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