessment of the applicable CEQA documentation, there was essentially no change in indirect source emissions associated with the implementation of the CaRFG2 regulations in the SJVUAPCD, as presented in Table IX-5. Although the CEQA documentation for the Shell (formerly Texaco & Equilon) refinery estimated indirect source emission impacts associated with importing alkylate and MTBE, the EIR

documentation assumed 65 percent of those indirect source emissions would occur within the SCAQMD (primarily Long Beach Harbor) from marine tanker, diesel truck, and rail traffic to transport gasoline blending components to Bakersfield. As previously discussed, these impacts were included in Chapter VII regarding the indirect emissions in the SCAQMD.

Table IX-5:
Regional Emission Impacts from Indirect Source Emissions SJVUAPCD (Annual Daily Average)

SOURCE	ROG (lbs/day)	NO_x (lbs/day)	CO (lbs/day)	SO_x (lbs/day)	PM (lbs/day)
Marine Avg. Daily Emissions (Avg. Annual Emissions)*	8.8	72.21	4.928	40.456	5.00
Locomotive Emissions in the SJVUAPCD**	2.15	6.67	49.04	3.72	1.07
Diesel Trucks***	12.37	99.13	164.43	5.4	8.14
Electrical (1 MW-HR of energy)	0.01	1.51	0.2	0.12	0.04
TOTAL	**23.33**	**179.52**	**218.60**	**49.70**	**14.25**
Indirect Emissions that Occurred in SCAQMD	15.16	116.69	142.09	32.30	9.26
Net Indirect Emissions in SJVUAPCD	**8.2**	**62.8**	**76.5**	**17.4**	**5.0**
Convert to Tons Per Day (TPD)	**0**	**0.03**	**0.04**	**0**	**0**

Source: Texaco (Bakersfield) Refinery Reformulated Fuels Project Draft EIR, Volume I – January 1995, prepared by Environmental Audit. SCH No. 93082088.

As previously mentioned in Chapter VII, a significant source of the indirect emissions can be attributed to an increase in truck traffic into Bakersfield transporting the marine tanker imports.

2. Local and Regional Emission Benefits of Using CaRFG2

Staff was unable to locate the necessary information to be able to quantify the local CaRFG2 emission benefits around the SJVUAPCD refineries. However, consistent with the SCAQMD and BAAQMD, staff believes that the use of CaRFG2 provided significant emission benefits to the local area. This conclusion is based on the significant regional emission benefits that CaRFG2 provided in the SJVUAPCD, as shown in Table IX-6.

Table IX-6:
CaRFG2 Regional Emission Benefits in SJVUAPCD

ROG (TPD)	NO_x (TPD)	CO (TPD)	SO_x (TPD)	PM_{10} (TPD)
-9	**-6**	**-105**	**-3**	*

* No data available.

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APPENDIX A

CaRFG2 REFINERY EMISSIONS

1990 Versus 1999

Appendix A:

CaRFG2 Refinery Emissions by Air District

SCAQMD 1990-1999
CaRFG2 Refinery Emissions

CaRFG2 Refineries	ROG (TPY)	NO_x (TPY)	CO (TPY)	SO_x (TPY)	PM_{10} (TPY)
1990	8,939.1	10,977.5	4,037.2	4,767.5	2,057.2
1999	3,523.2	7,849.8	5,215.8	7,505.4	1,252.9
EMISSION CHANGES	**-5,415.9**	**-3,127.7**	**+1,178.6**	**+2,737.9**	**-804.3**

BAAQMD 1990-1999
CaRFG2 Refinery Emissions

CaRFG2 Refineries	ROG (TPY)	NO_x (TPY)	CO (TPY)	SO_x (TPY)	PM_{10} (TPY)
1990	8,927.2	16,506.4	3,499.4	17,248.2	1,070.4
1999	6,859.5	12,919.3	2,352.6	14,218.4	928.1
EMISSION CHANGES	**-2.067.7**	**-3,587.1**	**-1,146.8**	**-3,029.8**	**-142.3**

SJVUAPCD 1990-1999
CaRFG2 Refinery Emissions

CaRFG2 Refineries	ROG (TPY)	NO_x (TPY)	CO (TPY)	SO_x (TPY)	PM_{10} (TPY)
1990	642.3	1,993.7	305.4	790.5	40.4
1999	343.3	465.7	202.7	435.8	435.4
EMISSION CHANGES	**-299.0**	**-1,528.0**	**-102.7**	**-354.7**	**+395.0**

CaRFG2 Emissions for Each Refinery
SCAQMD

(Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php)

SCAQMD 1990
CaRFG2 Refinery Emissions

CaRFG2 Refineries	ROG (TPY)	NO_x (TPY)	CO (TPY)	SO_x (TPY)	PM_{10} (TPY)
ARCO (BP)	2,264.1	2,102.2	183.7	1,918.9	500.8
Chevron	2,546.5	3,036.8	2,414.3	832.3	613.3
Mobil (Exxon-Mobil)	1,061.0	1,740.5	559.4	255.7	274.7
Texaco (Equilon)	1,268.7	1,699.4	346.4	545.8	129.1
Ultramar	349.0	332.7	174.7	340.9	163.3
Unocal (Phillips) Wilmington/Carson* (*1993 data)	1,450.5	2,065.9	358.7	873.4	376.0
TOTAL	**8,939.1**	**10,977.5**	**4,037.2**	**4,767.5**	**2,057.2**

SCAQMD 1999
CaRFG2 Refinery Emissions

CaRFG2 Refineries	ROG (TPY)	NO_x (TPY)	CO (TPY)	SO_x (TPY)	PM_{10} (TPY)
ARCO (BP)	472.0	1,484.0	1,595.0	2,315.0	310.5
Chevron	806.2	1,650.0	1,676.7	1,208.1	227.3
Mobil (Exxon-Mobil)	701.3	1,663.1	869.3	1,017.5	215.3
Texaco (Equilon)	536.4	1,018.7	175.7	952.9	130.5
Ultramar	208.3	329.2	85.3	619.6	152.6
Unocal (Phillips) Wilmington/Carson	799.0	1,704.8	813.8	1,392.3	216.7
TOTAL	**3,523.2**	**7,849.8**	**5,215.8**	**7,505.4**	**1,252.9**

SCAQMD 1990-1999
CaRFG2 Refinery Emissions

CaRFG2 Refineries	ROG (TPY)	NO_x (TPY)	CO (TPY)	SO_x (TPY)	PM_{10} (TPY)
1990	8,939.1	10,977.5	4,037.2	4,767.5	2,057.2
1999	3,523.2	7,849.8	5,215.8	7,505.4	1,252.9
EMISSION CHANGES	**-5,415.9**	**-3,127.7**	**+1,178.6**	**+2,737.9**	**-804.3**

CaRFG2 Emissions for Each Refinery
BAAQMD

(Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php)

BAAQMD 1990
CaRFG2 Refinery Emissions

CaRFG2 Refineries	ROG (TPY)	NO_x (TPY)	CO (TPY)	SO_x (TPY)	PM_{10} (TPY)
Chevron	3,120.3	4,733.6	1,187.9	1,291.3	280.8
Exxon (Valero)	1,082.7	2,975.1	492.3	4,922.2	181.0
Shell (Equilon)	2,276.3	4,403.2	1,350.8	2,790.2	294.4
Tosco (Ultramar)	1,666.6	2,952.1	274.4	7,660.4	254.0
Unocal (Phillips)	781.3	1,442.4	194.0	584.1	60.2
TOTAL	**8,927.2**	**16,506.4**	**3,499.4**	**17,248.2**	**1,070.4**

BAAQMD 1999
CaRFG2 Refinery Emissions

CaRFG2 Refineries	ROG (TPY)	NO_x (TPY)	CO (TPY)	SO_x (TPY)	PM_{10} (TPY)
Chevron	2,510.6	2,609.7	437.9	1,243.9	176.4
Exxon (Valero)	505.3	3,243.3	538.9	5,778.6	185.8
Shell (Equilon)	1,687.1	3,299.1	807.6	1,158.7	362.9
Tosco (Ultramar)	1,543.2	2,606.5	346.2	5,422.7	160.5
Unocal (Phillips)	613.3	1,160.7	222.0	614.5	42.5
TOTAL	**6,859.5**	**12,919.3**	**2,352.6**	**14,218.4**	**928.1**

BAAQMD 1990-1999
CaRFG2 Refinery Emissions

CaRFG2 Refineries	ROG (TPY)	NO_x (TPY)	CO (TPY)	SO_x (TPY)	PM_{10} (TPY)
1990	8,927.2	16,506.4	3,499.4	17,248.2	1,070.4
1999	6,859.5	12,919.3	2,352.6	14,218.4	928.1
EMISSION CHANGES	**-2.067.7**	**-3,587.1**	**-1,146.8**	**-3,029.8**	**-142.3**

CaRFG2 Emissions for Each Refinery
SJVUAPCD

(Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php)

SJVUAPCD 1990
CaRFG2 Refinery Emissions

CaRFG2 Refineries	ROG (TPY)	NO_x (TPY)	CO (TPY)	SO_x (TPY)	PM_{10} (TPY)
Texaco (Equilon)	474.4	1,774.8	270.7	471.2	27.1
Kern Oil	167.9	218.9	34.7	319.3	13.3
TOTAL	**642.3**	**1,993.7**	**305.4**	**790.5**	**40.4**

SJVUAPCD 1999
CaRFG2 Refinery Emissions

CaRFG2 Refineries	ROG (TPY)	NO_x (TPY)	CO (TPY)	SO_x (TPY)	PM_{10} (TPY)
Texaco (Equilon)	124.1	321.2	119.0	72.3	58.2
Kern Oil	219.2	144.5	83.7	363.5	377.2
TOTAL	**343.3**	**465.7**	**202.7**	**435.8**	**435.4**

SJVUAPCD 1990-1999
CaRFG2 Refinery Emissions

CaRFG2 Refineries	ROG (TPY)	NO_x (TPY)	CO (TPY)	SO_x (TPY)	PM_{10} (TPY)
1990	642.3	1,993.7	305.4	790.5	40.4
1999	343.3	465.7	202.7	435.8	435.4
EMISSION CHANGES	**-299.0**	**-1,528.0**	**-102.7**	**-354.7**	**+395.0**

APPENDIX B

CALIFORNIA ENVIRONMENTAL QUALITY ACT:

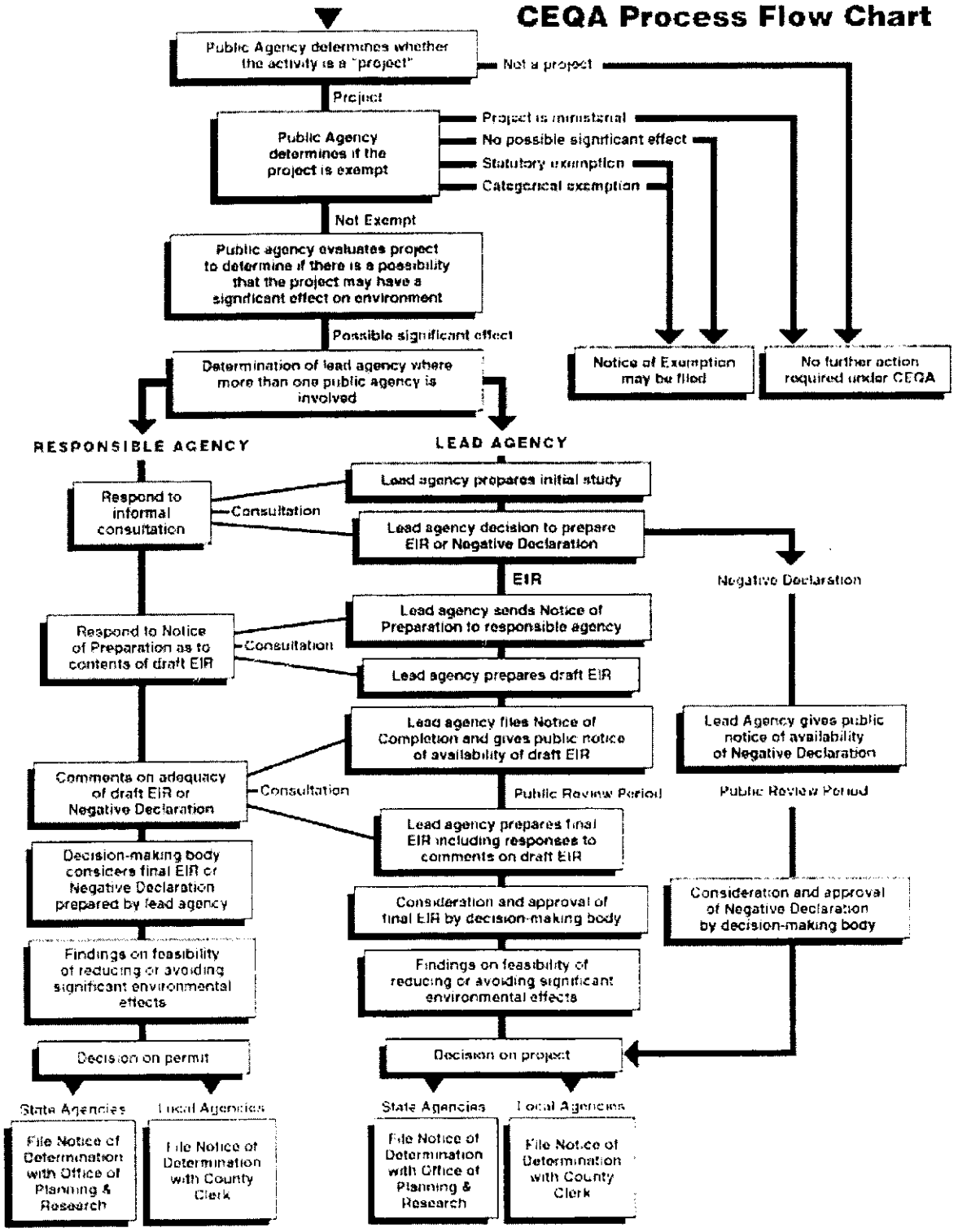
PROCESS FLOW CHART & OVERVIEW OF CEQA PROCESS

CEQA

The California Environmental Quality Act

Credits | Disclaimer

CEQA Process Flow Chart



| CERES | CEQA Home | Environmental Law | LUPIN | Wetlands |

Appendix B:

Overview of CEQA Process

1. Identification of a Lead Agency

The first step in the CEQA process is to identify the lead agency responsible for determining whether significant environmental impacts could occur with a proposed project. If significant environmental impacts are identified above minimum threshold levels, then the lead agency is responsible to oversee the preparation and approval of an environmental impact report (EIR) and to approve appropriate mitigation below these thresholds.

Where a project requires approvals from more than one public agency, CEQA requires one of these public agencies to serve as the "lead agency". The lead agency must complete the environmental review process required by CEQA.

The basic steps of the environmental review process for the lead agency are:

- Determine if the activity is a "project" subject to CEQA.
- Determine if the project is exempt from CEQA.
- Perform an Initial Study to identify the environmental impacts of the project and determine whether the identified impacts are "significant".

Based on its findings of "significance", the lead agency prepares one of the following environmental review documents:

- A Negative Declaration if it finds no "significant" impacts;
- A Mitigated Negative Declaration if it finds "significant" impacts but the project is revised to avoid or mitigate those significant impacts, or;
- An EIR if it finds "significant" impacts from the project based on the Initial Study. The lead agency will prepare a Notice of Preparation (NOP) declaring the need to prepare a Draft Environmental Impact Report for the project with the potential "significant" environmental impacts identified in the NOP.

While there is no one statewide definition of "significance", state law and the State CEQA Guidelines provide criteria to lead agencies in developing local "significance" thresholds and in determining whether a project may have significant environmental effects.

2. Preparation of an EIR

If the lead agency determines, through the Initial Study, that the project may lead to potential significant environmental impacts, then the lead agency must oversee the

preparation of an Environmental Impact Report (EIR). An EIR includes both an initial Draft EIR (DEIR) and a Final EIR (FEIR).

The purpose of a DEIR is to provide State and local agencies and the general public with detailed information on:

- the potentially significant environmental effects which a proposed project is likely to have;
- list ways in which the significant environmental effects may be minimized, and;
- indicate potential alternatives to the project.

The lead agency is also responsible to make the DEIR available for public comment via mailings and public hearings. Upon completion of the public review period, the lead agency is responsible to approve or disapprove the project based on adequacy of the DEIR and the ability of the project proponent to mitigate significant environmental impacts to below significance thresholds.

The lead agency is also responsible for the preparation of the FEIR, which in many cases includes comments and responses to the DEIR. Upon completion of the FEIR, the lead agency certifies the FEIR as complete and in compliance with CEQA. The lead agency then decides whether to approve or disapprove the project based on the significant environmental impacts.

3. Statement of Overriding Considerations

Should the lead agency determine that particular significant environmental impacts are unavoidable with a project, and that the overall benefits of the project outweigh the significant environmental impacts, then the lead agency can approve the project with a "statement of overriding considerations". In the case of many of the CaRFG2 refinery projects, the EIR's were approved with a statement of overriding considerations based primarily on the regional emission benefits that would be derived from the use of CaRFG2 and the associated mobile source emission reductions. As a result, CaRFG2 projects with emission increases (and still considered a significant environmental impact) were approved by the lead agencies with the rationale that the regional emission benefits of CaRFG2 would outweigh the local emission impacts from the CaRFG2 refinery projects.

4. Mitigation and Monitoring Plans

Assembly Bill (AB) 3180 became law in California on January 1, 1989. This law requires all public agencies to approve monitoring or reporting programs when they approve projects with EIRs or Negative Declarations that identify significant environmental impacts that are mitigated below significance thresholds. The reporting and monitoring program must be approved when a public agency makes its findings

under CEQA. The program must be designed to ensure project compliance with mitigation measures during project implementation. If certain project impacts extend beyond the project implementation phase, long-term mitigation monitoring is provided in the monitoring program.

A number of various emission related mitigation measures were agreed to by California refineries that were subject to CaRFG2 CEQA mitigation monitoring plans. Appendix C provides two examples of CaRFG2 mitigation monitoring plans that were agreed upon between Chevron (Richmond) and the City of Richmond, and Unocal (Rodeo), now Phillips Petroleum, and Contra Costa County. Appendix D provides examples of some of the mitigation measures agreed to by California refineries that were supplemental to the local air quality management district requirements. These include:

Chevron's (Richmond) agreement to:

- have proposed spheres include process valves that meet 100 ppm standard (for 1997 equipment) for VOC leaks;
- bellows valves rather than graphite-packed valves, and;
- retrofit tanks built prior to 1979 with low emission fittings.

Phillips' (formerly Unocal – Rodeo) agreement to:

- implement a duct burner option for increased steam production to reduce NO_x emissions.

5. Completion of CEQA

The CEQA process is completed when the lead agency approves the FEIR and a Notice of Determination has been sent out, as well as filing the FEIR with the appropriate agencies. Once the CEQA process is completed, then the permitting process, usually being done parallel with the CEQA process, can be completed as well.

APPENDIX C

EXAMPLES OF CEQA MITIGATION MONITORING PLANS:

CHEVRON AND CITY OF RICHMOND (January 24, 1994), &
TOSCO (NOW ULTRAMAR) AND CONTRA COSTA COUNTY
(November 29, 1994)

CONTRA COSTA COUNTY PLANNING COMMISSION
TUESDAY, NOVEMBER 29, 1994 - 7:30 P.M.

I. INTRODUCTION

TOSCO REFINING COMPANY (Applicant & Owner), County File #2033-93: The applicant requests approval of a land use permit for the Tosco Clean Fuels Project. If approved, the project would involve changes to Tracts 1, 2, 3, & 6 of the Tosco Refining Company's Avon Refinery. The Refinery is located in the unincorporated area east of the City of Martinez and north of the City of Concord. The refinery property is bounded on the west by Pacheco Slough, on the north by Suisun Bay, on the south by Arnold Industrial Way, and on the east by Mallard Reservoir. If approved, the project would involve the construction and operation of seven new units: (1) Mercaptan Extraction/Selective Hydrogenation Plant Unit, (2) Benzene Saturation Unit/Pentane-Hexane Isomerization Unit, (3) Butane Isomerization Unit, (4) Tertiary Amyl Methyl Ether (TAME) or Tertiary Amyl Ethyl Ether (TAEE) Unit, (5) Light Naphtha Hydrodesulferizer (HDS) Unit, (6) Fluid Catalytic Cracking Heart Cut HDS Unit, and (7) Boiler Plant. The project also involves modifications to existing units/refinery components: (1) Reformate Fractionation, (2) #4 Gas Plant Fractionation, (3) Alkylation Plant Expansion and Fractionation, (4) #2 HDS Expansion, (5) #3 HDS Expansion, (6) #1 Hydrogen Plant Expansion, (7) #2 Hydrogen Plant Expansion, (8) Hydrogen Bleed Recovery, (9) MTBE Unit Conversion to TAME, TAEE or ETBE, (10) #5 Gas Plant Fractionation, (11) #1 Hydrodearmoatization Unit, (12) Hydrocracker Upgrade, (13) Flare System Expansion, (14) Air Separation Plant, (15) Logistic Improvements (including 8 new tanks, rebuilding 1 tank, converting 2 existing tanks, and the marine vapor recovery system expansion), (16) Energy Conservation Projects at four existing units, and (17) Modification of the #3 and/or #50 crude unit to allow a crude increase of 12,500 barrels a day.

II. RECOMMENDATIONS

A. Accept any additional public testimony and close the public hearing.

B. Accept the Zoning Administrator's recommendation that the Final EIR should be certified as adequate and complete.

C. Certify that the Final EIR is adequate and complete and that the Commission has reviewed and considered the information contained in the Final EIR prior to making a decision on the project.

D. Approve the land use permit subject to the attached conditions.

E. Adopt the Statement of Findings and Over-riding Considerations and the Mitigation Monitoring Program.

III. DISCUSSION

The project information and staff analysis was provided in the staff report prepared for the November 15, 1994 meeting. The applicant and the County Public Works Department staff have been discussing possible changes to Conditions #36.B through 36.E. The Public Works Department may propose changes to these conditions at the November 29, 1994 hearing. Conditions of Approval #39.C., which was inadvertently omitted, has been added.

The Zoning Administrator's Resolution recommending the certification of the EIR, the Proposed Mitigation Monitoring Program and the Draft Findings are attached.

CK/aa
LUPXXXXV/2033-94A.CK
11/21/94

CONDITIONS OF APPROVAL FOR LAND USE PERMIT #2033-93 (TOSCO REFINING COMPANY - CLEAN FUELS PROJECT)

GENERAL CONDITIONS

1. Development shall be based on the following documents except as modified by the conditions herein:

   A. "Land Use Permit Application" dated received by the County Community Development Department on July 1, 1993.

   B. Submittals completing and/or clarifying the land use permit application dated September 24, 1993; March 23, 1994 and April 13, 1994.

   C. Project development and operation as further described in the Final EIR.

2. Prior to the commencement of grading or construction, the applicant shall submit to the Zoning Administrator for review and approval a Site Development Plan. The Plan shall:

   A. Identify the phasing of the project construction on a quarterly basis. The purpose of this condition is to provide an updated construction schedule which identifies for each major project component, the expected start and completion dates for site preparation and for construction.

   B. Identify the schedule for submitting the Hazard and Operability Studies.

3. An updated copy of the approved Site Development Plan (refer to Condition 2 A/B) shall be submitted to the Zoning Administrator every six months during the duration of the construction period.

4. The applicant shall submit to the Zoning Administrator for review and approval, an annual report detailing the facility's compliance with the conditions of approval and the Mitigation Monitoring Program. The report shall include supporting information from other regulatory agencies as applicable. For each mitigation measure, the report shall identify the compliance with the measure, the procedures or standards used to judge the compliance as applicable, times and dates of the monitoring as applicable and whether further action is required.

NOTE: "MM" refers to the Mitigation Measure in the Final EIR.

5. The Zoning Administrator shall hold a public hearing at a frequency of once each year during the first three years and every three years thereafter to review the applicant's compliance with the land use permit conditions herein. The applicant shall submit a letter to the Zoning Administrator requesting that a hearing be held, and shall pay a fee to cover the hearing costs.

GEOLOGY: SLOPE STABILITY AND EROSION CONTROL

6. At least 20 days prior to the issuance of grading permits, the applicant shall submit to the Zoning Administrator for review and approval an Erosion and Sedimentation Control Plan. The plan shall identify interim measures to prevent erosion and sedimentation during project construction. The measures shall include, but not be limited to the following:(MM 5-3)

   A. Grading to minimize areas of exposed, erodible material, and to avoid over-concentration of rapidly-flowing runoff in unprotected, erodible areas;

   B. Temporary culverts and swales;

   C. Mulch and jute netting blankets on exposed slopes;

   D. Spray slopes with soil stabilizing compounds; and

   E. Sediment traps and/or silt fences.

   The Plan shall also identify measures to prevent long-term erosion during construction activities, including but not limited to the following:

   F. Construction of drainage ditches on cut and fill slopes, and integration of the ditches with the existing or planned storm sewer system;

   G. Erosion control measures such as erosion control fabric, soil stabilizing compounds application, or retaining walls should be used on open cut and fill slopes; and

   H. Periodic inspection and maintenance, as necessary, of cut and fill slopes and sedimentation control facilities during the winter rainy season.

7. Fill used during the construction of the Clean Fuels Project should be properly designed with keyways and subsurface drainage, and adequately compacted (i.e., minimum 90 percent relative compaction as defined by American Society for Testing and Materials (ASTM D1557) to significantly reduce fill settlement). (MM 5-5c)

GEOLOGY: SEISMIC SAFETY

8. At least 20 days prior to the issuance of grading permits or the commencement of construction on any segment of the project, the applicant shall submit to the Zoning Administrator for review and approval a seismic safety report prepared by a California Certified Engineering Geologist or a Geotechnical Engineer. The report shall detail compliance with the following requirements:

A. Grading and design of project elements shall conform to the California Uniform Building Code and the Contra Costa County Code requirements to reduce the secondary effects of ground shaking on structures and infrastructures. (MM 5-5a)

B. The design level investigation shall evaluate subsurface site conditions for each planned improvement. Any areas susceptible to liquefaction, lateral spreading, lurch cracking or differential settlement shall be subject to ground improvement techniques, or other equally effective measures. (MM 5-5b/5-6)

C. The report shall provide settlement estimates for foundations as well as for aboveground and underground utilities. Structures located astride the cut/fill boundary shall be designed to accommodate estimated settlement without failure. (MM 5-5d/5-6)

9. Prior to the issuance of building permits or the commencement of construction for any new structures (foundation and equipment supports), the applicant shall submit to the Zoning Administrator for review and approval satisfactory evidence that the design of the structure has been reviewed by and conforms with the recommendations of the geotechnical engineer/engineering geologist and the structural engineer and meets the following requirements:

A. Modern seismic design shall be used in construction for resistance to strong ground shaking, especially lateral forces. The minimum seismic-resistant design standards for all new project elements shall conform to the California Uniform Building Code Seismic Zone 4 Standards and the Contra Costa County Code requirements

B. Additional seismic-resistant earthwork and construction design criteria shall be incorporated in the project based on the site-specific recommendations of a California Certified Engineering Geologist or Geotechnical Engineer in consultation with the California registered structural engineering professionals. (MM 5-5a)

10. Final design of the proposed improvements shall be consistent with the approved seismic safety report. (MM 5-5e/5-6)

11. Prior to the issuance of grading permits or the commencement of construction for project elements located within the Alquist-Priolo Earthquake Fault Zone, a site-specific fault investigation report shall be completed by a California Certified Engineering Geologist and submitted to the County Zoning Administrator for review and approval. If evidence of a fault trace is found, the report shall recommend foundation design measures, appropriate setbacks, or the relocation of the improvement. (MM 5-4)

WATER QUALITY/CONSERVATION:

12. Prior to the operation of the Light Naphtha Hydrotreater or the Fluid Catalytic Cracking Unit Heart-Cut Naphtha Hydrotreater, or the modification of the Nos. 2 OR 3 Hydrodesulfurizer Units), Tosco shall submit evidence to the satisfaction of the Zoning Administrator that the following requirements have been met:

    A. Design a study to investigate techniques to optimize the clarifier in the wastewater treatment plant for selenium removal.

    B. Submit this study design to the Regional Water Quality Control Board for review and comment. The study design shall include at least the following:

        - Options to be evaluated.
        - Evaluation and monitoring techniques.
        - Reporting schedule.

    C. Submit the final report summarizing the results of the study to the Regional Water Quality Control Board, indicating:

        - Selenium removal efficiencies.
        - Impacts on other characteristics of the wastewater discharge.
        - Reliability of the removal techniques.
        - Recommended future changes in operation of the clarifier.
        - Schedule for subsequent changes in operation of the clarifier.

    D. Identify and implement those changes in the final report which has been approved by the Regional Water Quality Control Board (MM 6-9)

13. The applicant shall use 90 to 100 percent non-potable water for tank testing which substantially reduces construction water demand. Prior to individual tank testing, the applicant shall inform the County Zoning Administrator which of the following measure(s) will be used:

    A. Use of salt water;

    If the Contra Costa Water District develops a supply of reclaimed water that meets the industrial water quality requirements of the Avon Refinery, then Tosco shall take the following actions necessary to accommodate the use of reclaimed water at the facility. (MM 18-10):

1) Prepare an engineering report pursuant to Section 13552.8(a) (4) of the California Water Code, as amended by SB 365 (Statutes of 1993); and

2) Substitute reclaimed water for Contra Costa Canal water for cooling purposes at the Avon Refinery, if it becomes available, is economically feasible and meets the water quality requirements for use at this facility.

B. Use of effluent water and/or fire water;

C. Reuse of test water between tank tests; and

D. Recycling test water for cooling tower make-up water.

14. Tosco shall implement its Spill Prevention, Control, and Countermeasure Plan if a spill of crude oil or gasoline occurs. This plan includes spill containment procedures for the Avon/Amorco Terminals. (MM 7-10)

AIR QUALITY:

15. During project construction, the applicant shall implement the following requirements to reduce fugitive dust (MM 8-1b):

A. All trucks hauling dirt, sand, soil, or other loose materials must be covered and shall maintain at least six inches of freeboard (i.e., minimum required space between top of the load and top of the trailer);

B. Water active sites at least twice daily;

C. Water sites or suspend grading and/or excavating activities when wind speeds (as instantaneous gusts) exceed 25 miles per hour;

D. Water or apply approved chemical soil stabilizers according to manufacturers' specifications to all unpaved parking or staging areas, to unpaved road surfaces, and to inactive construction areas;

E. Replace ground cover in disturbed areas as quickly as possible, if it existed previously;

F. Enclose, cover, water twice daily, or apply approved soil binders, according to manufacturers' specifications to exposed stock piles (e.g. gravel, sand, dirt);

G. Establish a wheel washing station at the construction site exit(s) to prevent entrained dust from leaving the site; and

H. Traffic speeds on all unpaved road surfaces shall be maintained at 15 mph or less.

The Zoning Administrator may waive the requirement to comply with one or more of the above measures upon the finding that the applicant has submitted satisfactory evidence that compliance is not feasible because of associated safety hazards.

16. Prior to the issuance of grading permits or the construction of project elements (e.g. tanks), the applicant shall submit to the Zoning Administrator for review and approval evidence that construction access roads have been paved at least 100 feet on the site from any public roads. (MM 8-1b(c))

17. Prior to the issuance of grading permits or the construction of project elements, the applicant shall submit to the Zoning Administrator for review and approval evidence that construction roads that may have a traffic volume of more than 50 daily trips for all vehicles have been paved. The Zoning Administrator may allow the paving of construction roads to occur at a later time within the construction period based on adequate evidence that construction road use will not exceed the thresholds specified in this condition prior to the completion of the required paving. (MM 8-1b(b)).

18. During construction, the applicant shall implement the following measures to reduce emissions of construction equipment combustion by-products (volatile organic compounds, nitrogen oxide, sulfur oxide, and carbon monoxide). (MM 8-1c)

    A. Prevent trucks from idling longer than two minutes to the extent feasible;

    B. Use electricity from power plants (e.g., power poles) rather than temporary diesel or gasoline power generators to the extent feasible;

    C. Use methanol or natural gas-powered on-site mobile equipment instead of diesel to the extent feasible. Use propane or butane-powered on-site mobile equipment instead of gasoline to the extent feasible;

    D. Use low sulfur fuel (0.05% sulfur content) in diesel powered construction equipment; and

    E. Use low emission on-site mobile equipment:

        - On-road diesel engines, to the extent feasible.
        - Turbochargers and aftercookers, to the extent feasible.
        - Maximum fuel injection timing retard adjustment for equipment without on-road diesel engines.
        - Electric versions of equipment, to the extent feasible.

19. Prior to project operation, the applicant shall provide evidence to the Zoning Administrator for review and approval that one of the following measures has been adopted to ensure that project emissions of carbon monoxide will be mitigated to levels below 100 tons per year and below 500 pounds per day:

A. Do not build the proposed Boiler Plant;

B. Build the proposed Boiler Plant with sufficiently low carbon monoxide emissions such that the project emissions will be less than 100 tons per year and 500 pounds per day;

C. Evaluate emissions of carbon monoxide from the existing refinery and identify and implement additional controls on existing combustion sources; or

D. Substantiate sufficient reductions in the project vicinity due to Tosco's market share of the use of reformulated fuels.

20. Prior to project operation, the applicant shall cease burning coke in the No. 6 boiler and shall only burn fuel oil in the No. 6 boiler as necessary to ensure a reliable supply of fuel during gas interruptions.

21. The applicant shall comply with BAAQMD Regulation 9, Rule 9 for the Alky Gas Turbine by January 1, 1996.

22. Prior to the issuance of building permits or the commencement of construction, the applicant shall provide evidence to the satisfaction of the Zoning Administrator that all contracts with companies involved in the construction of the project include the requirement that daily average vehicle ridership equal not less than 1.15 (BAAQMD) goal for Contra Costa County, 1994). The average daily ridership shall be calculated based upon the definition for construction in BAAQMD Regulation 13, Rule 2. If this average vehicle ridership cannot be achieved, construction companies may propose to Contra Costa County an alternative vehicle ridership plan for implementation. Any alternative vehicle ridership plan must reflect all feasible measures to increase average ridership. (MM 8-1a)

RISK OF UPSET:

23. Prior to the operation of any project element, the applicant shall provide evidence to the satisfaction of the Zoning Administrator that the Emergency Response Plan has been updated to adequately address the new project element.

24. At least 30 days prior to the start-up of the Naphtha HDS Unit, the Ammonia Storage Tank, Tank B, and the Pentane/Butane Sphere, a Hazard and Operability (Hazop) study and accident consequence analysis shall be completed and made available by the applicant for review by the County Health Services Department and for the review and approval of the County Zoning Administrator. The study shall follow the criteria established in American Petroleum Institute Recommended Practice 750 and significance criteria identified in the project EIR. The applicant shall implement specific changes identified by the Hazop study to reduce the severity or probability of significant accidents (MM 11-1/11-2/11-4/11-6)

25. Prior to start-up of the project elements identified in Condition # 24 herein, the applicant shall demonstrate to the satisfaction of the County Health Services Department that the measures detailed in the approved study(ies) have been implemented.

26. Prior to the operation of any project elements which require amendment of the Risk Management and Prevention Plan (RMPP), the applicant shall submit to the County Health Services Department for review and acceptance the revised RMPP.

27. After the project is in operation, but prior to the commencement of any construction to modify any portion of the Clean Fuels Project which has the potential to generate an off-site hazard from a release of acutely hazardous materials, the applicant shall provide written notice to the County Health Services Department and to the County Zoning Administrator and obtain a determination as to whether the change requires a new Hazard and Operability Study.

28. Prior to the start-up for each project element which involves the use of hazardous materials, the applicant shall update the Hazardous Materials Business Plan on file with the County Health Services Department.

29. The applicant shall comply with the applicable requirements of Cal-OSHA to protect employee health and safety.

30. The applicant shall, upon the request of the County, participate with the county and with other industrial businesses in establishing an emergency medical response van which may be used during hazardous materials incidents. The participation may include providing financial assistance to establish the medical response van.

CONSTRUCTION/OPERATION NOISE AND LIGHTING:

31. Noise generating construction activities (e.g., demolition, grading) shall be limited to the hours of 7:00 A.M. to 6:00 P.M., Monday through Saturday, and shall be prohibited on State and Federal holidays which coincide with local building trades holidays. Project construction that occurs during "turnarounds" is not subject to this time and day restriction. Concrete pours begun during the allowed construction period may continue until completion. The unloading of equipment is allowed outside of the specified construction period. However, the Zoning Administrator may, after receipt of complaints from neighboring property owners, restrict unloading activities to 7:00 A.M. to 6:00 P.M., Monday through Saturday. Noise generating construction activities may be allowed on Sundays following written approval by the Zoning Administrator. If the Zoning Administrator allows noise construction activities to occur on a Sunday and holidays, the applicant shall notice property owners within 2000 feet of the construction site.

32. At least one week prior to commencement of grading, the applicant shall mail to the owners of property within 500 feet of the exterior boundary of the refinery notice that construction work will commence. Notice shall also be given to the Pacheco MAC, the Clyde Civic Improvement Association, the East Vine Hill Improvement Association, and

the facility Community Advisory Panel. The notice shall include a list of contact persons with name, title, phone number and area of responsibility. The person responsible for maintaining the list shall also be included. The list shall be kept current at all times and shall consist of persons with authority to implement corrective action in their area of responsibility. The names of the individual responsible for noise and litter control shall be expressly identified in the notice. The notice shall be reissued with each phase of major grading or major construction activity.

33. The project sponsor shall require their contractors and subcontractors to fit all internal combustion engines with mufflers which are in good condition.

34. The applicant shall adopt a noise performance standard to ensure that noise levels generated by Tosco Clean Fuels Project equipment, individually or in combination with existing equipment, will not exceed 80 DBA (Leq), when measured five feet above the ground and 100 feet from the equipment. However, where existing equipment noise levels already approach, equal, or exceed 80 DBA at the monitoring points, the total noise level including noise generated by the Tosco Clean Fuels project equipment shall not increase by more than 3 DBA. (MM 10-3a)

35. After Clean Fuels Project equipment is brought on-line, Tosco shall include this equipment in the noise monitoring program. A set of noise maps shall be generated as part of the noise monitoring program. The noise maps concentrate on noise levels within operating units. These data will need to be supplemented with measurements outside of the operating units. The intent is to conduct the measurements 100 feet from the major vertical planes of the operating units or from a major ancillary noise source. If the new equipment adjoins, or is a modification to existing equipment, the measurement shall be made outside of the boundaries created by the new and existing equipment together. Within ninety (90) days of start-up of individual project units, Tosco shall submit to the Zoning Administrator for review and approval, a report which includes the standard noise maps and supplementary data, identifying the Clean Fuels Project equipment and demonstrating that the equipment noise does not exceed the limits specified in Condition #34. This analysis shall be performed by an individual who is a registered engineer or a member of the Institute of Noise Control Engineering and who has at least five years experience in noise control engineering. If noise from any Clean Fuels Project equipment exceeds the allowable levels, Tosco shall describe the remedial noise control treatments which will be implemented in order to meet the limit or provide evidence that the exceedance does not result in a change in the total plant noise at the fence line. (MM 10-3b)

ROAD AND DRAINAGE CONSIDERATIONS

36. A. General Requirements:

1) Improvement plans prepared by a registered civil engineer shall be submitted to the Public Works Department, Engineering Services Division, along with review and inspection fees, and security for all public improvements required by the Ordinance Code for the conditions

of approval of this development. These plans shall include any necessary traffic signage and striping plans for review by the Transportation Engineering Division.

This development shall conform to the requirements of Division 914 (Drainage) of the County Ordinance Code. The following requirements must conform with Divison 914.

2) This development shall comply with the requirements of Title 9 and Title 10 of the County Ordinance Code. Any exceptions therefrom must be specifically listed in this conditional approval statement.

B. Roadway Improvements (Frontage):

1) The applicant shall construct curb and necessary pavement widening along the Arnold Industrial Way frontage and through the curb return at the Solano Way intersection. The face of curb shall be constructed 30 feet from the road centerline.

2) The applicant shall widen the existing pavement on Solano Way along the project frontage as necessary to attain a 32-foot pavement width, with additional width as necessary to provide left-turn lanes where needed, and on Waterfront Road along the project frontage as necessary to attain a 32-foot pavement width from the existing bridge to the Solano Way/Waterfront Road intersection.

If Solano Way is closed to public access in the future, the road improvements will not be required. Accordingly, the applicant may execute a Deferred Improvement Agreement (DIA) requiring the owner of the property to construct the subject pavement widening. If the Board of Supervisors determines that Solano Way will remain open, the DIA will be called up at that time. If Solano Way is closed, the applicant will be released from the DIA.

The pavement width may be reduced along those sections of Waterfront Road and Solano Way where widening to a 32-foot half-width is infeasible (i.e., where conflicts with existing facilities cannot be resolved). A sketch plan shall be submitted to the Public Works Department, Engineering Services Division, for review showing all public road improvements prior to starting work on the improvement plans. The sketch alignment plan shall be to scale and show proposed edge of pavement lines, lane striping details, lighting, cross-sections, and any conflicts which may render the proposed pavement widening infeasible. The sketch plan shall extend a minimum of 150-feet beyond the limits of the proposed work. The sketch alignment plan shall also include sufficient information to show that adequate sight distance has been provided.

C. Roadway Improvements (EIR Mitigation Measures):

1) Monitoring, Traffic Demand Management and Traffic Controls

a. When the construction work force has reached 100 workers, a monitoring program of the Arnold Industrial Way/State Route 4 Westbound Ramps intersection shall commence. Monitoring shall be performed by a transportation consulting firm under the direction of the County Department of Public Works. Monitoring shall be monthly until the peak work force has been attained, after which the monitoring program may reduce to a quarterly status. Monitoring reports shall be provided to the Department of Public Works. The purpose of the monitoring will be to ensure the intersection is operating safely and that excessive queues which could interfere with State Route 4 or construction parking lot operations do not occur. The monitoring should include morning and afternoon peak period traffic counts and observation.

b. Tosco shall implement Travel Demand Management (TDM) measures to discourage peak hour drive-alone travel. TDM measures shall include, but shall not be limited to, shuttle bus service for construction workers, subsidies for transit passes, provision of preferred parking for carpools and vanpools, and provision of on-site bicycle lock-up areas to encourage bicycling to the job site. If TDM measures do not mitigate the impact as identified in the monitoring reports, Tosco shall implement EIR Mitigation Measure 12-2c.

c. Should the monitoring reports indicate that excessive queues (15 or more vehicles on the off-ramp) or unsafe conditions are present, Tosco shall institute qualified manual traffic control of the intersection during the construction hours (6:00-7:00 a.m. and 5:00-6:00 p.m.).

(EIR Mitigation Measure 12-2)

2) Contribute this project's fair share toward pavement rehabilitation on the following roads:

Solano Way, north of Arnold Industrial Place,

Waterfront Road, between Solano Way and the Interstate 680 ramps,

Arnold Industrial Way, between Laura Alice Way and Solano Way, and

Arnold Industrial Place, between Peralta Road and Solano Way.

The fair share amount shall be based on the number of construction truck trips generated by the project versus the total number of truck trips along the subject road segments (estimated between 5% and 9% of the total cost of the pavement rehabilitation project).

(EIR Mitigation Measure 12-3(a))

3) Perform necessary structural pavement repair to damage caused by construction vehicles, subject to the review and approval of the Public Works Department. The County shall perform visual inspections of the structural condition of pavement along the Tosco frontage to determine if base failure and pothole repairs are necessary. If necessary, Tosco shall be responsible for the cost of any structural pavement repair along its frontage, based on the visual inspections, to restore the pavement to its pre-construction conditions.

(EIR Mitigation Measure 12-3(b))

4) Prepare a preliminary plan for the layout of the proposed parking lot for the review and approval of the Public Works Department. The plan shall show the internal circulation, location of entry/exit points, and the on-site location of the shuttle stop. The plan shall have sufficient information to show that adequate sight distance will be provided, and that truck turning movements can be accommodated.

(EIR Mitigation Measure 12-4)

D. Road Dedications:

1) With the exception of those portions which are in conflict with existing facilities, the applicant shall convey to the County, by Offer of Dedication, the right of way necessary for the planned future width of 68 feet along the frontage of Solano Way.

2) With the exception of those portions which are in conflict with existing facilities, the applicant shall convey to the County, by Offer of Dedication, the right of way necessary for the planned future width of 100 feet along the frontage of Waterfront Road.

E. Street Lights:

Application for annexation to CSA L-100 Lighting District shall be submitted prior to issuance of building permits.

F. Drainage Improvements:

1) Division 914 of the Ordinance Code requires that all storm waters entering or originating within the subject property shall be conveyed, without diversion and within an adequate storm drainage facility, to a natural watercourse having definable bed and banks, or to an existing adequate public storm drainage facility which conveys the storm waters to a natural watercourse.

2) The applicant shall install within a dedicated drainage easement any portion of the drainage system which conveys run-off from public streets.

OTHER REQUIREMENTS:

37. The applicant (including any agent thereof) shall defend, indemnify, and hold harmless the Contra Cosa County Planning Agency and its agents, officers, and employees from any claim, action, or proceeding against the Agency (the County) or its agents, officers, or employees to attack, set aside, void, or annul, the Agency's approval concerning this land use permit application. The County will promptly notify the applicant of any such claim, action, or proceeding and cooperate fully in the defense.

38. Tosco may not use the proposed Cardox Pond laydown area located in the northeast corner of Tract 6 for any construction equipment, supplies, or crew. The Zoning Administrator may approve alternate and additional locations for laydown areas within the delineated area of developed habitats or non-native grassland shown on Figure 7-1 of the project EIR. (MM 7-3)

39. Comply with the following archaeological resource requirements:

A. The applicant shall ensure that a qualified archaeologist is present on the site during any grading or excavation associated with the construction of Tank D, the Butane Isomerization Unit, the No. 3 HDS expansion, the No. 2 Hydrogen Plant expansion, and the No. 3 Reformer. The archaeologist shall monitor the activity to ensure that any archaeological resources which might be present are identified and appropriately managed as described in Condition #39.B./C./D.

B. If any significant cultural materials such as artifacts, human burials, or the like are encountered during construction operations, such operations shall cease within 100 feet of the find, the Community Development Department shall be notified within 24-hours and a qualified archaeologist contacted and retained for further recommendations. A qualified archaeologist is one who is certified by the Society of Professional Archaeology (SOPA). Significant cultural materials include, but are not limited to, aboriginal human remains, chipped stone, groundstone, shell and bone artifacts, concentrations of fire cracked rock, ash, charcoal, shell, bone, and historic features such as privies or building foundations.

C. In the event of discovery or recognition of any human remains on the site, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the corner of Contra Costa County has been contacted, per Section 7050.5 of the California Health and Safety Code.

D. Appropriate mitigation of the cultural resources may include monitoring of further construction and/or systematic excavation of the resources. Any artifacts or samples collected as part of the initial discovery, monitoring or mitigation phases shall be properly conserved, catalogued, analyzed, evaluated and curated along with associated documentation in a professional manner consistent with current archaeological standards.

40. Within six months of the effective date of the land use permit, the applicant shall submit to the Zoning Administrator for review and approval a Landscaping Plan prepared by a Certified Landscape Architect to add trees in the Clyde community to reduce the visibility of the refinery. The Landscaping Plan shall provide for:

A. The use of evergreen trees;

B. The planting of at least 350 trees;

C. A schedule for Plan implementation;

D. Ongoing maintenance designed to achieve a 90 to 95 percent success rate; and

E. The prompt replacement of vegetation that dies.

Prior to submittal to the County, the applicant shall submit the Plan to the Clyde Civic Improvement Association for their review and comment.

41. The applicant shall be allowed to located construction trailers on the refinery site during each of the Clean Fuels Project construction phases, and for an additional two months for each phase to allow for construction preparation and takedown.

42. The applicant shall provide the Clyde Civic Improvement Association, the Vine Hill Improvement Association, Pacheco Municipal Advisory Council and the facility Community Advisory Panel with quarterly newsletters informing the community of the project status and other relevant information.

43. The applicant shall advise neighboring community organizations (e.g. the Clyde Civic Improvement Association) of any employment opportunities that may develop during the project development.

44. The applicant shall work with the Contra Costa building trades to develop a hiring outreach program for existing apprentices from the Clyde, Pacheco, Martinez and Concord area.

45. The applicant shall, to the extent feasible, divert demolition debris and construction waste from the waste stream. Prior to the commencement of demolition or construction, the applicant shall meet with the Community Development Department Resource Recovery staff to identify opportunities for the diversion of materials.

46. Within 120 days of the effective date of this permit, the applicant shall submit an application for a general plan amendment or a rezoning to resolve the general plan and zoning inconsistency for the eastern portion of Tracts 1 and 7, and for the Cardox Pond area which is located on the border of Tracts 6 and 7.

47. Tosco shall coordinate scheduling with Southern Pacific to ensure that the additional rail car crossings at Waterfront Road and Solano Avenue. (MM 12-7)

    A. Take place outside the peak hours of vehicular traffic on these roadways (7:15-8:15 a.m. and 4:30-5:30 p.m.); or

    B. Are added to trains already using these crossings outside the peak hours.

ADVISORY NOTES

PLEASE NOTE ADVISORY NOTES ARE ATTACHED TO THE CONDITIONS OF APPROVAL BUT ARE NOT A PART OF THE CONDITIONS OF APPROVAL, ADVISORY NOTES ARE PROVIDED FOR THE PURPOSE OF INFORMING THE APPLICANT OF ADDITIONAL ORDINANCE REQUIREMENTS THAT MUST BE MET IN ORDER TO PROCEED WITH DEVELOPMENT.

A. The applicant will be required to comply with the requirements of the Building Inspection Department. Building permits may be required prior to the construction of structures.

B. This project may be subject to the requirements of the Department of Fish & Game. The applicant should notify the Department of Fish & Game, P.O. Box 47, Yountville, California 94599, of any proposed construction within the development that may affect and fish and wildlife resources, per the Fish and Game Code.

C. This project may be subject to the requirements of the United States Army Corps of Engineers. The applicant should notify the appropriate district of the Corps of Engineers to determine if a permit is required.

D. The applicant will be required to comply with the requirements of the Bridge/Thoroughfare Fee Ordinance for the Central County Area of Benefit as adopted by the Board of Supervisors.

E. The applicant will be required to comply with all rules, regulations and procedures of the National Pollutant Discharge Elimination System (NPDES) permit for municipal, construction and industrial activities as promulgated by the California State Water Resources Control Board or any of its Regional Water Quality Control Boards (San Francisco Bay-Regional II or Central Valley-Region V).

F. The Building Inspection Department will require building permits and compliance with Title 24 requirements for construction trailers which are larger than single wide, or which are occupied by clerical, project management or engineering personnel.

G. The applicant may be required to comply with the requirements of the Federal Aviation Administration prior to the commencement of construction of any of the structures.

H. The project lies within the 100-year flood boundary as designated on the Federal Emergency Flood Rate Maps. The applicant shall be aware of the requirements of the Federal Flood Insurance Program and the County Flood Plain Management Ordinance (Ordinance No. 90-18) as they pertain to future construction of any structures on this property.

CK/aa
LUPXXXXV/2033-93C.CK
11/10/94
11/21/94

APPENDIX D

EXAMPLES OF CEQA MITIGATION
FOR CARFG2 REFINERY MODIFICATIONS

Appendix D:

Examples of CEQA Mitigation For CaRFG2 Refinery Modifications

Chevron (Richmond):

Air Quality Related Mitigation Measures - Not required by the BAAQMD

- Proposed spheres shall be designed to include process valves that meet 100 ppm standard (i.e., the 1997 standard which other project valves would meet) and pressure relief valves in gas service that vent to the Refinery gas recovery system. This would reduce HC emissions from the Project by approximately 60 lbs/day.
- Bellows valves (rather than graphite-packed valves) on all gas and light liquid hydrocarbon streams for lines two inches or less... This measure would reduce HC emissions from the Project by 100 to 200 lbs/day.

Additional Conditions:

- Applicant shall attempt to obtain the cooperation of Shell and/or CBE in tracking Shell's remote sensor fenceline monitor pilot project. If after six months of success... Chevron shall install a similar remote sensor fenceline monitoring pilot system.
- Applicant shall inform the Community Advisory Panel on quarterly basis of progress with implementation.
- Applicant shall contribute $50,000 annually for six years (till future legislative improvements for the reduction of NO_x are in place) to the City's Urban Forest Program to compensate the community for project emissions.
- Applicant shall permanently shut down and surrender operating permits for any refinery facilities which were included in the EIR 1992 Inventory... (e.g., shut down of the No. 2 Dewax and asphalt manufacturing, loading operations would reduce HC emissions by approximately 550 lbs/day).
- Applicant shall retrofit tanks built prior to 1979 with low emission fittings. This measure would reduce HC emissions by approximately 25 lbs/day for each tank retrofit.
- Applicant shall reduce fugitive HC emissions from certain tanks, valves, pumps, and/or compressors to a level below that required by current regulations.
- Applicant shall limit FCC Unit Combustion HC emissions to their current level... This measure would reduce HC emissions from the Project by 250 lbs/day.

Unocal (currently Phillips-Rodeo):

Emission Related Mitigation Measures - Not required by the BAAQMD:

- Applicant shall implement the duct burner option for increased steam production to reduce project emissions of nitrogen oxides.

- If hydrogen plant heater and each of the steam turbines (after source tests) exceeds 27 tons per year then the applicant shall provide contemporaneous offsets, either on-site or off-site or accept a valve leak definition to 100 ppm for all valves at the Unocal Rodeo refinery subject to BAAQMD Regulation 8-18, effective March 1, 1996.

Other Conditions:

- Applicant shall provide the Rodeo community with quarterly newsletters informing them of project status...

- Applicant shall appear before the Rodeo MAC on a quarterly basis during the project construction period to provide information...
- Unocal shall deposit with the County Community Development Department $50,000 in January 1995 and $50,000 in January 1996 for community improvement projects in Rodeo.
- Unocal shall cooperate with Contra Costa County Health Services Department to develop a community advisory program.
- The applicant shall construct a bike trail and walking path along the Unocal property...
- Unocal shall contribute $25,000 per year for the next three years to the John Swett Unified School District for specific student programs.
- Unocal shall contribute $378,000 for a facilities improvement project at Hillcrest School. The project will replace windows, weather stripping and doors and will be administered by the school district.

APPENDIX E

EXAMPLES OF LETTERS – LOCAL GOVERNMENT AGENCIES
REQUESTING THE SCAQMD TO SERVE AS LEAD AGENCY
FOR THE CaRFG2 REFINERY PROJECTS UNDER CEQA

South Coast
AIR QUALITY MANAGEMENT DISTRICT
21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (714) 396-2000

June 11, 1992

Tom Markin
ARCO Products Company
P.O. Box 6210
1801 East Sepulveda Boulevard
Carson, California 90749

Dear Mr. Markin,

To further reduce motor vehicle emissions in California, the Air Resources Board (ARB) has adopted regulations to maximize emission reductions by establishing new, stringent vehicle exhaust emission and fuel quality standards. Phase 1 of the fuel quality standards requires gasoline to meet a set of specifications to reduce emissions from the existing vehicle fleet without requiring major process changes by refineries. Phase 2 requires more stringent specifications effective 1996. Refineries may have to modify existing equipment or install new equipment to comply with the Phase 2 regulations.

While the ARB regulations specify fuel quality standards, the ARB does not have permit authority over refineries. Modification of your current operations in order to comply with the ARB regulations may, however, require permits from other government agencies (e.g., local government, water districts, etc.). The South Coast Air Quality Management District (SCAQMD) will require permit applications for equipment modifications and/or additions necessary to comply with the ARB fuel quality standards.

As part of the SCAQMD permit process, California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.) analysis is conducted. The preparation of CEQA documents, their review by the public and local and state agencies, and their potential adoption by the lead agency can be a lengthy process. The SCAQMD would like to help you facilitate this process so that the cleaner gasoline can be brought to market as scheduled *or* as soon as possible. Consequently, as a means of expediting the CEQA review, SCAQMD suggests that you determine as soon as possible which permitting authority will be the lead agency for your refinery modification process. If no other permitting authority assumes lead agency responsibility, please submit a formal letter to Cindy S. Greenwald at the above address requesting the SCAQMD to act in this capacity.

If the SCAQMD is to act as lead agency for your project and an environmental impact report is required, SCAQMD requests that you select a consultant, subject to SCAQMD approval, to prepare the document. When acting as the lead agency, SCAQMD must exercise substantial review of a CEQA document as it is being prepared and prior to its public release [state CEQA Guidelines Section 15084(e)]. All requests for EIR consultant approval should be submitted in writing to Cindy S. Greenwald, Manager, Office of Planning and Technology Advancement.

If you have any questions or comments in regard to this matter, please contact Ms. Greenwald at 714-396-3117.

Sincerely,

Alan C. Lloyd, Ph.D.
Chief Scientist

c: Barry R. Wallerstein
Cindy S. Greenwald
Peter Greenwald
Steve Smith
Anupom Ganguli
Hubert Wilson

ACL:BRW:CSG:JDN

ENT BY:

Post-it™ brand fax transmittal memo 7671 | # of pages ▸ 1

To SCOTT MORTAUS	From ADELA EWERT
Co. MOBIL OIL CORP	Co. CITY OF TORRANCE
Dept.	Phone # (310) 618-5946
Fax # (310) 212-4281	Fax # (310) 618-5829

CITY
TORRA

PLANNING
DEPARTMENT

DAVID S. FERREN
PLANNING DIRECTOR

September 24, 1992

Ms. Cindy B. Greenwald, Planning Manager
Planning and Technology Advancement
South Coast Air Quality Management District
21865 E. Copley Drive
Diamond Bar, California 91765-4182

RE: Lead Agency Determination - Mobil Clean Fuels Project
Mobil Cogeneration Project

Dear Ms. Greenwald:

We have been asked by Mobil Oil Corporation for concurrence from the City of Torrance that the South Coast Air Quality Management District act as Lead Agency for the proposed clean fuels and cogeneration projects.

The City of Torrance would agree, in this case, to be a Responsible Agency and will review and comment as necessary on documents prepared by the South Coast Air Quality Management District.

We do, however, want to point out that this will not preclude the requirement for a Conditional Use Permit based on the as yet undetermined size and scope of the project. The Torrance Municipal Code in Section 95.3.30 Environmentally Significant Manufacturing, could require approval of a Conditional Use Permit for the project. A determination of whether or not a Conditional Use Permit or other discretionary permits will be required cannot be made until more specific plans and specifications are available for review.

If you need additional information please contact Jane Hasselbach or Jeff Gibson at (310) 618-5990.

Sincerely,

David S. Ferren
Planning Director

By Jeffery W. Gibson
Jeffery W. Gibson
Senior Principal Planner

cc: W. H. Buckalew

3031 Torrance Boulevard • Torrance, California 90509-2970 • Telephone 213/618-5990

CITY OF LOS ANGELES
CALIFORNIA

CITY PLANNING COMMISSION

WILLIAM G. LUDDY
PRESIDENT
THEODORE STEIN, JR
VICE-PRESIDENT
LYDIA H. KENNARD
SUZETTE NEIMAN
FERNANDO TORRES-GIL

RAMONA HARO
SECRETARY

(213) 485-5071

TOM BRADLEY
MAYOR

DEPARTMENT OF
CITY PLANNING
ROOM 561, CITY HALL
200 N. SPRING ST.
LOS ANGELES, CA 90012-4801

CON HOWE
DIRECTOR
FRANKLIN P. EBERHARD
DEPUTY DIRECTOR
(213) 237-1986
MELANIE S. FALLON
DEPUTY DIRECTOR
ROBERT H. SUTTON
DEPUTY DIRECTOR
(213) 237-1818
FAX (213) 237-0552

September 30, 1992

Cindy S. Greenwald, Planning Manager
Planning and Technology Assessment
South Coast Air Quality Management District (SCAQMD)
21865 E. Copley Drive
Diamond Bar, CA 91765-4182

SUBJECT: LEAD AGENCY RESPONSIBILITY FOR CLEAN FUELS PROJECT-
ULTRAMAR INC.

Ultramar Inc has inquired as to whether the City will be assuming lead agency status for the CEQA review of their Clean Fuels project. According to the Office of Zoning Administration and the Chief Hearing Examiner, and based on the information submitted by Ultramar, it appears that there are no major discretionary approvals necessary for the proposed refinery modifications.

Furthermore, the primary issues are related to air quality, and SCAQMD has more expertise in the issues associated with air quality and refinery process. SCAQMD will need to issue permits for the construction and modification of refinery units.

The City therefore agrees that SCAQMD is the more appropriate lead agency to assume the lead agency responsibility pursuant to CEQA Guidelines 15051.

Attached is a list of agencies and organization normally contacted as part of the Notice of Preparation consultation when the City Planning Department is the lead agency. We would appreciate inclusion of these agencies in the SCAQMD process.

If there are any questions, please contact Merryl Edelstein, Senior City Planner, at (213) 485-3508.

Sincerely,

CON HOWE
Director of Planning

Joel L. Sutton, for
Franklin P. Eberhard
Deputy Director for Project Planning

cc: Lillian Kawasaki, Richard Holguin, Robert Janovici, Susan Pfann, Bob Rogers, Jason Lee (Ultramar)

AN EQUAL EMPLOYMENT OPPORTUNITY – AFFIRMATIVE ACTION EMPLOYER

RCD 10-5-92 by Harold Holmes
cc: POV JZM
RAF TOF
DCS MPJ
J.C. HKQ
AMK

Ultramar

Ultramar Inc.
P.O. Box 93102
Long Beach, CA 90809-3102
(310) 437-6795

Telecopy 310-437-3227 Engineering
310-436-0350 Operations
310-436-9711 Warehouse

October 1, 1992

Via Federal Express

South Coast Air Quality Management District
21865 E. Copley Drive
Diamond Bar, CA 91765-4182

Attention: Ms. Cindy S. Greenwald, Planning Manager
Office of Planning and Technology Advancement

Dear Ms. Greenwald:

In response to your letter dated August 4, 1992, we have contacted the City of Los Angeles and the California Coastal Commission. These respective agencies have prepared and forwarded a letter to the South Coast Air Quality Management District (SCAQMD) regarding lead agency responsibility under California Environmental Quality Act (CEQA) for Ultramar's Clean Fuels Program projects. These letters relay each agency's basis as to why the SCAQMD is the appropriate lead agency for CEQA review. For your convenience, a copy of each letter is enclosed with this letter.

Based on our evaluation of these letters, Ultramar renews its request for the SCAQMD to act as lead agency.

Due to a strict time schedule of Federal and California Clean Fuels requirements, CEQA review must proceed with all due haste. Please notify us as soon as possible of the SCAQMD's decision and, hopefully, Ultramar's contact person at the SCAQMD in regard to lead agency authority.

If you would like to discuss this matter in more detail, please call me at (310) 491-6615.

Sincerely,

Ultramar Inc.

Jason R. Lee
Environmental, Safety, and PSM Manager
Clean Fuels Program

CC: R. Blanchfield, CCC
M. Edelstein, CLA
H. Holmes, CARB
S. Pfann, CLA
S. Smith, SCAQMD

ATE OF CALIFORNIA—THE RESOURCES AGENCY

PETE WILSON, Governor

ALIFORNIA COASTAL COMMISSION
FF' NT, SUITE 2000
N CISCO, CA 94105-2219
ICE AND TDD (415) 904-5200

August 21, 1992

Cindy S. Greenwald
Planning Manager
Planning and Technology Assessment
South Coast Air Quality Management District (SCAQMD)
21865 E. Copley Drive
Diamond Bar, CA 91765-4182

RECEIVED
AUG 24 1992
ENVIRONMENTAL DEPT.

Subject: Lead Agency Responsibility for Ultramar's "Clean Fuel Projects"

Dear Cindy:

We have received a copy of your letter (August 4, 1992) to Mr. Jason Lee, regarding lead agency responsibility for the Ultramar "clean fuel projects".

For this particular project, we believe The California Coastal Commission is not the appropriate agency to assume the lead agency role in the CEQA review process for the Ultramar "clean fuel projects". Coastal Act section 30253(3) requires that "[n]ew development hall ...[b]e consistent with requirements imposed by an *air pollution control district* or the State Air Resources Control Board as to each particular development" (emphasis added). Thus, SCAQMD permit requirements are first required before the Commission can make its findings for the issuance of the Coastal Development Permit.

In addition, this project is mandated by the Clean Air Act of 1990. The most significant issues for this particular project have more to do with air quality impacts than with land use or other coastal resource impacts.

We, therefore, believe SCAQMD is the most appropriate agency to assume the lead agency responsibility for this particular project, pursuant to California Code of Regulations, Title 14, Section 15051. With regard to the CEQA review process, the Coastal Commission's permit review process is certified pursuant to Public Resources Code 21080.5 (14 CCR section 15251(c)).

If you have any questions you may contact me at 415-904-5240.

Sincerely,

Susan Hansch
Manager, Energy and Ocean Resources Unit

cc: J. Lee
P. Venturini
R. Holquin

APPENDIX F

CITY OF RICHMOND LETTER TO BAAQMD (September 3, 1992)
REQUESTING BAAQMD SERVE AS COOPERATING AGENCY

AND

BAAQMD LETTER TO ARB (October 9, 1992)
ROLE OF BAAQMD AS COOPERATING AGENCY
FOR CaRFG2 REFINERY PROJECTS UNDER CEQA

9/10/92 CC: PDV RAF DCS JEA LMK
FYI
From: Harold Holmes

Office of
LAWRENCE M. MOORE
City Manager

City of Richmond

File: EID 92-xx

September 3, 1992

Mr. Milton Feldstein
Air Pollution Control Officer
Bay Area Air Quality Mgmt. District
939 Ellis Street
San Francisco, CA 94109

Dear Mr. Feldstein:

Chevron U.S.A. is proposing to undertake several projects at their Richmond Refinery to comply with 1995/1996 Federal and State clean air requirements. They have requested that the City of Richmond act as lead agency for these projects.

We understand that the Southern California regional air district has agreed to be the lead agency for the refinery projects within their region. It is clear that the primary issues will be related to air quality impacts, and that the air districts have the greatest expertise relative to these matters.

The City of Richmond is agreeable to being the lead agency for this project. However, given the aforementioned expertise of the Bay Area Air Quality Management District (BAAQMD), I believe that it is essential that the BAAQMD participates as a cooperating agency in accordance with Subsection (d) of Section 15051 of the State CEQA Guidelines.

The City of Richmond had a conceptually similar agreement with the Regional Water Quality Control Board (RWQCB) for Chevron's Deep Water Outfall Project. The agreement was formalized by their Board action. As a cooperating agency, the RWQCB participated in meetings relative to the project and/or environmental impact report, reviewed the work proposal from the consultant and all administrative draft documents, and was listed as a cooperating agency in the draft and final environmental impact reports (EIR). The City handled all administrative procedures (e.g., contracting with the consultant, preparing and mailing required notices, etc.).

2600 Barrett Ave. P.O. Box 4046 Richmond California 94804 telephone: 510 620-6512

The purpose of this letter is to request the participation of the BAAQMD as a cooperating agency during the EIR process for the Chevron Refinery projects. As a cooperating agency the BAAQMD would participate in the same above noted manner as did the RWQCB for the previous Chevron project. If this agreement is satisfactory to BAAQMD, please have both copies of this letter signed and return a copy to Jim Farah, Planning Director, 2600 Barrett Avenue, Richmond, CA 94804, or respond in writing as to whether or not this agreement is acceptable.

Sincerely,

Lawrence M. Moore
City Manager

LMM:nk

cc: Members of the BAAQMD Board
Larry L. Long, Chevron U.S.A. Inc.
Harold Holmes, CARB
Leonard Whorton, Assistant City Manager

BAAQMD agrees to be a cooperating agency with the City of Richmond on the Chevron Richmond Refinery Projects relating to the 1995/1996 Federal and State clean air requirements.

Signature: _____
Name: _____
Title: _____

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

ALAMEDA COUNTY
Edward R. Campbell
Loni Hancock
Greg Harper
Frank H. Ogawa

CONTRA COSTA COUNTY
Paul L. Cooper
Sunne Wright McPeak
Tom Powers

MARIN COUNTY
Al Aramburu

NAPA COUNTY
Paul Battisti
(Secretary)

SAN FRANCISCO COUNTY
Roberta Achtenberg
Harry G. Britt

SAN MATEO COUNTY
Anna Eshoo
(Chairperson)

SANTA CLARA COUNTY
Martha Clevenger
Rod Diridon
Joe Head
Dianne McKenna

SOLANO COUNTY
Osby Davis

SONOMA COUNTY
Jim Harberson
Patricia Hilligoss
(Vice-Chairperson)

October 9, 1992

Mr. James Boyd
Executive Officer
Air Resources Board
Executive Offices
P.O. Box 2815
Sacramento, CA 95812

Dear Jim:

I would like to take this opportunity to share with you the October 7, 1992 response by the APCO to the request of the Mayor of Richmond, California pertaining to the Chevron Clean Fules Project. I wish to assure you that the District staff will provide all of the assistance that this agency can deliver to the City of Richmond, the lead agency, in the preparation of the EIR.

We intend to cooperate with the City of Richmond in our role as a responsible agency in the preparation of the Clean Fuels Project EIR.

Should you have any questions regarding this matter, please do not hesitate to contact me.

Sincerely,

Peter Hess
Deputy Air Pollution Control Officer

PH:ca
Attachment

cc: Harold Holmes
Mike Kenny

939 ELLIS STREET • SAN FRANCISCO, CALIFORNIA 94109 • (415) 771-6000 • FAX (415) 928-8560

RECYCLED PAPER

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

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SOLANO COUNTY
Osby Davis

SONOMA COUNTY
Jim Harberson
Patricia Hilligoss
(Vice-Chairperson)

CLERK OF THE BOARDS:
Carol Bradley
(415) 749-4961

October 7, 1992

Hon. George L. Livingston
Mayor
City of Richmond
2600 Barrett Avenue
P.O. Box 4046
Richmond, CA 94804

RE: Chevron Clean Fuels Projects; CEQA

Dear Mayor Livingston:

Supervisor Eshoo, the Chair of the District's Board of Directors, has asked me to respond to your letter of October 1, 1992 regarding the District's role in the environmental review of Clean Fuels Projects at Chevron's Richmond Refinery.

I would like to assure you that the District remains willing to closely coordinate its permitting efforts on the Chevron Clean Fuels Projects with the CEQA review to be conducted by the City of Richmond. However, it would also like to clear up any misconceptions which your staff may have concerning the reasons why the District declined to be a "cooperating agency" in connection with this CEQA review.

I was surprised by your comment that "the District may issue its permits in advance of the City issuing a Draft EIR". My letter of September 14 to your City Manager, Mr. Moore, included no such language. To the contrary, what I did say was that in order to facilitate your CEQA responsibilities with respect to air quality issues, the District staff would "complete its air quality analysis...in advance of your scheduled date for issuing any Draft EIR...{which} will enable your consultant to include the District's analysis as part of the environmental documentation and will save you a duplication of effort on any air quality permit-related analysis." What I was trying to tell Mr. Moore with this language was that the District was willing to go out of its way to make the City's job easier in connection with the air quality issues to be addressed in your EIR, not that we would (or could) issue our permits in advance of the completion of your CEQA process. I hope that this explanation clarifies the matter to your satisfaction.

939 ELLIS STREET • SAN FRANCISCO, CALIFORNIA 94109 • (415) 771-6000
FAX (415) 928-8560

APPENDIX G

SCAQMD REFINERIES PROPOSED CARFG2 MODIFICATIONS
WITH BACT DETERMINATIONS

ARCO – CARSON
PROPOSED CARFG2 OPERATIONAL PHASE EMISSIONS SOURCES WITH BACT DETERMINATIONS

App. No.	Source Description	BACT
274405 &	No.1 Crude Distillation Unit	1) All pumps will be equipped w/ double mechanical seals w/ barrier fluid and are vented to a vapor recovery system. Leak of VOC is considered to be in excess of 500ppm.
274406	No.2 Crude Distillation Unit	2) Valves and flanges leak is in excess of 500ppm. 3) Pump shaft seals are enclosed and vented to a vapor recovery system or a vapor disposal system.

App. No.	Source Description	BACT
284271 &	Naptha Hydrodesulfurization Unit	1) Valves – Bellows sealed valves for sizes 2" and smaller. Valves 3" and larger will utilize API/ANSI design.
284275	Naptha HDS Unit	2) Pumps – Double mechanical seals or equivalent seals, specifically dry running tandem mechanical seals vented to a closed system for all new replacement process pumps in light service. 3) Flanges – Flanged connections will be designed in accordance with ANSI B16.5-1988 pipe flanges and flanged fittings. 4) Pressure relief valves – PRV's routed to a closed system. 5) Process drains – Drain lines will be provided with two normally closed block valves in series, or a single block valve in series w/ a cap or plug. Drain hubs (funnels) will be equipped w/ P-traps and/ or seal pots. 6) Combustion emission controls – SO_x & PM requirements will be met by firing natural gas w/ total sulfur content of less than 100ppm. Low NO_x burners have been selected for controlling NO_x emissions for heaters w/ a fired duty of less than 18 MMBtu/hr. 7) Compressors – Makeup H2 Booster compressor will be equipped w/ oil film or buffer gas as barrier fluid or equivalent seals.

App. No.	Source Description	BACT
284281	Light Gasoline Hydrogenation Unit	No BACT listing in application

App. No.	Source Description	BACT
284291	Hydrogen Production Heater	1) All pumps & compressors are equipped w/ seal venting to a closed vent system. 2) Bellow sealed valves will be employed on valves 2" and smaller, SCR w/ ammonia injections is employed for the control of NO_x emissions from the heater.

App. No.	Source Description	BACT
285601	Fluid Feed Hydrodesulfurization Unit	No BACT listing in application.

App. No.	Source Description	BACT
286485	C5 Alkylation Unit	1) Valves – Bellows sealed valves for sizes 2" and smaller. Valves 3" and larger will utilize API/ANSI design.
286494	Butane Tank Car Loading/ Unloading System	2) Pumps – Double mechanical seals or equivalent seals, specifically dry running tandem mechanical seals vented to a closed system for all new replacement process pumps in light service.
286495	Tank-681, Light Ends	3) Flanges – Flanged connections will be designed in accordance with ANSI B16.5-1988 pipe flanges and flanged fittings.
286496	Tank-682, Light Ends	4) Pressure relief valves – PRV's routed to a closed system.
286497	Tank-683, Light Ends	5) Process drains – Drain lines will be provided with two normally closed block valves in series, or a single block valve in series w/ a cap or plug. Drain hubs (funnels) will be equipped w/ P-traps and/ or seal pots.
286498	Tank-684, Light Ends	

App. No.	Source Description	BACT
286499	No.1 HDS Unit Naptha	1) Valves – Bellows sealed valves for sizes 2" and smaller. Valves 3" and larger will utilize API/ANSI design. 2) Flanges – Flanged connections will be designed in accordance with ANSI B16.5-1988 pipe flanges and flanged fittings. 3) Pressure relief valves – PRV's routed to a closed system. 4) Process drains – Drain lines will be provided with two normally closed block valves in series, or a single block valve in series w/ a cap or plug. Drain hubs (funnels) will be equipped w/ P-traps and/ or seal pots.

App. No.	Source Description	BACT
305323	Hydrogen Production No.2 Plant	1) Valves – Bellows sealed valves for sizes 2" and smaller. Valves 3" and larger will utilize API/ANSI design. 2) Flanges – Flanged connections will be designed in accordance with ANSI B16.5-1988 pipe flanges and flanged fittings.

App. No.	Source Description	BACT
305363	C5 Alkylation Pretreating System	1) Valves – Bellows sealed valves for sizes 2" and smaller. Valves 3" and larger will utilize API/ANSI design. 2) Flanges – Flanged connections will be designed in accordance with ANSI B16.5-1988 pipe flanges and flanged fittings.

App. No.	Source Description	BACT
305756	Naptha Isomerization Unit	1) Valves – Bellows sealed valves for sizes 2" and smaller. Valves 3" and larger will utilize API/ANSI design. 2) Flanges – Flanged connections will be designed in accordance with ANSI B16.5-1988 pipe flanges and flanged fittings.

App. No.	Source Description	BACT
305942	Hydrocracking Unit	1) Valves – Bellows sealed valves for sizes 2" and smaller. Valves 3" and larger will utilize API/ANSI design. 2) Flanges – Flanged connections will be designed in accordance with ANSI B16.5-1988 pipe flanges and flanged fittings.

App. No.	Source Description	BACT
323940	C4 Alkylation Unit	1) Valves – Bellows sealed valves for sizes 2" and smaller. Valves 3" and larger will utilize API/ANSI design. 2) Flanges – Flanged connections will be designed in accordance with ANSI B16.5-1988 pipe flanges and flanged fittings. 3) Pressure relief valves – PRV's routed to a closed system. 4) Process drains – Drain lines will be provided with two normally closed block valves in series, or a single block valve in series w/ a cap or plug. Drain hubs (funnels) will be equipped w/ P-traps and/ or seal pots.

App. No.	Source Description	BACT
331848	Emergency Flare System	No BACT listing in application.

CHEVRON – EL SEGUNDO
PROPOSED CARFG2 OPERATIONAL PHASE EMISSIONS SOURCES WITH BACT DETERMINATIONS

BACT

BACT is applied to all new emissions sources. The SCAQMD's Regulation XIII and RECLAIM Rule 2005 requires BACT on any new permit unit, and any modification to an existing permit unit that results in a net increase in emissions or relocation of existing units.

The equipment that would require BACT includes furnaces, pumps, flares, storage tanks, compressors, process valves, and pressure-relief devices with the potential to emit regulated air contaminants such as NOx, SOx, VOC< CO, and PM10.

	Application	BACT
Furnaces	NO_x	Low NOx burners in conjunction with Selective Catalytic Reduction, converting NOx to non-polluting agents.
	SO_x	Controlled by maintaining sulfur content in the fuel gas below 100 ppm.
	PM_{10}	Control measure is the use of refinery gas or natural gas.
Pumps	All pumps	BACT standards include use of seal-less pumps with dual seals with barrier fluids or with dry-running dual seals, vented to a closed system.
Compressors	All compressors	BACT for compressors is the use of a barrier-type device, such as an oil film or gas seal vented to a vapor recovery system, accompanied by proper inspection and maintenance.
Process valve	All process valves	BACT for controlling fugitive VOC emissions from valves is to be determined by cost analysis in the SCAQMD. Process valves two inches or less in diameter are to use bellows-sealed valves for BACT. For larger valves, an inspection and maintenance program in conjunction with a performance standard for leaks (500 ppm) is BACT.
Flanges	All flanges	BACT for controlling fugitive VOC emissions from flanges is a gasket rated at 150 percent of actual working pressure, at service temperature, and a SCAQMD approved inspection and maintenance program.
Pressure relief valves	All Pressure relief valves	Released VOC's are vented to a vapor recovery system and then to a flare system. The vented VOC is routed to flares and burned off, yielding SO_x, NO_x, nonpolluting carbon dioxide and water.

MOBIL – TORRANCE
PROPOSED CARFG2 OPERATIONAL PHASE EMISSIONS SOURCES WITH BACT DETERMINATIONS

App. No.	Source Description	BACT
280595	Jet Fuel Finishing System	BACT not required.
280596	Saturated Gas Plant Unit No.7	Requirements are currently being reviewed.
280597	Unsaturated Gas Plant Unit No. 8	Requirements are currently being reviewed.
280599	LPG Merox Unit (App. Cancelled)	Requirements are currently being reviewed.
280600	Naptha Pretreater Unit Unit No. 20	Requirements are currently being reviewed.
280604	Butane Processing Unit	Requirements are currently being reviewed.
280605	Hydrogen Plant No.2 Unit No. 24	Requirements are currently being reviewed.
265076	Storage Tank w/ External Floating Roof, Gasoline	Application cancelled 2/23/96
272170	Storage Tank w/ External Floating Roof, Gasoline	No BACT listing in application.
272172	Storage Tank w/ External Floating Roof, Gasoline	Application cancelled 2/13/96 No BACT listing in application.
274395	Storage Tank w/ External Floating Roof, MTBE	No BACT listing in application.
280594	Crude Distillation Unit Unit No. 1	Application cancelled 3/3/94
281301	FCC Feed Hydrotreater Unit 25	Requirements are being determined.
281302	Selective Catalytic Reduction Unit serving 30 F-2 boiler	SCR system is BACT for new steam boilers.
281303	Selective Catalytic Reduction Unit serving steam generator 30 F-1	SCR system is BACT for new steam boilers.

App. No.	Source Description	BACT
281304	Steam Boiler A-Train	Boilers – SCR is most stringent for boilers, coupled with low NO_x burners. Pumps (light liquid service pump) – install either sealless type or double mechanical or tandem seals with barrier fluid or dry running with closed vent system. Valves (2" or smaller") – install sealed bellows valves Valves (greater than 2") – live loaded with dual seal system or low emission (< or = 500ppm). Requirements shall apply to all valves in gas/vapor & light liquid services. Flanges – ANSI/ API standards Pressure Relief Valves – PRV's not coupled w/ rupture disc shall vent to a vapor recovery system.

App. No.	Source Description	BACT
281307	Fluid Catalytic Cracking Unit	Requirements are currently being reviewed.
281309	Hydrogen Production Plant Unit No. 4	Requirements are currently being reviewed.
288577	LPG Tank Car Loading Facility Unit No. 51/52	Requirements are currently being reviewed.
288829	Emergency Relief System Flares	No information available on this application.

TEXACO – WILMINGTON
PROPOSED CARFG2 OPERATIONAL PHASE EMISSIONS
SOURCES WITH BACT DETERMINATIONS

App. No.	Source Description	BACT
281001	Benzene Saturation Unit	Pumps – New light liquid pumps for RFG project will be either sealles, double mechanical or tandem mechanical type of seals. Valves – Texaco will install sealed bellows valves for all 2" or smaller valves. The requirement applies to all valves in gas/vapor and light liquid service except for those specified in permit conditions. Flanges – ANSI /API standard flanges will be used. Pressure Relief Valves – All new PRVs will be vented to vapor recovery system except for those specified in permit conditions.

App. No.	Source Description	BACT
281002	Catalytic Reforming Unit No. 2	Pumps – New light liquid pumps for RFG project will be either sealles, double mechanical or tandem mechanical type of seals. Valves – Texaco will install sealed bellows valves for all 2" or smaller valves. The requirement applies to all valves in gas/vapor and light liquid service except for those specified in permit conditions. Flanges – ANSI /API standard flanges will be used. Pressure Relief Valves – All new PRVs will be vented to vapor recovery system except for those specified in permit conditions.
281003	Catalytic Reforming Unit No. 3	

App. No.	Source Description	BACT
288693	Splitter Reboiler Heater HD-204	SCR is the most stringent BACT for the new heater. Since HD-204 is an existing heater, BACT is not required. Texaco will install low NOx burners on this heater to achieve a net reduction. Two fired heaters H-101 H-102 will be scheduled for shutdown.

App. No.	Source Description	BACT
288694	Storage Tank No. TK-0-6, Naptha	Fixed Roof storage tanks storing volatile materials will be connected to the vapor recovery system.

App. No.	Source Description	BACT
301661	Vapor Recovery System	No BACT listing in application.

App. No.	Source Description	BACT
301662	Storage Tank	Fixed Roof storage tanks storing volatile materials will be connected to the vapor recovery system.
301663	Storage Tank	Same
301664	Storage Tank	Same
301665	Storage Tank	Same
301666	Storage Tank	Same

UNOCAL – CARSON & WILMINGTON
PROPOSED CARFG2 OPERATIONAL PHASE EMISSIONS
SOURCES WITH BACT DETERMINATIONS

App. No.	Source Description	BACT
311333	East Flare	1) Surge tank emissions vented to flare w/ control efficiency of 95%
311334	West Flare	2) Flares utilized as control measures to meet BACT for surge tank.

App. No.	Source Description	BACT
281356	Hydrotreating Unit (HDS) FCC Feed Pretreater 120	1) New pumps equipped with single seal, double seals.

App. No.	Source Description	BACT
289725	HDS Unit 120 Heater	1) For refinery heater (rating > 18 through 86.2 MMBtu/hr) for NO_x control is low NO_x burner & selective non-catalytic reduction (SNCR). But with increased efficiency of low NO_x burner, presently, will not install SNCR. SCR is not cost effective will not install. 2) Sulfur compounds in fuel limited to less than 100ppm. Unocal will use natural gas containing total sulfur low as 5ppm. 3) For CO, ROG, & PM, installation of oxygen analyzer is required per condition 5 to measure excess oxygen in ensuring completeness of the combustion reaction.

App. No.	Source Description	BACT
310596 (326109) sub.	Hydrotreating Unit 59	New fugitive components will meet BACT. New pumps equipped w/ seals. New valves (2" & smaller) are bellows sealed.

App. No.	Source Description	BACT
298618 (326115) sub.	Catalytic Reforming Unit 80	New fugitive components will meet BACT. New pump is equipped w/ single mechanical seal for heavy liquid service. New valves (2" & smaller) are bellows sealed.

App. No.	Source Description	BACT
287971 (326116) sub.	Catalytic Reforming Unit 100	New fugitive components will meet BACT. New pumps are equipped w/ tandem seals for light liquid service. New valves (2" & smaller) are bellows sealed.

App. No.	Source Description	BACT
326117	Hydrogen Production Plant Unit 118	Application incomplete no BACT listing.

App. No.	Source Description	BACT
290738 (326118) sub.	Hydrogen Production Plant Unit 118 Heaters	1) BACT for refinery heater (rating > 86.2 MMBtu/hr) for NO_x control is low- NO_x burner & SCR. 2) Sulfur compounds in fuel gas limited to less than 100ppm. Unocal will use refinery gas that contains total sulfur less than 100ppm. 3) For CO, ROG, & PM: Install O_2 analyzer to ensure completeness of combustion reaction.
App. No.	Source Description	BACT
311655 (326121) sub.	Gas Oil Hydrocracker Unit 120	New Valves (2" & smaller) are not bellows sealed since they are instrumental valves.
App. No.	Source Description	BACT
310339	Gasoline Blending Unit	New pumps are equipped w/ BACT (sealless).
App. No.	Source Description	BACT
323067 (326128) sub.	Petroleum Middle Distillate Blending	New pump is equipped w/ BACT (tandem seal).
App. No.	Source Description	BACT
292245 (326130) sub.	Vapor Control System Carbon Adsorber	Carbon adsorber has 98% control efficiency.
App. No.	Source Description	BACT
326164	South Flare	No BACT listing (note: large emission benefit cited for this application).
App. No.	Source Description	BACT
317755 (326166) sub.	Isomerization Unit 60	1) New pumps equipped w/ BACT (single seal type). 2) New valves (2" & smaller) are bellows sealed.
App. No.	Source Description	BACT
327229	Hydrotreating Unit 90	1) New fugitive components will meet BACT. New pumps are equipped w/ tandem seals. 2) New valves (2" & smaller) are bellows sealed.
App. No.	Source Description	BACT
295332 (326343) sub.	Storage Tank No. 2 Light Catalytically Cracked Gasoline	The tank will be equipped w/ double seals.
App. No.	Source Description	BACT
295334 (326345) sub.	Storage Tank No. 3 Naptha	The tank will be equipped w/ double seals.
App. No.	Source Description	BACT
299240 (327360) sub.	Hydrotreating Unit 89	New fugitive components will meet BACT. New pumps are equipped w/ mechanical seals for light liquid service. New valves (2"& smaller) will be bellows sealed.

App. No.	Source Description	BACT
334038	Butamer Unit 60	1) Pumps – Tandem sealed type pumps will be used for Perc and VOC services. 2) Valves – Bellow seals valves will be used for all 2" valves or smaller. The rest of the new valves will be live-loaded or low emission valves. 3) Flanges – BACT is using ANSI/ ASTM standards and I & M program.

App. No.	Source Description	BACT
334429	North Flare	All fugitive components associated with piping of this flare will be equipped w/ BACT. Application does not list what BACT is, however. Previous app. 294014 states that new pump is sealless BACT.

App. No.	Source Description	BACT
337587	Storage Tank 466 Fixed roof	Emissions from the low pressure tank is controlled by a vapor recovery system.

App. No.	Source Description	BACT
338490	Tail Gas Incinerator	Application incomplete. No BACT listing.

ULTRAMAR – CARSON & WILMINGTON
PROPOSED CARFG2 OPERATIONAL PHASE EMISSIONS
SOURCES WITH BACT DETERMINATIONS

App. No.	Source Description	BACT
277667	Hot Oil Heaters	1) Sulfur content of gaseous fuel 100ppm 2) NO_x emissions – SCR 3) SO_x emissions – 100 ppm total sulfur fuel gas

App. No.	Source Description	BACT
309044 (277668) prev.	Storage Tank w/ Ext. Floating Roof	External floating roof & seals for control system.

App. No.	Source Description	BACT
277670	Storage Tank, Naptha	Fixed roof w/ vapor recovery system w/ overall system efficiency of 95% or greater, employing carbon adsorption or refrigerated condenser.

App. No.	Source Description	BACT
309043 (277672)	Storage Tank	Tank is equipped with dual seals in accordance w/ District BACT guidelines.

App. No.	Source Description	BACT
281825	Storage Tank 33-V-1 Aqueous Ammonia	No BACT listing in this application.

App. No.	Source Description	BACT
281826	SCR Unit	Is the controlling unit for BACT.

App. No.	Source Description	BACT
281828 281829 281830	Storage Tank 82-TK-3 Storage Tank 82-TK-1 Storage Tank 82-TK-2	No BACT listing in these applications.

App. No.	Source Description	BACT
282620	Naptha Hydrotreater Charge Heater 56-H-1	1) NO_x emissions – SCR 2) SO_x emissions – 100ppm total sulfur fuel gas.

App. No.	Source Description	BACT
271654	Storage Tank 82-T-91	Floating roof & seals for control system.

App. No.	Source Description	BACT
291899 291900	Heater, Gas Oil Hydrotreater SCR	1) All pumps & compressors are equipped w/ seal venting to closed vent system. 2) Bellows sealed valves for valves 2" or smaller. 3) SCR w/ ammonia injection for control of NO_x.

App. No.	Source Description	BACT
291944	Amine Treating Unit	1) All pumps & compressors are equipped w/ seal venting to closed vent system. 2) Bellows sealed valves for valves 2" or smaller. 3) SCR w/ ammonia injection for control of NO_x.

App. No.	Source Description	BACT
257793	Amine Treating Unit	1) Bellows sealed valves. 2) Tandem mechanical seals on the amine pump. 3) Sealless gas scrubber pumps.
App. No.	Source Description	BACT
296076	Amine Regeneration Unit	1) Pumps & compressors equipped w/ seal venting to closed vent system. 2) Bellows sealed valves on valves 2" & smaller. 3) SCR w/ ammonia injection for control of NO_x emissions.
App. No.	Source Description	BACT
256041	Amine Treating Unit No. 45	Bellows sealed valves & sealless pumps.
App. No.	Source Description	BACT
301268 270955 309049	Gas Oil Unibon Hydrotreating Unit No. 80 Benzene Reduction Unit No. 51 Flare Gas Treating Unit 97	1) Use bellows sealed valves for ROG emissions of valves 2" or less. 2) Compressor seal is vented to vapor recovery system.
App. No.	Source Description	BACT
306175	Storage Tank w/ Fixed Roof	ROG vapor vented from this storage tank to an air pollution control system.
App. No.	Source Description	BACT
306177	Boiler	Use treated fuel gas for PM10 emissions.
App. No.	Source Description	BACT
306179	SCR	For NH_3 emissions by limiting stack concentration to less than 20 ppmv @ 3% O_2 dry basis.
App. No.	Source Description	BACT
307086	Fluid Catalytic Cracking Unit	1) Use bellows sealed valves for ROG emissions of valves 2" or less. 2) Compressor seal is vented to vapor recovery system.
App. No.	Source Description	BACT
307083	Alkylation Unit 68	1) Use bellows sealed valves for valves 2" or less.
App. No.	Source Description	BACT
308206	Isomerization Unit	1) Use bellows sealed valves for ROG emissions of valves 2" or less. 2) Compressor seal is vented to vapor recovery system.
App. No.	Source Description	BACT
307081	Tail Gas Unit 38	1) Use bellows sealed valves for valves 2" or less.
App. No.	Source Description	BACT
309050	MTBE/TAME Production Unit 67	1) Use bellows sealed valves for ROG emissions of valves 2" or less. 2) Compressor seal is vented to vapor recovery system.

APPENDIX H

BAAQMD REFINERIES PROPOSED CARFG2 MODIFICATIONS
WITH BACT DETERMINATIONS

CHEVRON'S PROPOSED CARFG2 OPERATIONAL PHASE EMISSIONS SOURCES WITH BACT DETERMINATIONS

New Sources

S-4355 DIB/ Butamer Plant
S-4356 Tertiary Amyl Methly Ether (TAME) Plant
S-3205 Tank, Methanol
S-3206 Tank, Whole Alkylate
S-3207 Tank, FCC Heavy GAsoline
S-3208 Sphere, Butane
S-3209 Sphere, Propane
S-3210 Sphere, Isopropane

Modified Sources

S-4291 Alkylation Plant
S-4357 C4 Treating Plant
S-6053 Alky/TAME Cooling Water Tower Bay
S-6016 FCC Flare
S-6019 Alky/Poly Flare
S-4285 Fluid Catalytic Cracker Unit (FCCU)
S-4353 #3 Naptha Hydrotreater
S-4032 #3 Naptha Hydrotreater, F101
S-4033 #3 Naptha Hydrotreater, F102
S-4346 Gas Recovery Unit
S-4348 H_2 Recovery Plant
S-4282 Aromatics Saturation Plant

Best Available Control Technology (BACT) – Regulation 2-2-301 states that BACT must be applied to sources emitting POC, NPOC, NOx, SOx, TSP, PM10, or CO in excess of 5 pounds per highest day or 365 pounds per year. The following are the units triggering this Regulation and their methods of compliance with BACT unless otherwise noted.

Flanges

Application	Condition	BACT
All flanges	All new flanges inspected quarterly. Leaks of POC defined as 100ppmv.	Use graphite-based gaskets or equivalents for this level of POC control.

Valves

Application	Condition	BACT
All valves	Valves inspected quarterly. Leaks of POC defined as greater than 100ppmv.	Use bellows valves, lived loaded valves, graphitic packing, or equivalent. All other valves will utilize upgraded packing for this level of POC control.

Pumps

Application	Condition	BACT
All pumps	Pumps inspected quarterly. Leaks of POC defined as greater than 500ppmv.	Use double mechanical seals and barrier fluid or equivalent. Will use double mechanical seals with heavy liquid barrier fluid and/or Chevron's seal vapor recovery system at all light liquid service pumps for this level of POC control.

Compressors

Application	Condition	BACT
All compressors	Compressors inspected quarterly. Leaks of POC defined as greater than 500ppm.	Use double mechanical seals and barrier fluid or equivalent. Use wet enclosed seals and/or Chevron's seal vapor recovery system for this level of POC control.

Relief Valves

Application	Condition	BACT
All relief valves	All pressure relief valves will be vented to a flare gas recovery system, furnace, or flare for POC control.	

Process Drains

Application	Condition	BACT
All process drains	Use p-trap or equivalent method. All new process units will have new process drains with p-traps installed for POC control.	

Alkylation Plant

Only new emission from this source is fugitive POC. Will comply with all BACT conditions as stated in tables above with exception of sulfuric acid services.
Sulfuric acid degrades graphitic packing and gaskets, therefore, use Teflon gaskets for flanges and Teflon/graphitic based packing for valves.

Deisobutanizer/ Butamer Plant

Only new emission from this source is fugitive POC. Will comply with all BACT conditions as stated in tables above.

C4 Treating Plant

Only new emission from this source is fugitive POC. Will comply with all BACT conditions as stated in tables above.

TAME Plant

Only new emission from this source is fugitive POC. Will comply with all BACT conditions as stated in tables above.

Hydrogen Recovery Plant

Only new emission from this source is fugitive POC. Will comply with all BACT conditions as stated in tables above.

Aromatics Saturation Unit

Only new emission from this source is fugitive POC. Will comply with all BACT conditions as stated in tables above. Valves which are 2 inches or less and are on process streams with greater than 2 wt% benzene shall wherever feasible (but no less than 95% of these valves) be Bellows-sealed valves or District approved technology. Fugitive sources with greater than 10 wt% benzene shall be inspected monthly.

Alkylation/ TAME Cooling Water Tower Bay

For particulate control, will equip S-6053 Cooling Tower with a high efficiency drift eliminator to reduce drift loss. BACT for POC emissions from this source consists of good operating practice and minimizing POC leaks from process equipment into the cooling water system.

Flare

BACT is not triggered because incremental increase in emissions from S-6016 and S-6019 are less than 1 pound per day.

Storage Tanks

All non-LPG tanks equipped with external floating roof tanks. Design criteria will meet but not be limited to dual seals with zero gap secondary seal. All roof penetrations are gasketed, adjustable roof legs fitted with vapor seal boots, and with no slots above liquid level on guide poles. Guide poles with organic liquid inside will have a float fitted with wiper seals.

FCCU Gasoline Hydrotreater

Only new emission from this source is fugitive POC. Will comply with all BACT conditions as stated in tables above.

FCC Unit

Application	Condition	BACT
POC	Will comply with all BACT conditions as stated in tables above for POC control. Compliance shall be based on annual source tests that demonstrate Chevron will not exceed 6.1 tons POC emissions per year.	
NOx	24hr operating day avg: 220ppmv NOx, 3% O_2, dry Rolling 30 day avg: 180ppmv NOx, 3% O_2, dry Calendar year avg: 150ppmv NOx, 3% O_2, dry	
SOx	24 hr day avg: 330ppmv SO_2, 3% O_2, dry	
CO	Rolling 30 day avg: 67ppmv CO, 3% O_2, dry Calendar year avg: 50ppmv CO, 3% O_2, dry	
PM10	Compliance shall be based on source tests that demonstrate Chevron will not exceed 21 lb/hr average of 4 source tests per calendar year.	

SHELL'S PROPOSED CARFG2 OPERATIONAL PHASE EMISSIONS SOURCES WITH BACT DETERMINATIONS

UNIT DESCRIPTION

A-4002 Delayed Coking Unit SCR
A-4005 Delayed Coking Unit Coke Barn Particulate Fabric Filter
A-4006 Delayed Coking Unit Railcar Loading Particulate Fabric Filter
A-4161 Hydrogen Plant – 3 SCR
A-4180 Sulfur Recovery Unit #4 SCOT Unit
A-4181 Sulfur Recovery Unit #4 Tailgas Thermal Oxidizer
A-4190 Boiler 6 Selective Catalytic Reduction
A-4191 Boiler 6 Catalytic Oxidation
A-4192 Boiler 6 Selective Catalytic Reduction
A-4193 Boiler 6 Catalytic Oxidation
A-4201 Flare Gas Recovery System
S-4001 Delayed Coker Unit
S-4002 Delayed Coker Unit – Furnace No. 1
S-4003 Delayed Coker Unit – Furnace No. 2
S-4004 Delayed Coker Unit – Furnace No. 3
S-4005 Delayed Coker Unit – Coke Handling
S-4010 Coker Gasoline Splitter Column
S-4020 Distillate Hydrotreater
S-4021 DHT Recycle Gas Heater
S-4022 DHT Fractionator Reboiler Heater
S-4023 DHT Heater SCR
S-4030 Cracked Gasoline Bottoming Column
S-4031 Cracked Gasoline Bottoming Column Reboiler Heater
S-4040 Distillate Saturation Unit – 2
S-4041 Distillate Saturation Unit – 2 Feed Heater
S-4042 Distillate Saturation Unit – 2 Reboiler Heater

UNIT DESCRIPTION

S-4050 Light Cracked Gasoline Treater
S-4080 C5/C6 Isomerization Unit
S-4090 Alkylation Unit
S-4100 Light Cracked Gaosline Hydrotreater
S-4101 LGHT Feed Heater
S-4130 Catalytic Reformate Bottoming Column
S-4140 Heavy Cracked Gasoline Hydrotreater
S-4141 HGHT Feed Heater
S-4150 Butane Isomerization Unit
S-4160 Hydrogen Plant – 3
S-4161 Hydrogen Plant – 3 SMR Furnace
S-4170 Lube Hydrotreater – 2
S-4171 Lube Hydrotreater (LHT-2)Feed Heater
S-4180 Sulfur Recovery Unit #4
S-4182 Sour Water Stripper
S-4183 Sour Water Stripper
S-4190 Boiler 6 Gas Turbine #1
S-4191 Boiler 6 Supplmt Steam Generator #1
S-4192 Boiler 6 Gas Turbine #2
S-4193 Boiler 6 Supplemental Steam Generator #2
S-4201 Flare
S-4210 Cooling Tower
S-4211 Maintenance Drop Out Vessel
S-4212 Maintenance Drop Out Vessel
S-4338 Pentane Loading Facility
S-4347 Sulfur Pit
S-4350 Process Wastewater Tank
S-4356 Process Wastewater Tank

NEW TANKS

S-4301 Spent Sulfuric Acid Tank; abated by A-33, Flare Gas Recovery System
S-4307 MDEA Make-up Tank
S-4308 DEA Tank #2
S-4309 DEA Tank #1
S-4310 Sour Water Tank
S-4311 Perchloroethylene Tank (pressurized)
S-4312 Perchloroethylene Tank (pressurized)
S-4319 Recovered Oil Tank; abated by A-56, Vapor Recovery
S-4321 DCU Feed Tank
S-4325 Isom Feed Tank
S-4329 Pentane Tank (pressurized); abated by A-4330, Pentane Vapor Recompression
S-4330 Pentane Tank (pressurized); abated by A-4330, Pentane Vapor Recompression
S-4333 Dimate Tank
S-4334 Alkylate Tank; by A-25, Vapor Recover
S-4335 Crude Oil Tank #1
S-4336 Crude Oil Tank #2
S-4346 Sulfuric Acid Tank
S-4349 Pentane Tank (pressurized); abated by A-4330, Pentane Vapor Recompression
S-4351 Process Wastewater Tank; abated by A-56, Vapor Recovery
S-4350 Olefin Storage (pressurized)
S-4354 Crude Oil Tank #3
S-4355 Crude Oil Tank #4
S-4356 Process Wastewater Tank; abated by A-56, Vapor Recovery

EXISTING TANKS

S-1129 Gaso Interim Tank (Tank 1129)
S-1130 Gaso Interim Tank (Tank 1130)
S-1131 Gaso Interim Tank (Tank 1131)

The following is a breakdown of BACT determinations:

Furnaces

Application	Condition	BACT
All furnaces with a design firing rate greater than or equal to 50 MMBTU/hr	10ppmv corrected to 3% O_2, avg. over 3 hrs	Use combination of low NOx burners & selective catalytic reduction (SCR) for this level of NOx control.
All natural draft furnaces with a design firing rate less than 50 MMBTU/hr	25ppmv corrected to 3% O_2, avg. over 3 hrs	Use low NOx burners for this level of NOx control.
All forced draft furnaces with a design firing rate less than 50 MMBTU/hr	20ppmv corrected to 3% O_2, avg. over 3 hrs	Use combination of low NOx burners and/or flue gas recirculation for this level of NOx control.
All furnaces, except hydrogen plant furnace (S-4161)	Combustion of refinery fuel gas or other gaseous fuel that does not exceed 50ppmv H_2S, avg. over 24 hrs	Use fuel gas amine treating system for this level of SO_2 control.
All furnaces, except S-4161	50ppm at 3% O_2, averaged over 8 hrs	Use an air to fuel ratio controller on each furnace for this level of CO control.
Hydrogen plant furnace S-4161	Combustion of refinery fuel gas and pressure swing absorber (PSA) gas. Refinery fuel gas will not exceed 50ppmv H_2S, avg. over 24 hrs. Total reduced sulfur in the refinery fuel gas will not exceed 100ppm, annual avg. The PSA gas will not exceed 3.6ppm H_2S avg. over 24 hrs. For SO_2 control.	
Hydrogen plant furnace S-4161	Due to its large firing rate, limit of 25ppm at 3% O_2, averaged over 8hrs	

Gas Turbines & Cogeneration plant

Application	Condition	BACT
Cogeneration Plant	5ppmv corrected to 15% , avg. over 3 hrs	Use steam injection & SCR for this level of NOx control.
Gas Turbines	Combustion of refinery fuel gas that does not exceed 50ppmv H_2S, avg. over 24 hrs	Use fuel gas amine treating system for this level of SO_2 control.
Gas Turbines	Limit of 6.5ppm at 15% O_2, avg over 8hrs or 90% overall reduction on a mass basis	Use non-selective catalytic oxidizer for this level of CO control.
Gas Turbine	Precursor Organic Compounds (POC) emissions	Use non-selective catalytic oxidizer for POC control.

Flares

Application	Condition	BACT
Flare	Steam assisted ground level flare with staged combustion. Pilots will be fueled with natural gas or LPG. The flare will be operated only during period of emergency upset or breakdown. Routine venting of process gases will go to the flare gas recovery system. For SO_2, CO, and PM control.	
Flare	Steam assisted ground level flare with staged combustion. The hydrocarbon destruction efficiency will be at least 98.5% on a mass basis. Pilots will be fueled with natural gas or equivalent. The flare will be operated only during period of emergency upset or breakdown. Routine venting of process gases will go to the flare gas recovery system. For POC control.	

Sulfur Recovery System

Application	Condition	BACT
Sulfur Recovery System #4 (SRU)	Exhaust from feed to tailgas incinerator will be limited to contain no more than 100ppm total reduced sulfur at 0% O_2. SO_2 and H_2S emissions from the tailgas oxidizer will not exceed 50 and 2.5ppm at 0% O_2. The sulfur pit will be enclosed and vented to the tailgas oxidizer. Sour H_2O strippers will remove 95% wt of the H_2S and NH_3 from the sour H_2O stream. The SRU and SCOT will achieve at least a 99.9% wt conversion of to elemental H_2S sulfur.	Use SCOT (Shell Claus Offgas Treatment) unit and a tailgas thermal oxidizer for this level of SO_2 control.
SRU #4	CO limit of 100ppm in the exhaust from the Thermal Oxidizer.	Meet limit by using good combustion practices.

Pumps

Application	Condition	BACT
Pumps in light liquid hydrocarbon service	Pumps inspected quarterly. Leaks of POC defined as greater than 500ppm.	Use double mechanical seals with a barrier fluid. The barrier fluid shall be either: 1) vented to a control device with a 95% efficiency; or 2) at a higher pressure than the process stream pressure.

Compressors

Application	Condition	BACT
Compressors in hydrocarbon service	Pumps inspected quarterly. Leaks of POC defined as greater than 500ppm.	Use double mechanical seals with a barrier fluid. The barrier fluid shall be either: 1) vented to a control device with a 95% efficiency; or 2) at a higher pressure than the process stream pressure.

Valves

Application	Condition	BACT
Valves in gaseous, light liquid, or toxic services	Valves inspected quarterly. Leaks of POC defined as greater than 100ppm.	Valves will be bellows sealed, lived loaded, graphitic packed, Teflon packed, or equivalent. Control valves will be live loaded with graphite packing and polished stems.

Flanges

Application	Condition	BACT
All flanges	Equipped with graphitic or Teflon gaskets, or equivalent for POC control.	

Pressure Relief Valves

Application	Condition	BACT
All pressure relief valves in hydrocarbon service	All pressure relief valves will be vented to the flare gas recovery system for POC control.	

Tanks

Application	Condition	BACT
Pressurized Tanks (6)	Vapor recompression or operate under a minimum pressure of 15 psig for POC control.	
New Storage Tanks (4)	Use existing vapor recovery systems for POC control.	
Remaining Tanks	Use external floating roof tanks. External floating roof tanks will have zero-gap secondary seals and with the exception of adjustable roof legs, the lowest emitting roof fittings, including: no ungasketted roof penetrations, and no slotted guide poles. Adjustable roof legs will be controlled by vapor seal boots. For POC control.	

Wastewater

Application	Condition	BACT
Maintenance Drop Out vessels	Enclosure and venting to the flare gas recovery system for POC control.	

Cooling Tower

Application	Condition	BACT
Cooling Tower	Installation of a hydrocarbon monitor to enhance the detection of hydrocarbon leaks to the cooling water system for POC control.	

Railcar Loading (Pentane)

Application	Condition	BACT
Pentane railcar loading operation	Use existing LPG flare (S-1470) for POC control.	

Coke Handling

Application	Condition	BACT
Coke handling operations	1) Coke moisture content of at least 8% wt; 2) water supression at the crusher and coke barn piles; 3) an enclosed conveying system; 4) an enclosed coke barn controlled by a particulate filter; 5) a shrouded railcar loading operation controlled by a particulate filter; and 6) a vehicle wash-off area inside of the coke barn.	

PACIFIC'S PROPOSED CARFG2 OPERATIONAL PHASE EMISSIONS SOURCES WITH BACT DETERMINATIONS

Unit	Description
A-109	Catalytic Converter abating S-270
A-110	SCR system abating S-271
A-111	Catalytic Converter abating S-271
A-112	SCR system abating S-272
A-113	Catalytic Converter abating S-272
A-252	SCR system abating S-252 & S-253
A-255	SCR system abating S-255
A-258	SCR system abating S-258 & S-259
A-268	SCR system abating S-268
A-270	SCR system abating S-270
A-275	SCR system abating S-275
A-276	Offgas Scrubber
A-278	SCR system abating S-278
A-279	SCR system abating S-279
A-281	North Vapor Recovery System abating S-281 & S-282
A-283	South Vapor Recovery System abating S-283, S-285, S-286, S-287, & S-288
A-368	Electrostatic Precipitator abating S-268
A-378	Oxidizing Catalysts abating S-278
A-379	Catalytic Converter abating S-279
A-468	Wet Gas Scrubber abating S-268
S-250	Crude / Vacuum Unit
S-252	Unifiner Heater 2-H-102
S-253	Unifiner Reboiler 2-H-102
S-254	Fluid Catalytic Cracking Unit
S-255	Feed Heater 3-H-201
S-256	Alkylation Unit

Unit	Description
S-257	Diesel Hydrotreater
S-258	Feed Heater 7-H-101
S-259	Feed Heater 7-S-102
S-266	FCCU Product Treating
S-268	CO Boiler 14-B-101
S-269	Hydrogen Plant
S-270	Reformer Furnace 16-H-101A/B
S-271	Reformer Furnace 16-H-201A/B
S-272	Reformer Furnace 16-H-301A/B
S-273	Isomerization Unit
S-274	Gas Oil Hydrotreater
S-275	Feed Heater 19-H-101
S-276	Sulfuric Acid Regeneration Plant
S-277	Sulfuric Acid Combustor Furnace
S-278	Gas Turbine 79-T-101
S-279	Gas Turbine 79-T-102
S-281	Crude Storage Tank 80-TK-101A
S-282	Crude Storage Tank 80-TK-101B
S-283	Naptha Storage Tank 80-TK-102
S-285	FCCU Feed Tank 82-TK-101A
S-286	FCCU Feed Tank 82-TK-101B
S-287	Diesel Hydrotreater Feed Tank 82-TK-102A
S-288	Diesel Hydrotreater Feed Tank 82-TK-102B
S-296	Cooling Tower
S-79	Unifiner/ Platformer

Crude/ Vacuum Unit (S-250)

Application	Condition	BACT
All Flanges	All new flanges inspected monthly. Leaks of POC defined as 100ppmv.	Use flanges with graphite-based gaskets or equivalent.
Valves (general)	Valves inspected monthly. Leaks defined as greater than 100ppmv.	Use bellows valves, live-loaded valves, graphite-based packing, or equivalent.
New valves in light liquid & gas service 2" and <	Valves inspected monthly. Leaks defined as greater than 100ppmv.	Use bellows valves.
All other valves	Valves inspected monthly. Leaks defined as greater than 100ppmv.	Use upgraded packing for all other valves.
Pumps	Pumps inspected monthly. Leaks defined as 100ppmv or greater.	Use double mechanical seals with heavy liquid barrier fluid, or canned or mag drive pumps.
Compressors	Compressors inspected monthly. Leaks defined as 100mmpv.	Use double mechanical seals and barrier fluid or equivalent.
Relief Valves	Recovery system, furnace or flare must have recovery/destruction efficiency of at least 98%.	Use rupture disks and vent to a fuel gas recovery system, furnace or flare.

Process drains	BACT must achieve approximately 80% control.	Use of p-trap or equivalent method.
Sample connections	N/A	Consists of closed loop sampling systems with an inert purge gas and venting to a control device. Septum sealed jars used for sampling.

Naptha Hydrotreater (S-252 & S-253; heater rated capacity of 24.55 & 23.25 MMBtu/hr)

Application	Condition	BACT
NO_x	Emissions limit of 10ppm NO_x corrected to 3% O_2, dry.	Use low NO_x burners and SCR (A-252) on S-252 & S-253. Will abate approx. 90% of NO_x.
POC	BACT is not determined	Good combustion practices and efficient operation for POC control.
SO_2	Gas used will not have H_2S level greater than 50ppm.	Use natural gas or treated refinery gas fuel for this level of SO_2 control.
PM	BACT 1 is not determined. BACT 2 is triggered.	BACT 2 specifies the use of natural gas or treated refinery fuel gas for PM control.

Isomerization Unit (S-273)

Application	Condition	BACT
POC	Unit emits only fugitive POC.	BACT for control of fugitive POC emissions same as for Crude Unit (S-250) above.

Diesel Hydrotreater (S-257)

Application	Condition	BACT
POC	Unit emits only fugitive POC.	BACT for control of fugitive POC emissions same as for Crude Unit (S-250) above.

Diesel Hydrotreater (S-258 & S-259; heater rated capacity of 28.57 & 32.47 MMBtu/hr)

Application	Condition	BACT
NO_x	Emissions limit of 10ppm NO_x corrected to 3% O_2, dry.	Use low NO_x burners and SCR (A-258) on S-258 & S-259. Will abate approx. 90% of NO_x.
POC	BACT is not determined	Good combustion practices and efficient operation for POC control.
SO_2	Gas used will not have H_2S level greater than 50ppm.	Use natural gas or treated refinery gas fuel for this level of SO_2 control.
PM	BACT 1 is not determined. BACT 2 is triggered.	BACT 2 specifies the use of natural gas or treated refinery fuel gas for PM control.

Gas Oil Hydrotreater (S-274)

Application	Condition	BACT
POC	Unit emits only fugitive POC.	BACT for control of fugitive POC emissions same as for Crude Unit (S-250) above.

Gas Oil Hydrotreater (S-275; heater rated capacity of 59.2 MMBtu/hr)

Application	Condition	BACT
NO_x	Emissions limit of 10ppm NO_x corrected to 3% O_2, dry.	Use low NO_x burners and SCR (A-275) on S-275. Will abate approx. 90% of NO_x.
POC	BACT is not determined	Good combustion practices and efficient operation for POC control.
SO_2	Gas used will not have H_2S level greater than 50ppm.	Use natural gas or treated refinery gas fuel for this level of SO_2 control.
PM	BACT 1 is not determined. BACT 2 is triggered.	BACT 2 specifies the use of natural gas or treated refinery fuel gas for PM control.

Hydrogen Plant (S-269)

Application	Condition	BACT
POC	Unit emits only fugitive POC.	BACT for control of fugitive POC emissions same as for Crude Unit (S-250) above.

Hydrogen Plants (S-270, S-271, S-272; heater rated capacity of 125 MMBtu/hr)

Application	Condition	BACT
NO_x	BACT 1 is not determined. BACT 2 is an emissions limit of 10ppm NO_x corrected to 3% O_2, dry.	Use low NO_x burners and SCR (A-270, A-110, A-112, respectively) on S-270, S-271, S-272. Will abate approx. 90% of NO_x.
POC	BACT is not determined. POC emissions limited to no more than 6.4 lb/day / heater	Use oxidizing catalysts for all three heaters for this level of POC control.
SO_2	Gas used will not have H_2S level greater than 50ppm.	Use natural gas or treated refinery gas fuel for this level of SO_2 control.
PM	BACT 1 is not determined. BACT 2 is triggered.	BACT 2 specifies the use of natural gas or treated refinery fuel gas for PM control.

Fluidized Catalytic Cracking Unit (S-254 & S-266)

Application	Condition	BACT
POC	Unit emits only fugitive POC.	BACT for control of fugitive POC emissions same as for Crude Unit (S-250) above.

Fluidized Catalytic Cracking Unit (S-255; heater rated capacity of 24 MMBtu/hr)

Application	Condition	BACT
NO_x	Emissions limit of 10ppm NO_x corrected to 3% O_2, dry.	Use low NO_x burners and SCR (A-255) on S-275. Will abate approx. 90% of NO_x.
POC	BACT is not determined	Good combustion practices and efficient operation for POC control.
SO_2	Gas used will not have H_2S level greater than 50ppm.	Use natural gas or treated refinery gas fuel for this level of SO_2 control.
PM	BACT 1 is not determined. BACT 2 is triggered.	BACT 2 specifies the use of natural gas or treated refinery fuel gas for PM control.

Fluidized Catalytic Cracking Unit (S-268; heater rated capacity of 35.9 MMBtu/hr)

Application	Condition	BACT
NO_x	BACT 1 not specified. Emissions limit of 10ppm NO_x corrected to 3% O_2, dry.	Use SCR, flue gas recirculation, low-NO_x burners and reduced-air preheat. Use low NO_x burners and SCR (A-268) on S-268.
POC	BACT is not determined	Good combustion practices and efficient operation for POC control.
SO_2	Gas used will not have H_2S level greater than 50ppm.	Use natural gas or treated refinery gas fuel for this level of SO_2 control. S-268 will be equipped with a wet gas scrubber (A-468) that removes SO_2 from the flue gas. The controlled SO_2 level in the flue gas is estimated to be 10ppm corrected to 3% O_2.
PM	BACT 1 is not determined. BACT 2 is triggered.	BACT 2 specifies the use of an electrostatic precipitator (ESP). S-268 will be equipped with an ESP (A-368).

Alkylation Unit (S-256)

Application	Condition	BACT
POC	Unit emits only fugitive POC.	BACT for control of fugitive POC emissions same as for Crude Unit (S-250) above.

Sulfuric Acid Regeneration Plant (S-276)

Application	Condition	BACT
POC	Unit emits only fugitive POC.	BACT for control of fugitive POC emissions same as for Crude Unit (S-250) above.
NO_x & SO_x	Will remove over 94% of the NO_x & SO_x from the plant.	S-276 will be equipped with a "Trimer" tail gas scrubber (A-276) for SO_2 and NOx control.

Storage Tanks – Internal Floating Roof (S-281, S-282, S-283, S-287, S-288)

Application	Condition	BACT
POC	Vapor recovery system overall efficiency of at least 95%. Satisfies BACT 1 (technologically feasible/ cost effective).	Internal floating roof tanks hooked up to one of two vapor recovery systems (A-281 & A-283), each leading to an incinerator. Tanks are also equipped with a nitrogen padding control system to maintain tank pressure.

Storage Tanks – Fixed Roof (S-285, S-286)

Application	Condition	BACT
POC	Vapor recovery system overall efficiency of at least 95%. Satisfies BACT 2 (achieved in practice). BACT 1 not determined.	Fixed roof tanks equipped with a nitrogen padding control system and steam coils. Tanks are hooked up to the A-283 vapor recovery system.

Cogeneration Plants (S-278, S-279; heater rated capacity of 193.5 MMBtu/hr)

Application	Condition	BACT
NO_x	Emissions limit of 5ppm NO_x corrected to 15% O_2, dry.	Use steam injection and SCR (A-278 & A-279) on S-278 & S-279 for this level of NO_x control.
POC	Abatement of at least 50%.	Both turbines will be equipped with oxidation catalysts (A-378 & A-379) which will achieve approximately 90% reduction.
SO_2 & PM_{10}	50ppm H_2S maximum, 29ppm avg.	Use natural gas as primary fuel, and refinery fuel gas and butane as supplemental fuels.

Cooling Tower (S-296)

Application	Condition	BACT
POC		Good operating practice and minimizing POC leaks from process equipment into the cooling water system.
PM		Equip cooling tower with drift eliminator to reduce drift loss to 0.01%.

EXXON'S PROPOSED CARFG2 OPERATIONAL PHASE EMISSIONS SOURCES WITH BACT DETERMINATIONS

New Sources

S-1020	Heartcut Tower
S-1021	Heartcut Saturation Unit
S-1022	Catalytic T_{90} Reformer
S-1023	Catalytic Naptha T_{90} Reformer
S-1024	Light Catalytic Naptha Hydrofiner
S-1025	C5/C6 Splitter
S-220	Hot Oil Furnace
S-227	Pentane (C5) Fixed Storage Tank
S-228	C5 Fixed Storage Tank
S-229	C5 Fixed Storage Tank
S-230	Hot Oil Fixed Storage Tank
S-231	Aqueous Ammonia Fixed Roof Storage Tank

Modified Sources

S-1003	Hydrocracking Unit
S-1007	Alkylation Unit
S-1011	Heavy Catalytic Naptha Hydrotreater
S-1014	Virgin Light End Unit
S-151	Waste Water Treatment Plant
S-21	Hydrogen Furnace F-301
S-22	Hydrogen Furnace F-351

Furnaces

Application	Condition	BACT
All furnaces with a design firing rate greater than or equal to 50 MMBTU/hr (S-220)	10ppmv corrected to 3% O_2, avg. over 3 hrs	Use a combination of low NOx burners and selective catalytic reduction (SCR) for this level of NOx control.
Hydrogen furnaces (S-21 & S-22)	Due to a field test in Jan 1992 not triggering BACT for NOx, a BARCT NOx level of 28ppmv is being proposed. ('92 test of furnace determined uncontrolled NOx level of 99.5ppm at 3% O_2)	Use a combination of low NOx burners and/or thermal deNOx to meet a 35ppm NOx level.
All furnaces (S-21, S-22, S-220)	Combustion of refinery fuel gas and/or LPG/pentane gases with a total reduced sulfur concentration not to exceed 65 ppmv, annualized 24hr avg based on BACT cost effectiveness discussion*. Daily limit for these furnaces not to exceed H_2S concentration of 100ppmv, avg. over 24hrs	Based on BACT #1 level being non-cost effective, BACT #2 is to modify the existing MEA scrubbing system to enhance scrubbing capabilities for the removal of H_2S** and this level of SO_2 control.
All furnaces (S-21, S-22, S-220)	28ppmv at 3% O_2, avg. over 8hrs	Best combustion practices as guaranteed by John Zink burner manufacturer for this level of CO control.

* Note: There is no annualized state average. SO2 BACT determination discussion and explanation from Exxon BAAQMD A/C dated 12/2/93, Application #10392 ppg. 9-11

** BACT#2 level determination discussion and explanation from Application #10392 as mentioned above.

Pumps

Application	Condition	BACT
Pumps in light liquid hydrocarbon service	Pumps inspected in accordance with Regulation 8, Rule 25. Leaks of POC defined as greater than 500ppm.	Use double mechanical seals with a barrier fluid. The barrier fluid shall be either: 1) vented to a control device with at least 99.5% efficiency; or 2) held at a higher pressure than the process stream pressure for this level of POC control.

Compressors

Application	Condition	BACT
Compressors in hydrocarbon service	Compressors inspected quarterly. Leaks of POC defined as greater than 500ppm.	Use "wet" dual mechanical seals with a heavy liquid barrier fluid or dual gas mechanical seals buffered with inert gases. All reciprocating compressors shall be vented to at least a 99.5% efficient control device for this level of POC control.

Valves

Application	Condition	BACT
All hydrocarbon valves	Accessible valves inspected quarterly and inaccessible valves inspected annually. Leaks of POC defined as greater than 100ppm.	Valves will be lived loaded, bellows, graphitic packed, Teflon packed, or equivalent. All hydrocarbon control valves will be live loaded with graphite packing and polished stems or equivalent for this level of POC control.

Flanges

Application	Condition	BACT
All flanges	Leaks of POC defined as greater than 500ppm.	Equipped with graphitic gaskets, except in services that are not compatibie with graphitic material for this level of POC control.

Pressure Relief Valves

Application	Condition	BACT
All pressure relief valves in hydrocarbon service	All pressure relief valves will be vented to the flaring system or fuel gas recovery system for POC control.	

Tanks

Application	Condition	BACT
New pentane storage tanks (S-227, S-228, S-229)	At least 99.5% control	Use existing vapor recovery systems (A-46, A-47, A-48, A-49). Prior to venting to units A-46 through A-49, these storage tanks will have an auto refrigeration vapor recovery system for this level of POC control.

APPENDIX I

FEDERAL CLEAN AIR ACT SECTION 182(e)(2) –

AUTHORITY FOR OFFSET EXEMPTION

Appendix I:

Federal Clean Air Act Section 182(e)(2)

FEDERAL CLEAN AIR ACT AMENDMENTS OF 1990 - OFFSET EXEMPTION AUTHORITY SECTION 182 (e)(2) (AS OF APRIL 24, 2001)

(e) Extreme Areas.- Each State in which all or part of an Extreme Area is located hall, with respect to the Extreme Area, make the submissions described under subsection (d) (relating to Severe Areas), and shall also submit the revisions to the applicable implementation plan (including the plan items) described under this subsection. The provisions of clause (ii) of subsection (c)(2)(B) (relating to reductions of less than 3 percent), the provisions of paragraphs (6), (7) and (8) of subsection (c) (relating to de minimus rule and modification of sources), and the provisions of clause (ii) of subsection (b)(1)(A) (relating to reductions of less than 15 percent) shall not apply in the case of an Extreme Area. For any Extreme Area, the terms "major source" and "major stationary source" includes (in addition to the sources described in section 302) any stationary source or group of sources located within a contiguous area and under common control that emits, or has the potential to emit, at least 10 tons per year of volatile organic compounds.

(1) Offset requirement.- For purposes of satisfying the offset requirements pursuant to this part, the ratio of total emission reductions of VOCs to total increased emissions of such air pollutant shall be at least 1.5 to 1, except that if the State plan requires all existing major sources in the nonattainment area to use best available control technology (as defined in section 169(3)) for the control of volatile organic compounds, the ratio shall be at least 1.2 to 1.

(2) Modifications.- Any change (as described in section 111(a)(4)) at a major stationary source which results in any increase in emissions from any discrete operation, unit, or other pollutant emitting activity at the source shall be considered a modification for purposes of section 172(c)(5) and section 173(a), except that for purposes of complying with the offset requirement pursuant to section 173(a)(1), any such increase shall not be considered a modification if the owner or operator of the source elects to offset the increase by a greater reduction in emissions of the air pollutant concerned from other discrete operations, units, or activities within the source at an internal offset ratio of at least 1.3 to 1. The offset requirements of this part shall not be applicable in Extreme Areas to a modification of an existing source if such modification consists of installation of equipment required to comply with the applicable implementation plan, permit, or this Act.

APPENDIX J

HEALTH AND SAFETY CODE SECTION 42301.2 –

OFFSET REQUIREMENTS: INSTALLATION/ OPERATION OF REQUIRED DEVICES/ TECHNIQUES

Professionals
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ram shall provide for all of the

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requirements established by the
environmental professionals.
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, 1993.)

Section 42300 shall do all of

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ay issue to a Title V source a
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41701, any rule or regulation
nt to this section, or presents
and that meets all of the
d the requirements for the

issuance of permits to operate are otherwise satisfied. The issuance of any variance or abatement order is a matter of state law and procedure only and does not amend a Title V permit in any way. Those terms and conditions of any variance or abatement order that prescribe a compliance schedule may be incorporated into the permit consistent with Title V and this division.

(e) Require, upon annual renewal, that each permit be reviewed to determine that the permit conditions are adequate to ensure compliance with, and the enforceability of, district rules and regulations applicable to the article, machine, equipment, or contrivance for which the permit was issued which were in effect at the time the permit was issued or modified, or which have subsequently been adopted and made retroactively applicable to an existing article, machine, equipment, or contrivance, by the district board and, if the permit conditions are not consistent, require that the permit be revised to specify the permit conditions in accordance with all applicable rules and regulations.

(f) Provide for the reissuance or transfer of a permit to a new owner or operator of an article, machine, equipment, or contrivance. An application for transfer of ownership only, or change in operator only, of any article, machine, equipment, or contrivance which had a valid permit to operate within the two-year period immediately preceding the application is a temporary permit to operate. Issuance of the final permit to operate shall be conditional upon a determination by the district that the criteria specified in subdivisions (b) and (e) are met, if the permit was not surrendered as a condition to receiving emission reduction credits pursuant to banking or permitting rules of the district. However, under no circumstances shall the criteria specify that a change of ownership or operator alone is a basis for requiring more stringent emission controls or operating conditions than would otherwise apply to the article, machine, equipment, or contrivance.

(Amended by Stats. 1994, Ch. 727, Sec. 5.)

H&S 42301.1 Issuance of Temporary Permit

42301.1. Whenever necessary and appropriate to ensure compliance with all applicable conditions prior to issuance of a permit to operate an article, machine, equipment, or contrivance, a district may issue a temporary permit to operate. The temporary permit to operate shall specify a reasonable period of time during which the article, machine, equipment, or contrivance may be operated in order for the district to determine whether it will operate in accordance with the conditions specified in the authority to construct.

(Added by Stats. 1988, Ch. 1568, Sec. 28.)

H&S 42301.2 Offset Requirements: Installation/Operation of Required Devices/ Techniques

42301.2. A district shall not require emission offsets for any emission increase at a source that results from the installation, operation, or other implementation of any emission control device or technique used to comply with a district, state, or federal emission control requirement, including, but not limited to, requirements for the use of reasonably available control technology or best available retrofit control technology, unless there is a modification that results in an increase in capacity of the unit being controlled.

(Added by Stats. 1996, Ch. 771, Sec. 5.)

APPENDIX K

LETTERS BETWEEN U.S. EPA, SCAQMD, AND REFINERS
ON SCAQMD's RULE 1304(b)(4) – OFFSET EXEMPTION

12/18 cc Jack B
Bill Fray

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, Ca. 94105-3901

RECEIVED SOUTH COAST '92 DEC 17 P 3:40 OFFICE OF PLANNING AND RULES

December 14, 1992

From JAMES M. LENTS, Ph.D. Executive Officer
To: LEYDEN Date 12/17/92
Action required by
✓ For your information action ✓ handling
Draft response for signature

(24)

Robert Trunek
Senior Vice President
Manufacturing, Engineering and Technology
ARCO Products Company
P.O Box 2570
Los Angeles, CA 90051-0570

Dear Mr. Trunek:

This letter is in response to your November 24, 1992 letter and the meeting held between our staffs on November 17, 1992 regarding offset requirements.

EPA is currently working with the South Coast Air Quality Management District (SCAQMD) on an emissions tracking system which may aid the SCAQMD in demonstrating that the current Regulation XIII, New Source Review, will meet the Clean Air Act requirements for Extreme Areas. The SCAQMD has submitted an emissions tracking system that will account for any exemptions granted by SCAQMD under Rule 1304 by providing a demonstration that sufficient offsets for such sources exist. If the SCAQMD submits, as a SIP revision, such an approvable tracking system, EPA will not require offsets for modifications from sources which the SCAQMD deems exempt from Regulation XIII pursuant to Rule 1304.

Thus, ARCO would not be required to obtain offsets for modifications at ARCO's facility to produce reformulated fuel if the SCAQMD deems the modifications exempt from offsets under Rule 1304 of Regulation XIII.

If you have any questions, please contact Matt Haber of my staff at (415) 744-1254.

Sincerely,

David P. Howekamp
Director
Air & Toxics Division

cc: James M. Lents, SCAQMD

Printed on Recycled Paper

South Coast
AIR QUALITY MANAGEMENT DISTRICT
21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (714) 396-2000

October 9, 1992

To: All Refinery Managers in Southern California

We understand that significant refinery modifications will be needed in the near future to meet the air quality related standards for gasoline legislated in the 1990 Clean Air Act Amendments (CAAA) and the more stringent standards adopted by the ARB as part of their Phase II Reformulated Gasoline strategy. Since the District is responsible for issuing permits to such projects in Southern California, we are working closely with the ARB to assist you in meeting these statutory deadlines. The District staff has already met with all affected refiners to formulate a joint strategy to expedite permit processing and compliance with the requirements of California Environmental Quality Act (CEQA).

A question has been raised by some refineries regarding the eligibility of such projects for exemption from our New Source Review (NSR) offset provision. As you know, District Rule 1304 (b)(4) exempts a new or modified unit from offset requirements if "such equipment is installed or modified solely to comply with District, state, or federal air pollution control laws, rules, regulations or orders, as approved by the Executive Officer, and provided there is no increase in maximum rating". It is important to note that Best Available Control Technology (BACT) is required in all cases.

We believe that it was the District Governing Board's clear intent to grant the NSR offset exemption to refinery constructions and modifications undertaken solely to meet state and federal mandates for clean gasoline. Other process changes that cannot be so justified should be subject to the applicable offset requirements of District's NSR regulation. The following guidelines are designed to implement this policy.

We intend to consider the entire refinery as a single unit for this purpose, and apply the following two-pronged test:

1) Is the crude throughput capacity of the refinery unchanged as a result of this project?
2) Are the new and/or modified process units consistent with the stated refining capacity?

Positive answers to both, as evidenced by the permit application, will confirm that the project is exempt from NSR offsets under District Rule 1304.

In addition, we will propose an increase in each facility's RECLAIM Baseline Allocation for the year that production is initiated. The amount of this increase will need to be assessed as each refinery's plans are more precisely defined.

I hope that this policy interpretation is of help to you in your planning efforts for making new and improved gasoline. If there are any questions or comments on this matter, please call PomPom Ganguli of my staff at (714) 396-3185.

Sincerely,

James M. Lents, Ph.D.
Executive Officer

PL:AG:pl
(LTR-RFG1)

cc: James Boyd (ARB)
Dave Howekamp (EPA, Region IX)

APPENDIX L

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

RULE 1304 (c) (4)

(formerly Rule 1304 (b) (4))

(Adopted Oct. 5, 1979)(Amended March 7, 1980)(Amended Sept. 10, 1982)
(Amended July 12, 1985)(Amended Jan. 10, 1986)(Amended August 1, 1986)
(Amended June 28, 1990)(Amended May 3, 1991)(Amended June 5, 1992)
(Amended Sept. 11, 1992)(Amended December 7, 1995)(Amended June 14, 1996)

RULE 1304. EXEMPTIONS

(a) Modeling and Offset Exemptions

Upon approval by the Executive Officer or designee, an exemption from the modeling requirement of Rule 1303 (b)(1) and the offset requirement of Rule 1303 (b)(2) shall be allowed, for the following sources.

(1) Replacements

The source is replacing a functionally identical source or is a functionally identical modification to a source and there is no increase in maximum rating, and the potential to emit of any air contaminant will not be greater from the new source than from the replaced source, when the replaced source was operated at the same conditions and as if current BACT were applied.

(2) Electric Utility Steam Boiler Replacement

The source is replacement of electric utility steam boiler(s) with combined cycle gas turbine(s), intercooled, chemically-recuperated gas turbines, other advanced gas turbine(s); solar, geothermal, or wind energy or other equipment, to the extent that such equipment will allow compliance with Rule 1135 or Regulation XX rules. The new equipment must have a maximum electrical power rating (in megawatts) that does not allow basinwide electricity generating capacity on a per-utility basis to increase. If there is an increase in basin-wide capacity, only the increased capacity must be offset.

(3) Abrasive Blasting Equipment

The source is portable abrasive blasting equipment complying with all state laws.

(4) Emergency Equipment

The source is exclusively used as emergency standby equipment for nonutility electrical power generation or any other emergency equipment as approved by the Executive Officer or designee, provided the source does

not operate more than 200 hours per year as evidenced by an engine-hour meter or equivalent method.

(5) Air Pollution Control Strategies

The source is subjected to a modification or process change solely to reduce the issuance of air contaminants. This exemption shall not apply to landfill gas control operations or to any modification or process change made for the purpose of achieving regulatory compliance.

(6) Emergencies

The source is exclusively used in emergency operations, such as emergency soil decontamination or excavation, performed by, under the jurisdiction of, or pursuant to the requirements of, an authorized health officer, agricultural commissioner, fire protection officer, or other authorized agency officer. A person shall report any emergency within one hour of such emergency to the District or within one hour of the time said person knew or reasonably should have known of its occurrence. A specific time limit for each operation will be imposed.

(7) Portable Equipment

The source is periodically relocated, and is not located more than twelve consecutive months at any one facility in the District. The residency time of twelve consecutive months shall commence when the equipment is brought into the facility and placed into operation. This paragraph does not apply to portable internal combustion engines.

(8) Portable Internal Combustion Engines

The source is periodically relocated, and is not located more than twelve consecutive months at any one facility in the District, provided that the provisions of subparagraphs (A) through (C) are met. For the purpose of this paragraph, the residency time of twelve months shall commence either when an engine is brought into the facility and placed into operation or removed from storage and placed into operation. The equipment owner or operator shall designate dedicated storage areas within the facility and demonstrate compliance with the residency time requirement by keeping records that show the equipment location and operation history. Such records shall be kept on site for at least two years and made available to the Executive Officer upon request.

(A) Emissions from the engine, by itself, do not cause an exceedance of any ambient air quality standard;

(B) Emissions from the engine do not exceed the following limits:

Volatile Organic Compounds (VOC)	55 pounds per day
Nitrogen Oxides (NO_x)	55 pounds per day
Sulfur Oxides (SO_x)	150 pounds per day
Particulate Matter (PM_{10})	150 pounds per day
Carbon Monoxide (CO)	550 pounds per day

(C) For an engine located in the SEDAB the following limits shall apply:

Volatile Organic Compounds (VOC)	75 pounds per day
Nitrogen Oxides (NO_x)	100 pounds per day
Sulfur Oxides (SO_x)	150 pounds per day
Particulate Matter (PM_{10})	150 pounds per day
Carbon Monoxide (CO)	550 pounds per day

(b) Intra-Facility Portable Equipment

(1) Upon approval by the Executive Officer or designee, using the criteria set forth below, internal combustion engines and gas turbines which must be periodically moved within a facility because of the nature of their operation shall be exempt from the allowable change in air quality concentration requirements as stated in Rule 1303 paragraph (b)(1), provided that all of the following conditions are met:

(A) The engine or turbine is used:

(i) to remediate soil or groundwater contamination as required by federal, state, or local law or by a judicial or administrative order; or

(ii) for flight-line operations.

(B) The engine or turbine is not periodically moved solely for the purpose of qualifying for this exemption.

(C) Emissions from the engine, by itself, do not cause an exceedance of any ambient air quality standard.

(D) Emissions from the engine do not exceed the following limits:

Volatile Organic Compounds(VOC)	55 pounds per day
Nitrogen Oxides (NO_x)	55 pounds per day
Sulfur Oxides (SO_x)	150 pounds per day

Particulate Matter (PM_{10})	150 pounds per day
Carbon Monoxide (CO)	550 pounds per day

(E) For an engine located in the SEDAB the following limits shall apply:

Volatile Organic Compounds (VOC)	75 pounds per day
Nitrogen Oxides (NO_x)	100 pounds per day
Sulfur Oxides (SO_x)	150 pounds per day
Particulate Matter (PM_{10})	150 pounds per day
Carbon Monoxide (CO)	550 pounds per day

(2) For the purpose of clause (b)(1)(A)(ii), flight-line operations mean operations for the ground support of military and commercial aircraft, and includes, but is not limited to, the operation of power-generating internal combustion engines and gas turbines used to support aircraft systems or start up aircraft power plants.

(c) Offset Exemptions

Upon approval by the Executive Officer or designee, an exemption from the offset requirement of Rule 1303(b)(2) shall be allowed, for the following sources.

(1) Relocations

The source is a relocation of an existing source within the District, under the same operator and ownership, and provided that the potential to emit of any air contaminant will not be greater at the new location than at the previous location when the source is operated at the same conditions and as if current BACT were applied. The relocation shall also meet either the location requirements specified in Rule 1303(b)(3), or the applicant must demonstrate to the Executive Officer or designee a net air quality benefit in the area to which the facility will locate.

In addition, the potential to emit of the combined facility for any air contaminant after the relocation shall be less than the amounts in Table A of Rule 1304 (d) whenever either the relocating facility or existing facility received the facility offset exemption pursuant to Rule 1304(d).

(2) Concurrent Facility Modification

The source is part of a concurrent facility modification with emission reductions occurring after the submittal of an application for a permit to construct a new or modified source, but before the start of operation of the

source, provided that it results in a net emission decrease, as determined by Rule 1306, and that the same emission reductions are not:

(A) required by a Control Measure of the AQMP which has been assigned a target implementation date; or

(B) required by a proposed District rule for which the first public workshop to consider such a rule has been conducted. This exclusion shall remain in effect for 12 months from the date of the workshop, or until the Executive Officer or designee determines that the proposed rule is abandoned; or

(C) required by an adopted federal, State, or District rule, regulation or statute; or

(D) from a category or class of equipment included in a demonstration program required by a District rule or regulation.

(3) Resource Recovery and Energy Conservation Projects

The source is a cogeneration technology project, resource recovery project or qualifying facility, as defined in Health and Safety Code Sections 39019.5, 39019.6, 39047.5 and 39050.5, to the extent required by state law, including Health and Safety Code Sections 42314, 42314.1, 42314.5, 41605, and 41605.5. In no case shall these sections provide an exemption from federal law.

(4) Regulatory Compliance

The source is installed or modified solely to comply with District, state, or federal air pollution control laws, rules, regulations or orders, as approved by the Executive Officer or designee, and provided there is no increase in maximum rating.

(5) Regulatory Compliance for Essential Public Services

The source is installed or modified at an Essential Public Service solely to comply with District, state, or federal pollution control laws, rules, regulations or orders, and verification of such is provided to the Executive Officer or designee; and sufficient offsets are not available in the Priority Reserve.

(6) Replacement of Ozone Depleting Compounds (ODCs)

The source is installed or modified exclusively for the replacement of ODCs, provided the replacement is performed in accordance with the

District's ODC Replacement Guidelines. The Executive Officer or designee shall publish and update, as required, such guidelines indicating the administrative procedures and requirements for the replacement of ODCs. The ODC Replacement Guidelines shall ensure to the extent possible that:

(A) the replacements minimize emission increases of VOC, or optimize such emission increases if there is a potential conflict with the requirements of subparagraphs (B), (C) or (D);

(B) the replacements are not toxic, as determined and published by the California Air Resources Board (ARB) or the federal EPA, unless no other alternatives are available;

(C) the replacements do not increase the emissions of other criteria pollutants or global warming compounds; and

(D) there are no adverse or irreversible water quality impacts through the use of such replacements.

(7) Methyl Bromide Fumigation

Any equipment or tarpaulin enclosures installed or constructed exclusively for fumigation using methyl bromide.

(d) Facility Exemption

(1) New Facility

(A) Any new facility that has a potential to emit less than the amounts in Table A shall be exempt from Rule 1303 (b)(2).

(B) Any new facility that has a potential to emit equal to or more than the amounts in Table A shall offset the total amount of emission increase pursuant to Rule 1303 (b)(2).

(2) Modified Facility

(A) Any modified facility that has a post-modification potential to emit less than the amounts in Table A shall be exempt from Rule 1303 (b)(2).

(B) Any modified facility that has a post-modification potential to emit equal to or more than the amounts in Table A shall be required to obtain offsets for the corresponding emissions increase, or the amount in excess of Table A figures if the pre-modification

potential to emit was less than the amounts in Table A in accordance with Rule 1303 (b)(2).

TABLE A

Pollutant	Emissions in Tons per Year
Volatile Organic Compounds (VOC)	4
Nitrogen Oxides (NO_x)	4
Sulfur Oxides (SO_x)	4
Particulate Matter (PM_{10})	4
Carbon Monoxide (CO)	29

(3) Determination of emissions pursuant to Table A shall include emissions from permitted equipment excluding Rule 219 equipment not subject to NSR and shall also include emissions from all registered equipment except equipment registered pursuant to Rule 2100.

(4) Emission Increases

Emission increases shall be determined pursuant to Rule 1306(b).

(5) Two-Year Limit on New Facility Exemption

Any new facility with accumulated emission increases in excess of the amounts in Table A due to permit actions within any two-year period after the date of adoption of this rule shall offset the total emission increases during such period to zero.

(e) Emission Reduction Credits Related to Positive NSR Balances

Facilities that previously provided Emission Reduction Credits for the purpose of complying with the requirement to offset positive NSR balances pursuant to Rule 1303(b)(2) after October 1, 1990 shall receive Emission Reduction Credits equal to the amount previously provided to offset their pre-modification positive NSR balance.

APPENDIX M

SUMMARY OF MAJOR TYPES OF
CaRFG2 REFINERY MODIFICATIONS

Appendix M:

Summary of Major Types of CaRFG2 Refinery Modifications:

Alkylation Units

A process unit that combines small-molecule hydrocarbon gases produced in the FCCU with a branched chain hydrocarbon called isobutane, producing a material called alkylate, which is blended into gasoline to raise the octane rating. Alkylate is a high octane, low vapor pressure gasoline blending component that essentially contains no olefins, aromatics, or sulfur. This plant improves the ultimate gasoline-making ability of the FCC plant. Therefore, many California refineries built new or modified existing units to increase alkylate production to blend and to produce greater amounts of CaRFG2.

Alkylate is produced by combining C3, C4, and C5 components with isobutane (nC4). The process of alkylation is the reverse of cracking. Olefins (such as butenes and propenes) and isobutane are used as feedstocks and combined to produce alkylate. This process enables refiners to utilize lighter components that otherwise could not be blended into gasoline due to their high vapor pressures. Feed to alkylation unit can include pentanes from light cracked gasoline treaters, isobutanes from butane isomerization unit, and C3/C4 streams from delayed coking units.

Isomerization Units – C4/C5/C6

A refinery that has an alkylation plant is not likely to have exactly enough is-butane to match the proplylene and butylene (olefin) feeds. The refiner usually has two choices – buy iso-butane or make it in a butane isomerization (BI) plant.

Isomerization is the rearrangement of straight chain hydrocarbon molecules to form branched chain products or to convert normal paraffins to their isomer. This means that the unit rearranges molecular structure of hydrocarbons, changing straight-chain hydrocarbons into branched-chain hydrocarbons of a higher octane rating. The primary benefit of isomerization is to provide octane enhancement. The available catalysts used for isomerization contain platinum on various bases.

This unit will convert n-butane (a straight chain C4 molecule) to iso-butane (a branched molecule). The butane isomerization unit is an intermediate step in the formation of alkylate, because the unit produces isobutane from feed to the new alkylation unit. Feed includes normal butanes from alkylation units.

The feed to the BI plant is normal butane or mixed butanes (iso and normal), which are sometimes called field grade butanes if they come from a gas processing plant. The butanes should not have any trace of olefins that would deactivate the catalyst.

These types of units will also convert low octane pentane (C5) and hexane (C6) molecules to high octane isopentane (nC5) and isohexane (nC6). Pentanes and hexanes are difficult to reform and are isomerized using aluminum chloride or precious metal catalysts to form gasoline blending components of fairly high octane value. This unit will also destroy benzene.

TAME Units

These units were designed to produce TAME (Tertiary Amyl Methyl Ether), an oxygenated compound which could be blended into gasoline to help meet the new reformulated gasoline oxygenate specification. The TAME plan can also reduce the olefin content and vapor pressure required for reformulated gasoline. TAME is made by reacting isoamylenes with methanol, very similar to MTBE which is formed by reacting

isobutenes with methanol. The TAME and MTBE units were built to reduce the amount of MTBE that must be imported to supplement gasoline octane and oxygenate requirements.

MTBE Units

Methyl Tertiary Butyl Ether, or MTBE, is a blending additive that increases the oxygen content of gasoline to comply with both federal and California oxygenate requirements. The ingredients for MTBE are iso-butylene and methanol. The feed consists of iso-butylene, fresh methanol, and recycle methanol. Almost 90% of the iso-butylene converts to MTBE in the MTBE plant reactor.

Some refineries built these units to have on-site production of oxygenates rather than to import oxygenates or to use this on-site production to supplement their oxygenate imports and to comply with the federal oxygenate requirement.

Hydrogen Plants

These plants are designed to produce additional hydrogen that is needed for isomerization, hydrotreating, and saturating units. Hydrogen is formed in the steam methane reformer (SMR) furnace by reacting hydrocarbons with steam in the presence of a catalyst. The SMR furnace can be equipped with low NO_x burners and SCR to reduce NO_x emissions.

Hydrotreaters

Hydrotreating is used to improve the quality of gasoline, jet fuel, and diesel fuel components. Sulfur and nitrogen compounds are removed, and olefins are saturated by adding hydrogen at high pressure in the presence of a catalyst. Hydrotreating catalyst is similar to the catalyst described under reforming, but usually contains nickel, molybdenum, and/or platinum. These units are designed to remove sulfur and other contaminants from a hydrocarbon (petroleum) with heat and pressure in the presence of a catalyst.
Distillate Hydrotreater:
This unit will process streams from a delayed coking unit and Flexicoker and crude distillation units. This unit will remove sulfur and nitrogen compounds from jet fuel, diesel fuel, and feed to the catalytic cracking unit. Gasoline Hydrotreater - Heavy Cracked: This unit will treat heavy cracked gasoline to meet the new sulfur and olefin specifications for reformulated fuels. The hydrotreating process uses hydrogen, in the presence of a metal oxide catalyst, to remove sulfur and nitrogen. Olefins (unsaturated hydrocarbons) will also be converted to paraffins.

Butamer Plant

A facility that can be built to provide additional isobutane required for the Alkylation Plant. Butane (C4) treating facilities are usually built to remove impurities from the FCC Plant butane (C4) streams that are fed to the existing Alkylation and MTBE plants to improve the yield and quality of alkylate and MTBE.

Storage Tanks

Storage for gasoline, oxygenate, alkylate, or other fuel blending materials.

Fluid Catalytic Cracking Units (FCCU)

Cracking is the breaking down of higher molecular weight hydrocarbons to lighter components by the application of heat. Cracking in the presence of a suitable catalyst produces an improvement in yield and quality over simple thermal cracking.

These units are designed to split large hydrocarbon molecules into smaller hydrocarbon molecules with the assistance of a catalyst. The FCC Plant can be the largest gasoline component producer in the refinery. It also produces feedstocks for other refinery plants, such as the alkylation, MTBE, and TAME

plants. This is a process of cracking heavy gas oil feeds and large molecules into smaller molecules in the gasoline and surrounding ranges with heat and pressure in a powdery catalyst that flows like a fluid.

Catalytic Reforming Unit (CRU)

Reforming is a process to convert naptha fractions to products of higher octane value. Catalytic reforming is applied to various straight-run and cracked naptha fractions and consists primarily of dehydrogenation of napthenes to aromatics. This process uses heat, pressure, and a catalysts to change base gasoline components into a high-octane gasoline component called reformate. The reforming catalyst material consists of small solid cylindrical structures composed of an inert based, generally alumina, and a metal, platinum.

Hydrocracking Units

Hydrocracking is the process of "cracking" long hydrocarbon molecules with high pressure under a high-hydrogen content atmosphere. This process includes mixing gas oils or residue (heavier) hydrocarbons with hydrogen under high pressure and temperature and in the presence of a catalyst to produce light oils. Catalytic cracking is designed more for (light) hydrocarbons whereas hydrocracking addresses the (heavier) hydrocarbons so that more gasoline and diesel fuels can be produced by breaking up larger chain hydrocarbons at a refinery.

APPENDIX N

SUMMARY OF SCAQMD REFINERIES
PROPOSED CARFG2 AND RELATED CLEAN FUELS
REFINERY MODIFICATIONS

Appendix N:

Summary of CaRFG2 and Related Clean Fuels Refinery Modifications in the South Coast Air Quality Management District:

In order to comply with the reformulated gasoline requirements of the federal Clean Air Act Amendments (CAAA) of 1990 and the California Air Resources Board (ARB) CaRFG2 requirements, the major refiners in the SCAQMD proposed modifications to their operations generally under name of Clean Fuels Projects. These modifications were to comply with federally mandated reformulated gasoline requirements by January 1, 1995 and California mandated reformulated gasoline requirements by March 1, 1996.

Generally, the strategy of the refiners was to implement new construction and modifications to existing facilities in stages to maintain current gasoline production levels while transitioning operations to produce reformulated fuels. Most refiners did not expect any changes to the amount of crude oil to be processed with these changes. Overall, the manner in which each refinery proposed to meet the federal and state mandated requirements for reformulated gasoline would vary considering a number of factors, including refinery layout, types of units, product slate, and types of crude oil processed. Existing on-site facilities, management strategy for future equipment construction and specific equipment modifications and construction timelines would all influence each project.

The following is a brief summary of the proposed Clean Fuels Projects in the SCAQMD:

ARCO (British Petroleum):

Location: 1801 East Sepulveda Blvd Carson, CA

Referenced Document: Final Environmental Impact Report (Vol. I)
State Clearinghouse No.: 92091041 July 1993
Throughput Capacity: 242,000 barrels per day
Primary products & Production: Gasoline (52%), Jet fuel (17%), and Diesel (18%)
Facility size: ~ 680 acres

Construction and installation of the following units or systems that were proposed for ARCO's Clean Fuels Projects:

* Two dehexanizer towers
* Naptha hydrodesulfurization (HDS)
* Naptha isomerization unit
* New hydrogen plant
* FCCU depentanizer & jet stripper distillation tower
* Alkylation unit
* New boilers
* Additional tankage capacity
* C5 treater
* C4 isomerization unit
* New cooling tower
* Railroad facilities
* Process & storm water sewers
* New pipelines
* Control rooms

Modifications to the following existing units or systems that were proposed:

* Crude oil distillation units
* Super fractionation area (SFIA)
* Fluid catalytic cracker HDS unit (FFHDS)
* UDEX unit – aromatic extraction & sales
* Flare system
* Reformers
* Hydrocracker
* Mid-barrel treater
* Existing pipelines

CHEVRON :

Location: 324 West El Segundo Blvd El Segundo, CA

Referenced Document: Revised Draft Environmental Impact Report (Vol. I)
State Clearinghouse No.: 92111028 December 1994
Throughput Capacity: 254,000 barrels per day
Primary products & Production:
Facility size: ~ 1,000 acres

The construction of new units and proposed modifications for Chevron's Clean Fuels Projects included installation of the following items:

* Alkylation Plant
* Catalytic Reforming Unit
* Cogeneration Plant
* Hydrogen Recovery Plant
* Isomax Naptha Hydrotreater
* Naptha Hydrotreater
* Naptha Prefractionator Unit
* Penex Isomerization Unit
* Tertiary Amyl Methyl Ether (TAME) Plant

MOBIL (EXXON-MOBIL):

Location: 3700 W. 190TH Street Torrance, CA

Referenced Document: Final Environmental Impact Report (Vol. IB)
State Clearinghouse No.: 93011009 February 1994
Throughput Capacity: 160,000 barrels per day
Primary products: motor & aviation fuels, jet fuels, diesel fuel, MTBE
Facility size: ~ 734 acres

The construction of new units and proposed modifications for Mobil's Clean Fuels Projects included installation of the following items:

* Alkylation Plant
* Boilers
* Catalytic Hydrodesulfurization Unit
* Crude Distillation Unit
* FCC Feed Hydrotreater
* Fluid Catalytic Cracking Unit
* Hydrocracking Unit
* Hydrogen Plant
* LPG Merox Unit
* Naptha Pretreater
* Saturate Gas Plant
* Selective Catalytic Reduction
* Storage Tanks
* Unsaturate Gas Plant

TEXACO (EQUILON):

Location: 2101 E. Pacific Coast Highway Wilmington, CA

Referenced Document: Final Environmental Impact Report (Vol. IB)
State Clearinghouse No.: 93021057 March 1994
Throughput Capacity: 100,000 barrels per day
Primary products: aviation & motor gasolines, jet fuel, diesel fuels, LPG
Facility size: ~ 299 acres

Construction and installation of the following units or systems that were proposed for Texaco's Clean Fuels Projects:

* Butane/Butylene Selective Hydrogenation Unit
* Methyl Tertiary Butyl Ether (MTBE) Unit
* Pentane/Pentylene Selective Hydrogenation Unit
* Tertiary Amyl Ether (TAME) Unit
* Pentylene Skeletal Isomerization Unit
* Butane Isomerization Unit
* Hydrogen Generation Unit
* Naptha hydrodesulfurization unit
* Storage Tanks

Modifications to the following existing units or systems that were proposed:

* Catalytic Reforming unit No.1 - converted to benzene reduction (saturation) unit
* Fluid Catalytic Cracking unit - fractionation & recovery sections will be modified.
* Alkylation unit - capacity will be increased significantly.
* Hydrogen Generation Unit No.1 – modified to charge a light gasoline stream.
* Catalytic Reforming Unit No.2 – Product Splitter will be modified.
* Feed pretreatment facilities for Alkylation unit - modified to increase capacity.
* Catalytic Reforming Unit No.3 – Splitter Reboiler Heater to be recommissioned.
* Hydrocracking Unit – recovery section will be modified.

ULTRAMAR:

Location: 2402 East Anaheim Street Wilmington, CA

Referenced Document: Final Subsequent Environmental Impact Report (Vol. IB)
State Clearinghouse No.: 92111042 August 1994
Throughput Capacity: 70,000 barrels per day
Primary products: gasoline, jet fuels, diesel fuels
Facility size: ???

Construction and installation of the following units or systems that were proposed for Ultramar's Clean Fuels Projects:

* Gas Oil Hydrotreater
* Hydrogen Plant
* Cogeneration Plant
* Naptha Hydrotreater
* Naptha Splitter
* Benzene Reduction Unit
* Storage Tanks
* Deisobutanizer Column
* Diesel Aromatic Saturation Unit
* Distillation Unit
* LPG Sphere
* MTBE/ TAME Complex

Modifications to the following existing units or systems that were proposed:

* Alkylation Plant
* Amine Regeneration Unit
* Boilers
* Butamer Plant
* Cooling Tower
* FCC Gasoline Merox Unit
* Flare System
* FCCU
* LPG Merox Unit
* MTBE Unit
* Selective Catalytic Reduction
* Sulfur Plant

UNOCAL (PHILLIPS):

Location: Carson Refinery 1520 East Sepulveda Boulevard Carson, CA
Wilmington Refinery 1660 West Anaheim Street Wilmington, CA

Referenced Document: Final Environmental Impact Report (Vol. I)
State Clearinghouse No.: 93011013 November 1993
Throughput Capacity: 135,000 barrels per day
Primary products: gasoline, aviation gasoline, jet fuels, diesel fuels
Facility size: ???

Construction and installation of the following units or systems that were proposed for Unocal's Clean Fuels Projects in Wilmington unless otherwise noted:

* Cogeneration Unit (Carson)
* Naptha Hydrotreater (Carson)
* Flare System
* Butamer Unit
* Cooling Tower
* Hydrogen Plant
* Alkylation Unit
* Storage Tanks

Modifications to the following existing units or systems were proposed:

* Alkylation Plant (Carson)
* Benzene Reduction Unit
* Catalytic Light End Fractionation Unit
* Hydrocracker
* Mid-barrel processing Unit
* Sulfur Plant
* Hydrotreater/Reformer

APPENDIX O

DETAILED MATRIX OF THE SCAQMD REFINERIES
CARFG2 AND RELATED CLEAN FUELS REFINERY MODIFICATIONS

South Coast Refiners Project Description	ARCO (Carson)		CHEVRON (El Segundo)		MOBIL (Torrance)		TEXACO (Wilmington)		ULTRAMAR (Carson & Wilmington)		UNOCAL (Carson & Wilmington)	
	New	Mod.	New	Mod.	New	Mod.	New	Mod.	New	Mod.	New	Mod.
Air compressor	X											
Air Separation Unit									X			
Alkylation Plant	X		X			X		X		X		X
Amine Regeneration Unit										X		
Aromatic Extraction Unit		X										
Benzene Reduction (Saturation) Unit								X	X			X
Boilers	X				X					?		
Butamer Plant										X	X	
Butane Isomerization Unit	X						X					
Butane/Butlyene Selective Hydrogenation Unit							X					
C5 Treater	X											
Catalytic Hydrodesulfurization (HDS)					X							
Catalytic Light End Fractionation Unit												X
Catalytic Reforming Unit				X				X				
CO2 Recovery System									X			
Cogeneration Plant			X						X		X	
Continuous Catalyst Regeneration Reforming Unit												
Cooling Tower	X									X	X	
Crude Distillation Unit						X						
Debutanizer		X										
Dehexanizer	X											
Deisobutanizer Column									X			
Depentanizer		X										
Diesel Aromatic Saturation Unit									X			
Distillation Unit									X			
FCC Feed Hydrotreater						X						
FCC Gasoline Merox Unit										X		
FCC Hydrodesulfurization Unit		X										
Flare System	X									X	X	
Fluid Catalytic Cracking Unit (FCCU)		X				X		X		X		
Gas Oil Hydrotreater									X			
Hydrocracker		X				X		X				X

South Coast Refiners Project Description	ARCO (Carson)		CHEVRON (El Segundo)		MOBIL (Torrance)		TEXACO (Wilmington)		ULTRAMAR (Carson & Wilmington)		UNOCAL (Carson & Wilmington)	
	New	Mod.	New	Mod.	New	Mod.	New	Mod.	New	Mod.	New	Mod.
Hydrogen Plant	X		X			X		X	X		X	
Isomax Naptha Hydrotreater				X								
Isomerization Unit												X
LPG Merox Unit						X				X		
LPG Sphere									X			
Mid-Barrel Treater		X										X
MTBE Unit							X			X		
Naptha Hydrodesulfurization Unit	X						X					
Naptha Hydrotreater				X					X		X	
Naptha Isomerization Unit	X											
Naptha Prefractionator Unit			X									
Naptha Pretreater						X						
Naptha Splitter		X							X			
Olefin Treater										X		
Penex Isomerization Unit				X								
Pentane/Pentlyene Selective Hydrogenation Unit							X					
Pentlyene Skeletal Isomerization Unit							X					
Process Wastewater System		X								X		X
Reformers		X									X	
Saturate Gas Plant						X						
Selective Catalytic Reduction (SCR)					X					X		
Storage Tanks	X				X		X		X		X	
Sulfur Plant										X		X
Tertiary Amyl Methyl Ether (TAME) Plant				X			X		X			
Unsaturate Gas Plant						X						

APPENDIX P

SUMMARY OF BAAQMD REFINERIES
PROPOSED CARFG2 AND RELATED CLEAN FUELS
REFINERY MODIFICATIONS

Appendix P:

Summary CaRFG2 and Related Clean Fuels Refinery Modifications in the Bay Area Air Quality Management District:

In order to comply with the reformulated gasoline requirements of the federal Clean Air Act Amendments (CAAA) of 1990 and the California Air Resources Board (ARB) CaRFG2 requirements, major refiners in the BAAQMD proposed modifications to their operations generally under the name of Clean Fuels Projects. These modifications were to comply with federally mandated reformulated gasoline requirements by January 1, 1995 and California mandated reformulated gasoline requirements by March 1, 1996.

Generally, the strategy of the refiners was to implement new construction and modifications to existing facilities in stages to maintain current gasoline production levels while transitioning operations to produce reformulated fuels. Most refiners did not expect any changes to the amount of crude oil to be processed with these changes. Overall, the manner in which each refinery proposed to meet the federal and state mandated requirements for reformulated gasoline would vary considering a number of factors including refinery layout, types of units, product slate, and types of crude oil processed. Existing on-site facilities, management strategy for future equipment construction and specific equipment modifications and construction timelines would all influence each project.

The following is a brief summary of the proposed Clean Fuels Projects in the BAAQMD:

CHEVRON:

Location: 841 Chevron Way Richmond, CA
Lead Agency: City of Richmond
Referenced Document: Draft Environmental Impact Report (Vol. I)
State Clearinghouse No.: 92113007 August 1993
Throughput Capacity: 245,000 barrels per day
Primary products: motor gasoline, jet & diesel fuel, lubricating oils, LPG
Facility size: ~ 2,900 acres

Construction and installation of the following units or systems that were proposed for Chevron's Clean Fuels Projects:

* Butamer Plant
* C4 Treating Unit
* Cooling Tower
* LPG Sphere
* Reformate Splitting Column
* Storage Tanks
* Tertiary Amyl Methyl Ether Plant (TAME Plant)

Modifications to the following existing units or systems that were proposed:

* Alkylation Plant
* C4's Selective Hydrogenation Unit
* Debutanizer
* FCC Gasoline Hydrotreating Plant
* Fluid Catalytic Cracking Unit
* Sulfur Plant
* Benzene Reduction Unit
* Depropanizer
* Deisobutanizer Column
* Flare System
* Hydrogen Recovery Plant

EXXON (VALERO):

Location: 3400 East 2nd Street Benicia, CA
Lead Agency: City of Benicia
Referenced Document: Draft Environmental Impact Report
State Clearinghouse No.: 93C0336A September 1993
Throughput Capacity: ~ 135,000 barrels per day
Primary products & production: gasoline (110,000 bpd), jet fuel (20,000 bpd), diesel fuel (15,000 bpd), and smaller amounts of other products.
Facility size: ~ 800 acres

Construction and installation of the following units or systems that were proposed for Exxon's Clean Fuels Projects:

* Benzene Reduction Unit
* Catalytic Reforming Unit
* Mid-Barrel Treater
* Selective Catalytic Reduction
* Methanol Feed Tank
* C5/C6 Splitter
* Methanol Feed Tank
* MTBE Process Unit
* Storage Tanks
* Hot Oil System

Modifications to the following existing units or systems that were proposed:

* Alkylation Unit
* Hydrogen Plant
* Hydrogen Furnaces
* Hydrocracking Unit

SHELL (EQUILON):

Location: 3485 Pacheco Blvd Martinez, CA
Lead Agency: Contra Costa county
Referenced Document: Draft Environmental Impact Report (Vol. I)
State Clearinghouse No.: 92093028 May 1993
Throughput Capacity: 154,000 barrels per day (?)
Primary products: gasolines, jet fuel, diesel, petroleum gases, coke, sulfur
Facility size: 881 acres

The construction of new units and proposed modifications for Shell's Clean Fuels Projects included installation of the following items:

* Alkylation Unit
* Benzene Reduction Unit
* Boilers
* Butane Isomerization Unit
* C5/C6 Isomerization Unit
* Catalytic Reforming Unit
* Cogeneration Unit
* Coking Unit
* Cooling Tower
* Distillation Unit
* Flare System
* Hydrogen Plant
* Hydrotreaters
* Light Cracked Gasoline Treater
* Storage Tank
* Sulfur Recovery Plant

TOSCO (ULTRAMAR DIAMOND SHAMROCK):

Location: 150 Solano Ave Avon, CA
Lead Agency: Contra Costa county
Referenced Document: Draft Environmental Impact Report (Vol. I)
State Clearinghouse No.: 93111061 July 1994
Throughput Capacity: 145,000 barrels per day
Primary products: gasoline, jet fuel, diesel fuel
Facility size: 2,200 acres

Construction and installation of the following units or systems that were proposed for Tosco's Clean Fuels Projects:

* Benzene Saturation Unit
* Light Naptha Hydrodesulfurizer
* Selective Hydrogenation Unit
* Tertiary Amyl Methyl Ether Unit
* FCC Hydrodesulfurizer Unit
* Storage Tanks
* Boiler Plant
* Butane Isomerization Unit

Modifications to the following existing units or systems that were proposed:

* Alkylation Plant
* Catalytic Hydrodesulfurizer
* Crude Unit
* Flare System
* Gas Plant Fractionator
* Hydrocracker
* Hydrogen Plant
* MTBE Unit
* Reformate Fractionator
* Storage Tanks

UNOCAL (PHILLIPS):

Location: 1380 San Pablo Ave. Rodeo, CA
Lead Agency: Contra Costa county
Referenced Document: Draft Environmental Impact Report (Vol. I)
State Clearinghouse No.: 93121027 June 1994
Throughput Capacity: 73,000 barrels per day (?)
Primary products: gasoline, diesel, jet fuel, fuel oil, refinery fuel
Facility size: 1,100 acres

Construction and installation of the following units or systems that were proposed for Unocal's Clean Fuels Projects in Rodeo, unless otherwise noted:

* Benzene Reduction Unit
* Boilers
* Cooling Tower
* Deisopropanizer
* Gasoline Blending
* Hydrogen Plant
* Isomerization Unit
* Reformate Splitting Column
* Storage Tanks

APPENDIX Q

DETAILED MATRIX OF THE BAAQMD REFINERIES
CARFG2 AND RELATED CLEAN FUELS REFINERY MODIFICATIONS

Bay Area Refiners Project Description	CHEVRON (Richmond)		EXXON (Benicia)		SHELL (Martinez)		TOSCO (Martinez)		UNOCAL (Rodeo)	
	New	Mod.	New	Mod.	New	Mod.	New	Mod.	New	Mod.
Air Separation Unit								X		
Alkylation Plant		X		X	X			X		
Benzene Reduction (Saturation) Unit		X	X				X		X	
Boilers					X		X		X	
Butamer Plant	X									
Butane Isomerization Unit					X		X			
Butane/Butlyene Selective Hydrogenation Unit		X								
C4 Treater	X									
C5/C6 Isomerization Unit			X		X					
Catalytic Hydrodesulfurization (HDS)								X		
Catalytic Reforming Unit			X		X					
Cogeneration Plant					X					
Cooling Tower	X				X				X	
Depropanizer		X								
Debutanizer		X								
Deisobutanizer Column		X								
Deisopentanizer									X	
Distillate Hydrotreater					X					
Distillation Unit					X					
FCC Feed Hydrotreater							x			
FCC Gasoline Hydrotreating Plant		X								
FCC Hydrodesulfurization Unit							X			
Flare System		X			X			X		
Fluid Catalytic Cracking Unit (FCCU)		X								
Gas Plant Fractionator								X		
Gasoline Blender										X
Gasoline Hydrotreater					X					
Hydrocracker				X				X		
Hydrogen Plant				X	X			X	X	
Hydrogen Recovery Plant		X								
Isomerization Unit										X
Light Cracked Gasoline Treater					X					
LPG Sphere	X									
Methanol Feed Tank			X							
Mid-Barrel Treater			X							
MTBE Process Unit			X							
Naptha Hydrodesulfurization Unit							X			
Pentane Isomerization Unit							X			
Process Wastewater System										X
Reformate Splitting Column	X								X	
Selective Catalytic Reduction (SCR)			X							
Selective Hydrogenation Unit							X			
Storage Tanks	X		X		X		X		X	
Sulfur Plant		X			X					
Tertiary Amyl Methyl Ether (TAME) Plant	X						X			