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