SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Negative Declaration for:
Chevron Products Company Refinery
Proposed Hydrogen Plant Project

July, 2003

SCH#2003051116

Submitted to:
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Prepared by:
ENVIRONMENTAL AUDIT, INC.

Reviewed by: Mike Krause - Air Quality Specialist
Steve Smith, Ph.D. - Program Supervisor
Mike Harris, Senior Deputy District Counsel

PREFACE

This document constitutes the Final Negative Declaration (ND) for the Chevron Products Company Refinery Proposed Hydrogen Plant Project. The Draft ND was released for a 30-day public review and comment period from May 23, 2003 to June 24, 2003. Two comment letters were received from the public. The comment letters and responses are in Appendix E of this document. Minor modifications have been made to the Draft such that it is now a Final ND. Additions to the text of the ND are denoted using italics.

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DABWORD:2184:TOC

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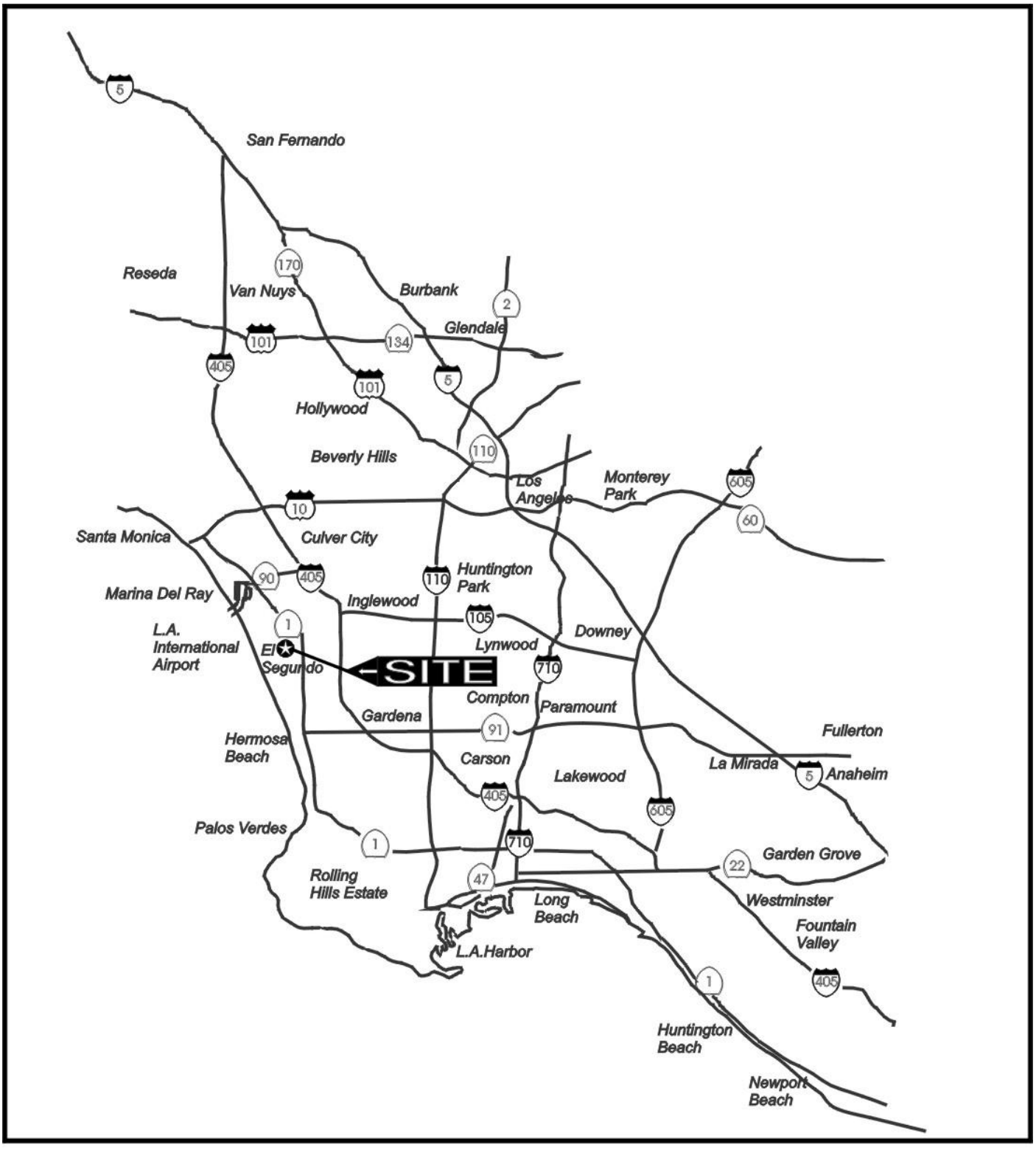
1.1 INTRODUCTION

Chevron Products Company (Chevron) is proposing to build a new Hydrogen Plant at the existing Chevron El Segundo Refinery (see Figures 1 and 2). The Hydrogen Plant will produce gaseous hydrogen and steam for use in Refinery process units. Chevron's proposed project has been developed to comply with the South Coast Air Quality Management (SCAQMD) District's Rule 1189 which regulates emissions from hydrogen plants. Hydrogen is used in various aspects of petroleum refining.

SCAQMD Rule 1189 (c)(3) states that after January 1, 2003, the total VOC emissions from all process vents of the hydrogen Steam Methane Reformer (SMR) plant combined, are to be less than 2.5 pounds of volatile organic compounds (VOC) per million standard cubic feet of hydrogen. The compliance date can be extended to July 1, 2003, with a written statement to the SCAQMD's Executive Officer by January 1, 2003 indicating that a retrofit is required to comply. After review of various options available to achieve compliance with Rule 1189, Chevron determined that the most efficient and effective way to comply was to build a new Hydrogen Plant and demolish the existing Steam Methane Reformer hydrogen plant. Another existing hydrogen plant at the Chevron Refinery referred to as the Steam Naphtha Reformer is expected to be in compliance with Rule 1189 by July 1, 2003. Operation of the new Hydrogen Plant offers substantial environmental benefits, including: reduced VOC emissions from process vents and reduced emissions of other criteria pollutants (e.g., example, nitrogen oxides (NOx) and sulfur oxides (SOx)). Under Rule 1189 (d)(2), the total VOC emissions from all process vents of a new or reconstructed hydrogen plant combined must be less than 0.5 pound of VOC per million standard cubic feet of hydrogen produced.

Chevron and the SCAQMD entered into an Order for Abatement in June 2002 to reduce emissions at the Refinery. The Order of Abatement included the demolition of the existing Steam Methane Reformer hydrogen plant and construction of a new Hydrogen Plant, which is expected to be completed by December 31, 2004. During the period from July 1, 2003, until the completion of the construction of the Hydrogen Plant (i.e., December 2004), excess emissions of VOCs are expected since Chevron will not be in compliance with SCAQMD Rule 1189. In order to offset excess VOC emissions during the period of non-compliance, Chevron has been ordered to surrender an equivalent amount of VOC emission reduction credits. Chevron also agreed to several other VOC emission reduction measures at the Refinery, including installation of a flare gas recovery system. The flare gas system has already been installed.

The new Hydrogen Plant is being developed by Air Liquide America, LP for Chevron. Chevron will be the operator of the Hydrogen Plant with Air Liquide as the legal owner. The new Hydrogen Plant will come under the Refinery's existing Title V and RECLAIM permits. Although legally owned by Air Liquide, the new Hydrogen Plant as a support facility will fall under Rule 1302(p) and Rule 2000(c)(37) definition of facility: "any



Environmental Audit, Inc.®

REGIONAL MAP

Figure 1

Project No. 2184

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SITE LOCATION MAP
324 West El Segundo Boulevard
El Segundo, California

Figure 2

Project No. 2184
N:\2184\Site Map Topo.CDR

source or grouping of sources or other air contaminant-emitting activities which are located on one or more contiguous properties within the Basin in actual physical contact, or separated solely by a public roadway or other public right-of-way, and are owned or operated by the same person (or by persons under common control)."

1.2 AGENCY AUTHORITY

The California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et seq., requires that the environmental impacts of proposed "projects" be evaluated and that feasible methods to reduce, avoid or eliminate significant adverse impacts of these projects be identified and implemented. The proposed modifications constitute a "project" as defined by CEQA. To fulfill the purpose and intent of CEQA, the SCAQMD is the "lead agency" for this project and has prepared this Negative Declaration to address the potential environmental impacts associated with the proposed construction of a new Hydrogen Plant at the Chevron Refinery.

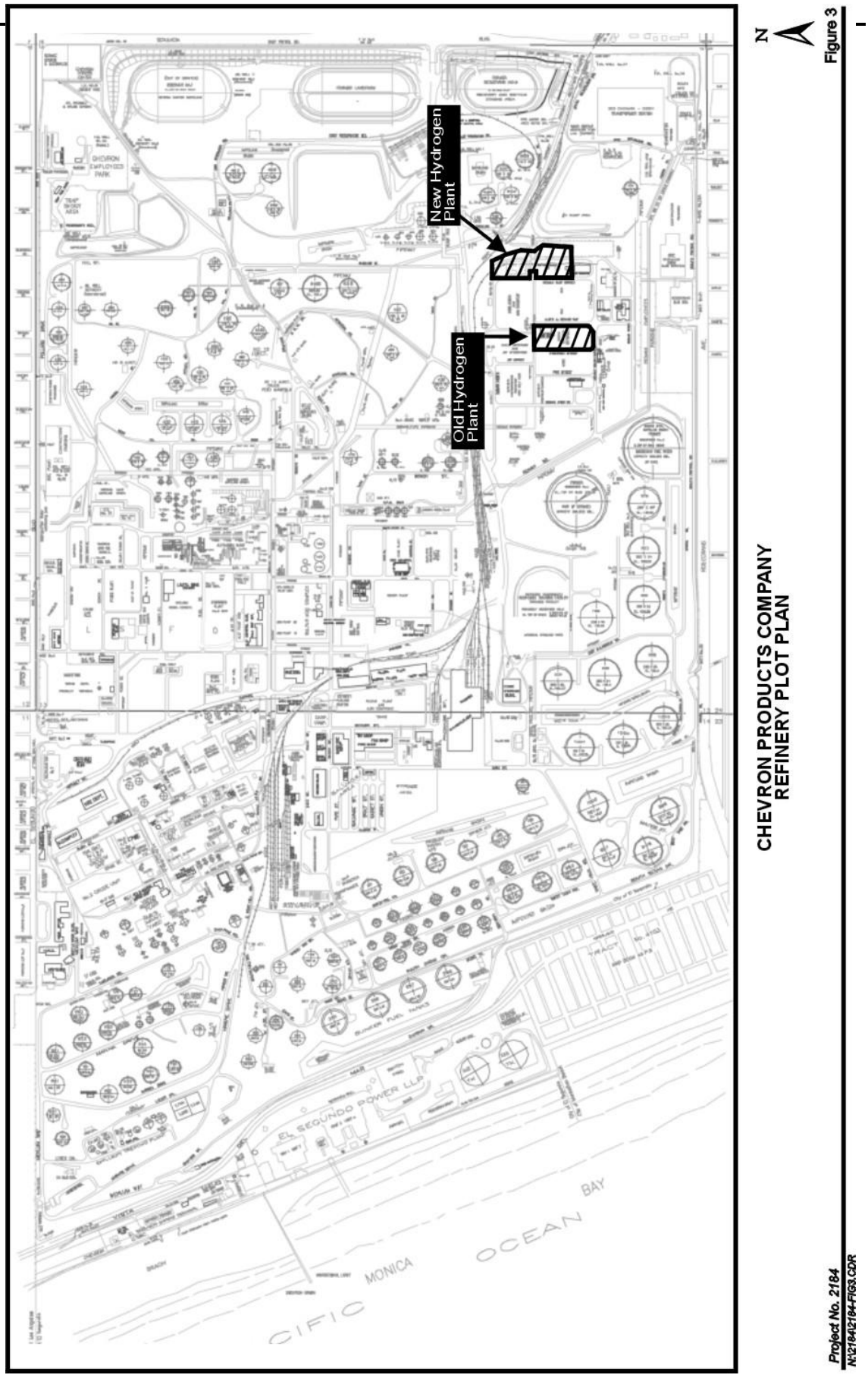
The lead agency is the public agency that has the principal responsibility for carrying out or approving a project that may have a significant adverse effect upon the environment (Public Resources Code §21067). Since the proposed project requires discretionary approval from the SCAQMD and the SCAQMD has the greatest responsibility for supervising or approving the project as a whole, it was determined that the SCAQMD would be the most appropriate public agency to act as lead agency (CEQA Guidelines §15051(b)).

To fulfill the purpose and intent of CEQA, the SCAQMD has prepared this Negative Declaration to address the potential adverse environmental impacts associated with the proposed project. A Negative Declaration for a project subject to CEQA is prepared when an analysis of the project identifies potentially significant effects; but revisions in the project plans or proposals made by, or agreed to by, and the developed mitigation measures, would avoid the significant effects or mitigate the effects to a point where clearly no significant effects would occur (CEQA Guidelines §15070(b)).

1.3 PROJECT LOCATION

The Chevron Refinery (Refinery) is located at 324 West El Segundo Boulevard in the City of El Segundo, California. The Refinery occupies a rectangular-shaped parcel of land totaling approximately 1,000 acres south of the Los Angeles International Airport and west of the San Diego Freeway (I-405) on the shore of Santa Monica Bay. The Refinery is bordered on all four sides by roads: El Segundo Boulevard to the north, Sepulveda Boulevard to the east, Rosecrans Avenue to the south, and Vista Del Mar to the west. The proposed new Hydrogen Plant will be constructed within the boundaries of the existing Refinery. The location of the proposed new Hydrogen Plant is shown in Figure 3.

Chevron Proposed Hydrogen Plant



Regional access to the Refinery is provided by Interstate 405, which runs north-south approximately 0.5 mile east of the Refinery. The terminus of Interstate 105 with Interstate 405 is located about 0.75 mile north of the Refinery. The main entrance to the administrative offices at the Refinery is on El Segundo Boulevard.

1.4 OVERVIEW OF CURRENT OPERATIONS

Crude oil is a mixture of hydrocarbon compounds and relatively small amounts of other materials, such as oxygen, nitrogen, sulfur, salt, and water. Petroleum refining is a coordinated arrangement of manufacturing processes designed to produce physical and chemical changes in the crude oil to remove most of the non-hydrocarbon substances, break the crude oil into its various components, and blend them into various useful products. The overall refining process uses four kinds of techniques: (1) separation, including distilling hydrocarbon liquids into gases, gasoline, diesel fuel, fuel oil, and heavier residual materials; (2) cracking or breaking large hydrocarbon molecules into smaller ones by thermal or catalytic processes; (3) reforming using heat and catalysts to rearrange the chemical structure of a particular oil stream to improve its quality; and (4) combining by chemically combining two or more hydrocarbons to produce high-grade gasoline.

Hydrogen is an important gas currently produced at the Refinery and used in refinery process units. Hydrogen is added to various refinery streams and processes to reduce sulfur, nitrogen, benzene and olefin content of finished products, including gasoline. All hydrogen currently produced at the Refinery is used by Chevron and no hydrogen is sold to third parties or transported off-site.

The Chevron Refinery produces a variety of products including gasoline, jet fuel, diesel fuel, petroleum gases, petroleum coke, residual fuel, sulfur and various unfinished intermediate feedstocks.

1.5 PROJECT DESCRIPTION

The proposed Hydrogen Plant will supply hydrogen and steam to the Chevron Refinery. The facility may also sell a portion of its hydrogen production to other customers in the Los Angeles area. A portion of the steam will be used in the hydrogen production process, but most will be transported by pipeline to other units within the Refinery.

- The proposed Hydrogen Plant has the capacity to produce 90 million standard cubic feet per day (MMscfd) of hydrogen and 227,000 pounds per hour of steam. The design basis for the Hydrogen Plant is steam reforming of the following four types of feedstock – refinery fuel gas, pentane, natural gas and anhydrous ammonia. A simplified process flow diagram is shown in Figure 4. Generally, the process passes feed gas and steam over a catalyst to produce hydrogen. Medium pressure steam,

Chevron Proposed Hydrogen Plant

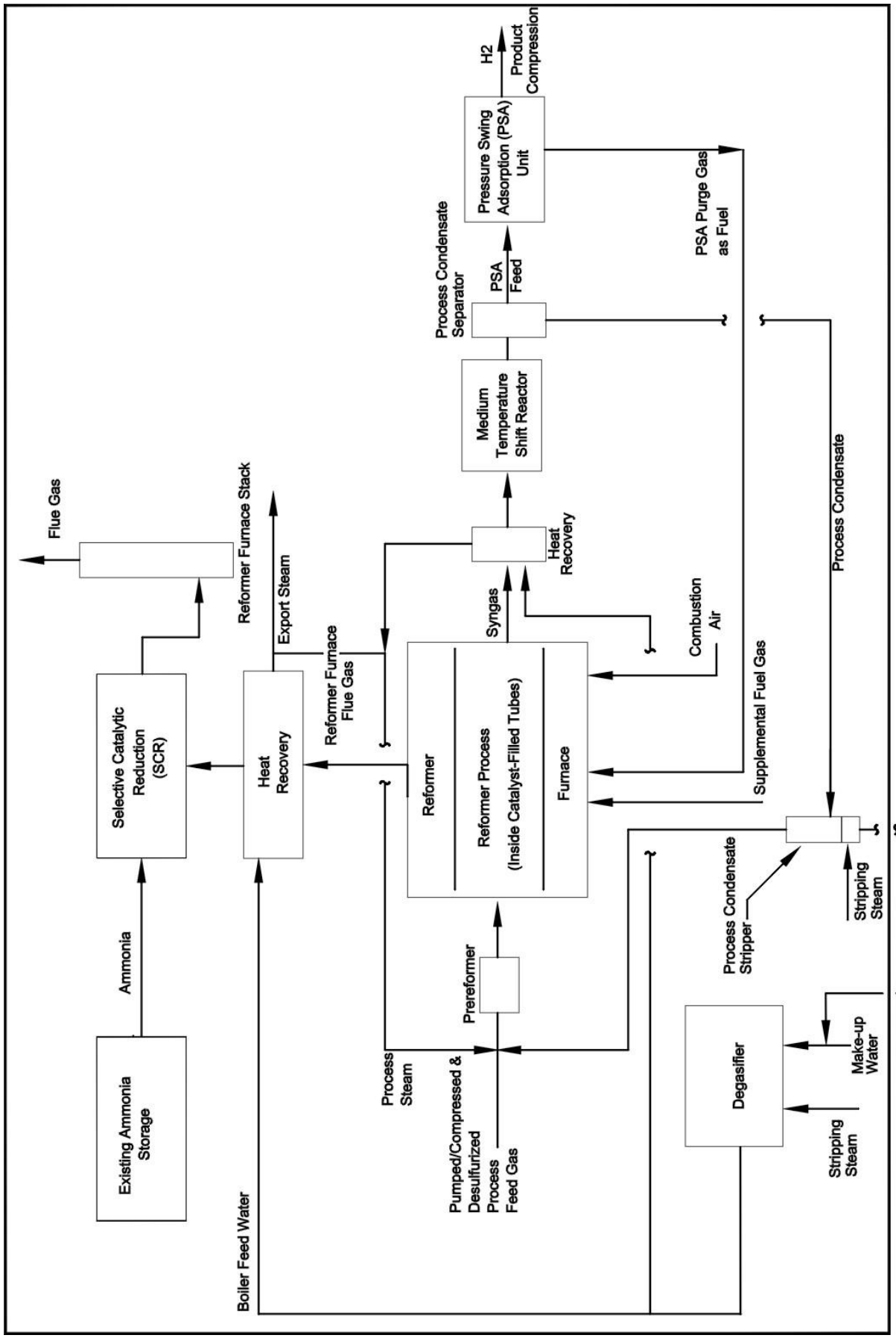


FIGURE 4

I:\2184\Hydrogen Plant Process Flow Diagram

produced by heat recovery in the Hydrogen Plant, will be generated and distributed to other units and used within the Hydrogen Plant. A preliminary plot plan for the proposed Hydrogen Plant is shown in Figure 5.

The seven processing steps for the hydrogen and steam systems can be categorized as follows. More detailed descriptions of each of these processes are provided below.

- Feed stock compression/pumping and pretreatment;
- Pre-reforming;
- Steam methane reforming (SMR) and heat recovery;
- Medium temperature shift conversion;
- Purification of the process gas by Pressure Swing Adsorption (PSA);
- Product compression; and
- Waste heat recovery/steam generation.

Feed Stock Compression and Pumping

Feed stocks to the reformer can include refinery fuel gas, natural gas, pentane and ammonia. Compressors will be used to compress the feed gases (refinery fuel gas, and natural gas) to the reformer and the facility's hydrogen product. Process pumps will be used to elevate the feed pressure of the liquid feed stocks (pentane and ammonia). The compressors will be multi-stage and oil lubricated. For the feed compression service, the compressors elevate the feed gas pressure to the process requirement, prior to the preheating and purification steps.

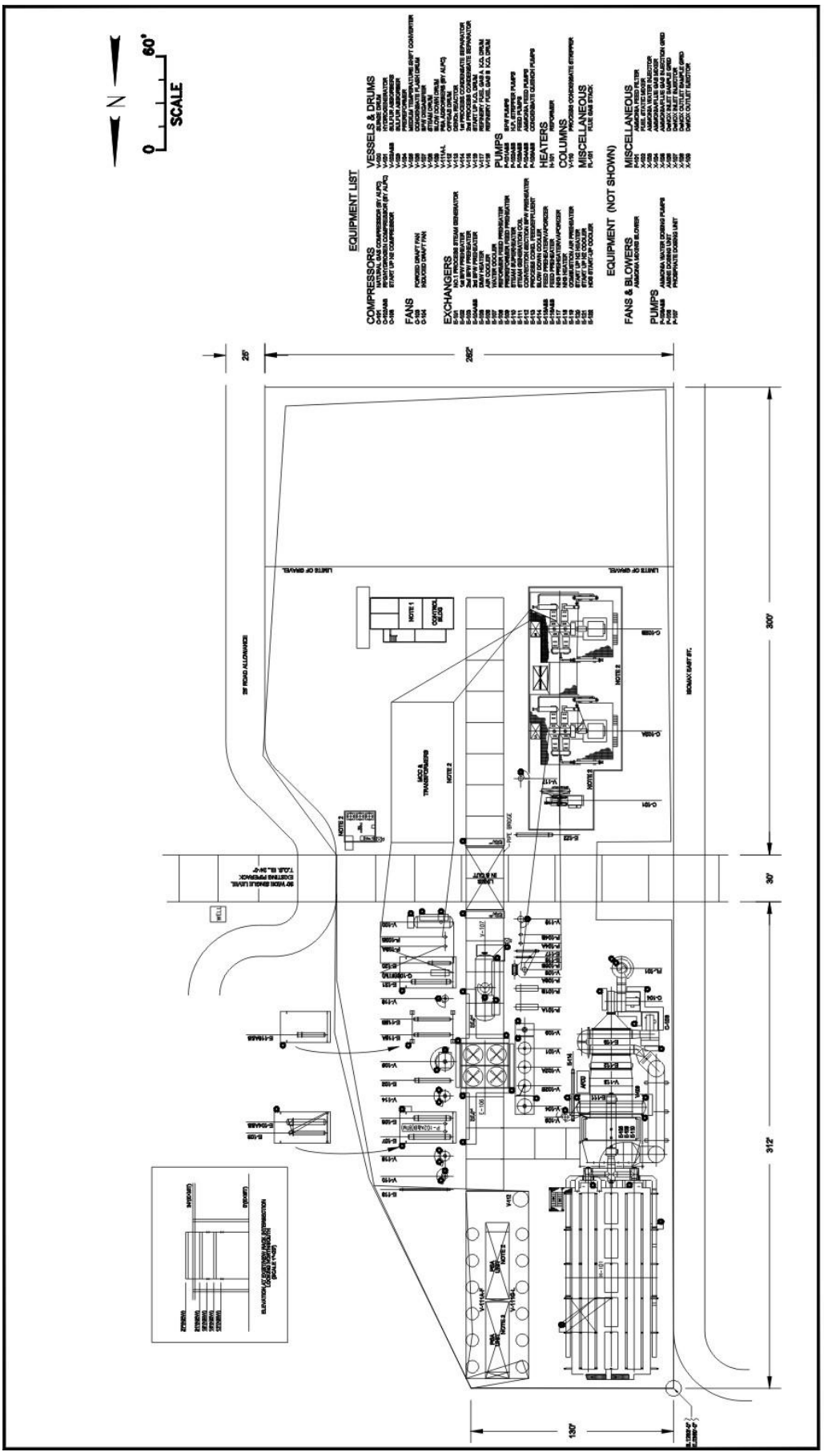
Feed Purification

The feed gas from the feed compressors will be heated in a feed preheater using steam generated by the heat recovery section of the Hydrogen Plant. The feed gas will then be sent to the feed hydrogenation reactor, where organic sulfur will be hydrogenated to hydrogen sulfide over the cobalt/molybdenum catalyst. The hydrogenation reactor will be followed by two feed sulfur absorbers in series to remove the hydrogen sulfide from the feed gas, using a zinc oxide catalyst.

When anhydrous ammonia is used as a feed stock it will be desulfurized in a separate train. The sulfur will be absorbed on a separate catalyst to remove hydrogen sulfide as well as organic sulfur compounds.

Steam Methane Reforming and Heat Recovery

After purification, the feed gas will be mixed with process steam before going to the reformer. A prereformer feed preheater will also be incorporated in the process design to optimize the facility's overall performance. The prereformer vessel will be filled with a prereforming catalyst. Mixed feed gas that has been preheated will pass through the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60'
SCALE
EQUIPMENT LIST
COMPRESSORS
FANS
EXCHANGERS
VESSELS & DRUMS
PUMPS
HEATERS
COLUMNS
MISCELLANEOUS
EQUIPMENT (NOT SHOWN)
FANS & BLOWERS
PUMPS
MISCELLANEOUS
CHEVRON PRODUCTS COMPANY
HYDROGEN PLANT
PLOT PLAN
ENVIRONMENTAL AUDIT, INC.
Figure 5
Project No. 2184
N:\2184\Hydrogen Plot Plan

prereformer to initiate the reforming process prior to the gas going to the main reformer tubes.

Desulfurized ammonia will be mixed with the prereformer outlet stream and sent to the main reformer tubes.

The prereformer contains tubes that are filled with a nickel-based reforming catalyst. The feed gas will be converted to a mixture of hydrogen, methane and carbon oxides over this catalyst. The process gas flows downward with the gas entering the top of the vertically mounted tubes. The reformer product exits through the bottom of the catalyst tubes. Flue gas flow is upward with an outlet near the top of the radiant chamber.

The heat of reaction will be supplied by burners, arranged in rows on each side of the furnace, to provide control of a uniform temperature profile along the length of the catalyst tubes. An on-line oxygen analyzer in the flue gas ductwork will be used to control excess combustion air. Fans will provide the required draft to evacuate the combustion flue gases and to provide combustion air to the burners.

The majority of the heat requirement will be satisfied by combustion of off gas from the PSA unit. The balance of the heat requirement for the reformer will be made up by firing refinery fuel gas or natural gas as trim fuels.

The flue gas collector passes the flue gas from the radiant chamber to the waste heat recovery section where the heat of the flue gas is used to: (1) preheat pre-reformer and reformer feed gases; (2) superheat steam; (3) heat the waste heat boiler coil; (4) preheat boiler feed water; and (5) preheat combustion air. Maximum heat recovery will be achieved from both the reformer process gas and the reformer flue gas.

The reformer process gas will be cooled by generating steam in the waste heat boiler, producing saturated steam. The incoming boiler feed water is also preheated by the reformer process gas.

The reformer flue gas will be routed to a Selective Catalyst Reduction (SCR) Unit, which is an air pollution control device. The SCR Unit reduces NOx emissions in the flue gas by injecting ammonia, which reacts with NOx. Aqueous ammonia will be vaporized and mixed with air, preheated, and injected into the reformer flue gas, directly upstream of the SCR catalyst. In the presence of the SCR catalyst, the NOx reacts with the ammonia to form nitrogen and water. The appropriate amount of ammonia will be added to reduce the NOx to the desired concentration.

Aqueous ammonia from an existing on-site storage tank will be fed to an ammonia feed pump and through a filter, prior to being combined with recycled flue gas. Air and heated air are introduced into the system from the instrument air header and ammonia injection blower, respectively. The ammonia/air mixture exiting the ammonia mixer

passes through a static mixer and will then be sprayed into the flue gas stream through the ammonia injection grid.

Medium Temperature Shift Conversion

Carbon monoxide in the reformer process gas will be converted in the presence of steam (water) to carbon dioxide and additional hydrogen in the medium temperature shift reactor. Adjustment of the medium temperature shift reactor inlet temperature will be necessary because the shift reaction equilibrium is favored by low temperature, while catalyst activity will be increased by higher temperature. Thus, an optimum temperature will be selected. As the shift catalyst ages, the inlet temperature will be raised to maintain activity. The medium temperature shift reactor effluent will be cooled, waste heat recovered, and boiler feed water preheated in a series of steps before it is fed to the PSA unit.

Purification of the Process Gas by Pressure Swing Adsorption (PSA) Unit

After the process gas exiting the medium temperature shift reactor has been cooled, the remaining hydrogen-rich process gas will be sent to the multi-bed PSA Unit for hydrogen purification. The hydrogen produced by the PSA unit will have a minimum purity of 99 mole percent. The PSA unit consists of: vertical adsorber vessels which will contain adsorbent; vertical PSA off gas surge tank; and valve skids which will include manual valves, switch valves, control valves, instrumentation, relief valves, silencers, and interconnecting piping.

Each adsorption vessel in the PSA unit follows a cycle of adsorption, stepwise depressuring, purging, and stepwise re-pressuring. The system maximizes hydrogen recovery by effectively utilizing the residual hydrogen in an adsorber vessel at the end of its cycle to re-pressure the other vessels and provide hydrogen for purging. Product hydrogen from the PSA unit will be compressed in a hydrogen compressor.

The purge gas (offgas) from the purging (regeneration) process will be collected. This PSA off gas will be composed of the hydrogen purge and desorbed impurities (i.e., carbon dioxide, methane, carbon monoxide, nitrogen, and water vapor). From the surge tank, the off gas will be sent to the reformer furnace burners as fuel.

Product Compression

A compressor will be used to compress the hydrogen product for delivery to the various Refinery units. Two compressors will be installed, but only one will be in operation at a time.

Waste Heat Recovery/Steam Generation

The reformed process gas will be cooled by generating saturated steam in the process boiler. The gas will then enter the medium temperature shift converter where the gas temperature is raised. The gas then passes through a series of preheaters, and process condensate separators where additional hydrogen will be recovered.

Boiler feed water from the degasifier is pumped, preheated, and routed to the steam drum. The treated water from the steam drums will be used for the production of steam in two boilers.

Process condensate will be routed from two process condensate separators to a separate process condensate stripper where dissolved gases, methanol and ammonia, will be removed. Stripped condensate is cooled and sent to the degasifier. The gas leaving the final process condensate separator (with a hydrogen content of about 70 mole percent) is routed to the PSA unit for purification. The stripper overhead is recycled back to the process gas upstream of the reformer.

All new and modified process components are required to comply with the SCAQMD's Regulation XIII requirement to install Best Available Control Technology (BACT) in conformance with the BACT Guidelines. BACT will be required to control stationary source emissions for all criteria pollutants (nitrogen oxides, sulfur oxides, carbon monoxide, particulate matter and VOC emissions).

Miscellaneous Project Issues

The proposed project is expected to require nine additional permanent workers at the Refinery. No increase in truck traffic is expected on a routine basis. The Refinery and all related equipment will continue to operate up to 24 hours per day for 365 days per year.

Construction Activities

Construction of the Hydrogen Plant will use construction equipment including forklifts, cranes, dozers, air compressors, welding machines, etc. Process equipment will be brought to the site and installed. Most system equipment will be built off-site and transported on-site for assembly into the final facility arrangement.

Construction is scheduled to begin when all permits and approvals are obtained (estimated to be third quarter of 2003). Construction activities are expected to last about 12 months. Current plans are to work five days per week, Monday through Friday from 7:00 a.m. to 5:00 p.m., with possible overtime or work on weekends, as the construction schedule may require and local ordinances will allow. The maximum number of daily workers used during the construction of the facility is estimated to be 213. Parking will be provided for construction workers at several locations within the existing Chevron Refinery.

Other Permits and Approvals

The proposed Hydrogen Plant will require building permits (including grading, fire, electrical and mechanical permits) from the City of El Segundo.

CHAPTER 2

ENVIRONMENTAL CHECKLIST FORM

INTRODUCTION

The environmental checklist provides a standard evaluation tool to identify a project's adverse environmental impacts. This checklist identifies and evaluates potential adverse environmental impacts that may be created by the proposed project.

GENERAL INFORMATION

Project Title:	Proposed Hydrogen Plant
Lead Agency Name:	South Coast Air Quality Management District
Lead Agency Address:	21865 E. Copley Drive Diamond Bar, CA 91765
Contact Person:	Michael Krause
Contact Phone Number:	(909) 396-2706
Project Sponsor's Name:	Chevron Products Company
Project Sponsor's Address:	324 West El Segundo Boulevard El Segundo, CA 90245
General Plan Designation:	Refinery – Heavy Industrial
Zoning:	Refinery – M-2 Heavy Industrial
Description of Project:	A new hydrogen production plant at the existing Chevron El Segundo Refinery will be constructed to replace the existing hydrogen plant in order to meet emission limits on VOC. An existing hydrogen plant will be shut down.
Surrounding Land Uses and Setting:	The Refinery is located in an industrialized area of Los Angeles County. See Section 1.1 Introduction.
Other Public Agencies Whose Approval is Required:	City of El Segundo

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The following environmental impact areas have been assessed to determine their potential to be affected by the proposed project. As indicated by the checklist on the following pages, environmental topics marked with an "√" may be adversely affected by the proposed project. An explanation relative to the determination of impacts can be found following the checklist for each area.

☐ Aesthetics	☐ Agriculture Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Energy
☐ Geology/Soils	☐ Hazards & Hazardous Materials	☐ Hydrology/ Water Quality
☐ Land Use/Planning	☐ Mineral Resources	☐ Noise
☐ Population/Housing	☐ Public Services	☐ Recreation
☐ Solid/Hazardous Waste	☐ Transportation/ Traffic	☐ Mandatory Findings of Significance

DETERMINATION

On the basis of this initial evaluation:

☑ I find the proposed project COULD NOT have a significant effect on the environment, and that a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be significant effects in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect(s) on the environment, and an ENVIRONMENTAL IMPACT REPORT (EIR)is required.

☐ I find that the proposed project MAY have a "potentially significant impact" on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Date: May 22, 2003 Signature: Steve Smith

Steve Smith, Ph.D.
Program Supervisor

ENVIRONMENTAL CHECKLIST AND DISCUSSION

	Potentially Significant Impact	Less Than Significant Impact	No Impact
1.0 AESTHETICS. Would the project:			
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☑
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☑
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☑	☐
d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☑	☐

1.1 Significance Criteria

The proposed project impacts on aesthetics will be considered significant if:

The project will block views from the scenic highway or corridor.

The project will adversely affect the visual continuity of the surrounding area.

The impacts on light and glare will be considered significant if the project adds lighting which would add glare to residential areas or sensitive receptors

1.2. Environmental Setting and Impacts

1. a, b, and c) The Chevron Products Company Refinery is located in an area of mixed uses with industrial, recreation, residential, and commercial uses nearby. The predominant adjacent land uses include: Dockweiler State Beach, Manhattan Beach and the El Segundo Generating Station to the west; a residential area of Manhattan Beach to the south; a golf course, a commercial and light industrial corridor to the east; and commercial and residential areas of El Segundo to the north. The construction of the Hydrogen Plant is not expected to negatively affect visual resources since it is located entirely within the boundaries of the existing Refinery.

The project modifications include the dismantling of an existing Hydrogen Plant and the construction of the new Hydrogen Plant near the location of the existing Plant (see Figure 3). The views of the Refinery from adjacent properties are not expected to significantly change because of the proposed project. The new Hydrogen Plant will have similar structures, vessels, and stacks as the existing Hydrogen Plant so that a significant change in the visual characteristics of the Refinery is not expected. All structures (e.g. stacks, vessels) in the new Hydrogen Plant are not expected be taller than those in the existing Refinery. The existing Refinery boundaries are extensively landscaped with trees and shrubs, which help to block the view of the existing and on-site facilities. Portions of the Refinery are further screened by topography, including the southern portion of the Refinery, near the location of the proposed Hydrogen Plant, which blocks views of the existing Refinery.

Based on the changes that would occur at the existing Refinery, (the addition of structures similar to those already located at the site, and the removal of certain existing Refinery structures), the project is not expected to result in a significant impact to visual resources.

1. d) Construction activities are not anticipated to require additional lighting because they are scheduled to take place during daylight hours. However, if the construction schedule requires nighttime activities, temporary lighting may be required. Since the project location is completely located within the boundaries of the existing Chevron Products Company Refinery, additional temporary lighting is not expected to be discernible from the existing permanent lighting.

Additional permanent light sources will be installed on the new equipment to provide illumination for operations personnel at night. These additional light sources are not expected to create an impact because the project components will be located within existing industrial facilities, which are already lighted at night for nighttime operations. Furthermore, the project will remove existing light sources associated with the existing Hydrogen Plant, so that no overall increase in lighting associated with the Refinery is expected. Therefore, no significant impacts to light and glare are anticipated from the proposed project.

1.3 Mitigation Measures

No significant adverse impacts to aesthetics are expected to occur as a result of construction or operation of the proposed project. Therefore, no mitigation is necessary or proposed.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
2.0	**AGRICULTURE RESOURCES**. Would the project:			
a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☑
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☑
c)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☑

2.1 Significance Criteria

Project-related impacts on agricultural resources will be considered significant if any of the following conditions are met:

The proposed project conflicts with existing zoning or agricultural use or Williamson Act contracts.

The proposed project will convert prime farmland, unique farmland or farmland of statewide importance as shown on the maps prepared pursuant to the farmland mapping and monitoring program of the California Resources Agency, to non-agricultural use.

The proposed project will involve changes in the existing environment, which due to their location or nature, could result in conversion of farmland to non-agricultural uses.

2.2 Environmental Setting and Impacts

2. a, b, and c) The proposed project includes improvements and modifications at existing industrial facilities. No agricultural resources are present at or in the vicinity of the Refinery. Therefore, the proposed project would not convert farmland (as defined in 2.a above) to non-agricultural use or involve other changes in the existing environment that could convert farmland to non-agricultural use or conflict with agricultural land uses.

2.3 Mitigation Measures

No significant adverse impacts to agricultural resources are expected to occur as a result of construction or operation of the proposed project. Therefore, no mitigation is necessary or proposed.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
3.0 AIR QUALITY. Would the project:			
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☑
b) Violate any air quality standard or contribute to an existing or projected air quality violation?	☐	☑	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☑	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☑	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☑	☐

f) Diminish an existing air quality rule or future compliance requirement resulting in a significant increase in air pollutant(s)?	☐	☐	☑

3.1 Significance Criteria

Impacts will be evaluated and compared to the significance criteria in Table 1. If impacts equal or exceed any of the following criteria, they will be considered significant.

TABLE 1

AIR QUALITY SIGNIFICANCE THRESHOLDS

Mass Daily Thresholds		
Pollutant	**Construction**	**Operation**
NOx	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
TAC, AHM, and Odor Thresholds		
Toxic Air Contaminants (TACs)	Maximum Incremental Cancer Risk $\geq$ 10 in 1 million Hazard Index $\geq$ 1.0 (project increment) Hazard Index $\geq$ 3.0 (facility-wide)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
Ambient Air Quality for Criteria Pollutants		
NO_2 1-hour average annual average	 20 ug/m^3 (= 1.0 pphm) 1 ug/m^3 (= 0.05 pphm)	
PM10 24-hour annual geometric mean	 2.5 ug/m^3 1.0 ug/m^3	
Sulfate 24-hour average	 1 ug/m^3	
CO (Carbon Monoxide) 1-hour average 8-hour average	 1.1 mg/m^3 (= 1.0 ppm) 0.50 mg/m^3 (= 0.45 ppm)	

PM10 = particulate matter less than 10 microns in size, ug/m3 = microgram per cubic meter; pphm = parts per hundred million; mg/m3 = milligram per cubic meter; ppm = parts per million; TAC = toxic air contaminant; AHM = Acutely Hazardous Material

3.2 Environmental Setting and Impacts

3. a) An inventory of existing emissions from the industrial facilities is included in the baseline inventory in the Air Quality Management Plan (AQMP). The AQMP identifies emission reductions from existing sources and air pollution control measures that are necessary in order to comply with the state and federal ambient air quality standards (SCAQMD, 1993). The control strategies in the AQMP are based on projections from the local general plans provided by the cities in the District (including the City of El Segundo). Projects that are consistent with the local General Plans are consistent with the air quality related regional plans. The proposed project is considered to be consistent with the air quality related regional plans since it is consistent with the City of El Segundo's General Plan.

The 1997 AQMP and the 1999 amendments to the AQMP demonstrate that applicable ambient air quality standards can be achieved within the timeframes required under federal law. This project must comply with applicable SCAQMD requirements and control measures for new or modified sources. It must also comply with prohibitory rules, such as Rule 403, for the control of fugitive dust. By meeting these requirements, the project will be consistent with the goals and objectives of the AQMP.
New emission sources associated with the proposed project are required to comply with the SCAQMD's Regulation XIII - New Source Review requirements that include the use of BACT. Further, the proposed project is required to comply with the SCAQMD Rule 1189, that limits the total VOC emissions from all process vents at hydrogen plants to less than 2.5 pounds of VOC per million standard cubic feet of hydrogen. After review of various options available to achieve compliance with SCAQMD Rule 1189, Chevron determined that the most efficient and effective way to comply was to build a new Hydrogen Plant and demolish the existing SMR Hydrogen Plant.

3. b), c), and f) Emissions Estimates

Construction Emissions: Construction activities associated with the proposed project would result in emissions of CO, PM10, VOCs, NO_X and SOx. Construction activities include construction of new foundations, and installation of the new equipment. The site is already graded, so no major grading activities are expected.

Daily construction emissions were calculated for the peak construction day activities based on activities at the Refinery. Peak day emissions are the sum of the highest daily emissions from employee vehicles, fugitive dust sources, construction equipment, and transport activities at all affected facilities for the construction period. The peak construction emissions were calculated by peak day in each month of the project schedule (see Appendix A). The peak day is based on the day in which the highest emissions occur for each pollutant. The peak day varies by pollutant, e.g., the peak day for CO emissions is expected to occur in Month seven and the peak day for NOx emissions is expected to occur during Month five of the construction period. The peak day was picked for each pollutant. The criteria pollutant emissions for that peak day were then compared to their respective significance thresholds. Peak construction emissions for the proposed project are summarized in Table 2. Detailed construction emissions calculations for the proposed project are provided in Appendix A.

TABLE 2

PEAK CONSTRUCTION EMISSIONS

Activity/Source	Peak Daily Emissions (lbs/day)				
	CO	PM10	VOC	NO_X	SO_X
On-Site Heavy Equipment	37.5	34.4	7.0	86.0	0.6
On-Site Motor Vehicles	3.5	1.6	0.4	2.6	0
On-Site Other Fugutive PM10	0	0.2	0	0	0
On-Site Architectural Coating	0	0	11.7	0	0
On-Site Subtotal	**41.0**	**36.2**	**19.1**	**88.6**	**0.6**
Off-Site Motor Vehicles	140.3	2.8	13.4	10.8	6.0
Off-Site Subtotal	**140.3**	**2.8**	**13.4**	**10.8**	**6.0**
Total	**181.3**	**39.0**	**32.5**	**99.4**	**6.6**
SCAQMD Threshold	*550*	*150*	*75*	*100*	*150*
Threshold Exceeded (Yes/No)	NO	NO	NO	NO	NO

Notes: "On-Site Other Fugitive PM10" includes fugitive PM10 from storage pile wind erosion.
SCAQMD Threshold = threshold criteria for determining environmental significance of construction activities, as provided in the South Coast Air Quality Management District's 1993 Handbook for Air Quality Analysis.

The existing SMR hydrogen plant will be demolished after the completion of the new Hydrogen Plant. Emissions related to demolition would not occur during the peak construction period since demolition would occur after completion of all construction activities and about six months after the start up of the new Hydrogen Plant. Demolition activities would only involve a few workers and several pieces of heavy equipment, so that emissions during demolition activities are expected to be much less than the emissions during the construction phase of the Hydrogen Plant.

The proposed project emissions during the construction phase are compared to the SCAQMD CEQA thresholds in Table 2. The peak construction emissions are expected to be less than the SCAQMD CEQA thresholds so that no significant impacts on air quality are expected during the construction phase.

Operational Emissions

The proposed project is expected to result in an overall decrease in emissions associated with the operation of the new Hydrogen Plant. An older Steam Methane Reforming Hydrogen Plant will be replaced with a new Hydrogen Plant that will comply with the current BACT requirements. BACT for the new Hydrogen Plant reformer furnace is expected to be 10 parts per million by volume (ppmv) for CO and five ppmv for ammonia (at three percent oxygen). CO and ammonia emissions will be guaranteed by vendors. NOx emissions will be controlled using Selective Catalytic Reduction technology and will be limited to about five ppmv or less, depending upon federal Lowest Achievable Emission Rates (LAER) at the time permits are approved. BACT for PM10 and VOC emissions will be achieved from good combustion practices in the reformer.

Table 3 compares the estimated emission reductions resulting from replacing the existing Hydrogen Plant with the proposed new Hydrogen Plant. Operations of the new Hydrogen Plant can use and propose to use a variety of feedstocks (natural gas, refinery fuel gas, pentanes, and ammonia) and its reformer furnace can use, and the proposal includes using, different fuels (natural gas, refinery fuel gas and PSA off-gas). The "worst-case" emissions are from the combustion of refinery fuel gas, which the emissions estimates are based on. Emissions from the existing hydrogen plant were based on the average of the two-year actual emissions.

In order to estimate proposed plant fugitive emissions, conservative assumptions were employed. Thus the decrease in emissions is expected to be greater by replacing the existing plant with the proposed plant. In the absence of actual data, the emission factor was assumed to be the maximum allowed under Rule 1189 for existing plant process vents (2.5 lbs/mmscf of hydrogen production). Similarly, for the proposed plant, Rule 1189 requires all process vent emissions from new or reconstructed hydrogen plants to emit less than 0.5 lb/mmscf of VOC emissons (45 lb/day of VOC). However, estimated VOC emissions for the proposed plant process vents are expected to be less than 0.005 lb/mmscf or about 0.46 lb/day.

Based on Table 3, the emissions from the new Hydrogen Plant will be much less than the emissions from the existing Hydrogen Plant. Therefore, operation of the new Hydrogen Plant will result in an emission benefit compared to the existing setting. No increases in emissions are expected and no significant adverse impacts are expected.

TABLE 3

OPERATIONAL EMISSIONS INCREASES AND DECREASES

	Emissions (lbs/day, 24 hr/day)				
	CO	PM10	VOC	NO_X	SO_X
New Equipment					
Reformer	128.1	121.4	113.4	125.3	33.6
Fugitives	-	-	52.4	-	-
Process Vents	-	-	0.46	-	-
Total	**128.1**	**121.4**	**166.3**	**125.3**	**33.6**
Existing Equipment					
Reformer	132.5	121.5	113.4	1,624.5	109.5
Fugitives	-	-	163.0	-	-
Process Vents	-	-	180.0	-	-
Total	**132.5**	**121.5**	**456.4**	**1,624.5**	**109.5**
Emission Reductions					
Reformer	-4.4	-0.1	0.0	-1,499.2	-75.9
Fugitives	-	-	-110.6	-	-
Process Vents	-	-	-179.5	-	-
Total	**-4.4**	**-0.1**	**-290.1**	**-1,499.2**	**-75.9**
AQMD Threshold	550	150	55	55	150
Significant?	NO	NO	NO	NO	NO

Impacts to Ambient Air Quality

To calculate air concentrations of criteria pollutants, air dispersion modeling was completed using the SCREEN3 model with "worst-case" meteorological conditions. The total emission increases of NOx, CO, and PM10 from new stationary sources only were modeled (i.e., the total emission increases and not the difference in emissions between the existing and proposed hydrogen plants). The SCREEN3 model is considered appropriate for air quality modeling purposes and provides conservative results since it uses "worst-case" meteorological data (CAPCOA Guidelines, 1993). Use of other more complex models such as the Industrial Source Complex (ISC3) model would result in more refined and possibly lower concentrations. The emission calculations and modeling results are provided in Appendix *B*. The total concentration, obtained as the sum of modeled concentration and background concentration for each criteria pollutant, was compared to the California Ambient Air Quality Standards (CAAQS) and the National Ambient Air Quality Standards (NAAQS) to determine the potential for impacts. The model-predicted impacts on ambient air concentrations of NOx, CO, and PM10 are below the significance change threshold for all pollutants. Therefore, there was no need to use the more refined models, e.g., ISC3 model. The project emissions would not exceed the significant change thresholds for CO, NOx or PM10 (see Appendix *A*). Therefore, no significant impacts on ambient concentrations of CO, NOx and PM10 are expected.

Toxic Air Contaminants Construction Impacts

The proposed project would generate emissions from construction equipment during construction activities, including emissions from diesel trucks and heavy construction equipment. CARB classifies diesel particulate emissions as a TAC. Significant impacts associated with exposure to diesel particulate emissions are not expected because construction is estimated to last approximately five days per week, for about a 12 month period and exposures will occur during the construction period. Quantitative cancer risk analyses are based on exposure of 70 years for residential exposures and 46 years for occupational exposures; exposure to project-related emissions would be for a much shorter period of time (i.e. during the construction phase). The maximum particulate emission for diesel engines is about 4.6 pounds per day during peak construction phase. Based on the short exposure period and small amount of emissions, toxic air contaminant emissions are expected to be less than significant during the construction phase.

Toxic Air Contaminants Operational Impacts

A Tier 3 Health Risk Assessment (HRA) was completed using SCAQMD default emission factors for natural gas combustion in heaters (> 100 MMBtu/hr). The exception is ammonia assuming a nine ppm slip from the SCR unit. TAC emissions from the Reformer were included in the analysis. Annual average emissions were calculated for the cancer risk and chronic non-cancer risk analyses. The Reformer is assumed to operate 24 hours per day, 365 days per year. The SCREEN 3 model was used to determine the ground level concentrations of TACs.

Maximum cancer risk for each compound was calculated using the annual average concentration multiplied by a cancer inhalation unit risk factor and a multi-pathway factor**.**

Chronic and acute noncancer Hazard Indices for each applicable compound were calculated using the maximum one-hour average concentration multiplied by the multi-pathway factor (chronic and acute) divided by the Reference Exposure Level. Total cancer risks and noncancer Hazard Indices were calculated by adding the cancer risks or noncancer Hazard Indices from each compound.

The maximum cancer risk and chronic Hazard Index (HI) occurred at a residential location, 440 meters south of the proposed plant (see Table 4). The maximum acute Hazard Index occurred at an offsite location, 400 meters south of the proposed plant (see Table 4 for results of that analysis). Maximum cancer and noncancer risks are below the SCAQMD CEQA thresholds therefore no significant impacts are expected. The analysis is conservative since no credit was taken for reduction in off-site health risks impacts from the shutdown of the existing SMR Reformer. All analytical results are listed in Table 4, which include emissions from the new Hydrogen Plant (including the new Reformer Heater), in addition to fugitive emissions. Detailed information is presented in Appendix *B*.

TABLE 4

MAXIMUM INCREMENTAL CANCER RISK, AND CHRONIC AND ACUTE HEALTH INDICES FOR RESIDENTS AND WORKERS

Substance	Resident MICR	Worker MICR	Total CHI	Acute Exposure Total AHI
Acetaldehyde	6.6E-11	6.3E-12	2.73E-06	
Acrolein			3.64E-04	1.60E-03
Propylene			1.41E-07	
Xylene			2.26E-07	1.00E-07
Benzene	1.3E-09	1.3E-10	7.74E-07	4.97E-07
Ethyl Benzene			2.73E-08	
Formaldehyde	5.9E-10	5.6E-11	3.28E-05	1.45E-05
Hexane			5.07E-09	
Napthalene			9.10E-07	
Toluene			7.1.0E-07	8.00E-08
PAH (non-naphthalene)	3.8E-08	3.6E-09		
Ammonia			6.98E-04	6.07E-04
SUM	**4.0E-08**	**3.8E-09**	**0.001**	**0.002**
Significance Threshold	1.0E-06	1.0E-06	1.0	1.0
Exceed Thresholds?	NO	NO	NO	NO

CHI = Chronic Hazard Index
MICR = Maximum Incremental Cancer Risk
AHI = Acute Hazard Index
PAH = Polynuclear Aromatic Hydrocarbon

HRA Conclusions

No significant impacts on toxic air contaminants are expected from the proposed project. The maximum increase in cancer risk is below the 10×10^{-6} (ten per million) cancer risk significance threshold. Chronic and acute hazard indices for residents and workers are below the SCAQMD's significance threshold of 1.0 established for non-cancer risk. Therefore, the SCAQMD cancer risk and hazard index thresholds are not expected to be exceeded at any receptor location, and no significant impacts associated with toxic air contaminants are expected.

3. e) Fugitive emissions or leaks from project equipment could result in potential odor impacts. Fugitive emission components are under the purview of formal regulatory inspection and maintenance programs required under federal New Source Performance Standards and SCAQMD Rule 1173. These programs ensure correction of conditions that may cause odor events. The Refinery maintains a 24-hour environmental surveillance effort. This activity also

has the effect of minimizing the frequency and magnitude of odor events. The fuels and materials proposed to be used in the Hydrogen Plant are generally not sources of odors. No odors have been associated with the existing hydrogen plant and no odors are expected from the new Hydrogen Plant since the materials used and produced in the Hydrogen Plant (e.g., natural gas, refinery fuel gas, hydrogen, PSA off-gas, etc.) do not usually generate odors. The use of BACT (e.g., leakless valves) also reduces the emissions of compounds that could produce odor impacts. Potential odor impacts from the proposed project are not expected to be significant.

3.3 Mitigation Measures

No mitigation measures are required for the proposed project since no significant impacts to air quality are expected.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
4.0.	**BIOLOGICAL RESOURCES.** Would the project:			
a)	Have substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☑
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☑
c)	Have a substantial adverse effect on federally protected wetlands as defined by §404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☑
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☑

e)	Conflicting with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☑
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☑

4.1 Significance Criteria

The impacts on biological resources will be considered significant if any of the following criteria apply:

The project results in a loss of plant communities or animal habitat considered to be rare, threatened or endangered by federal, state or local agencies.

The project interferes substantially with the movement of any resident or migratory wildlife species.

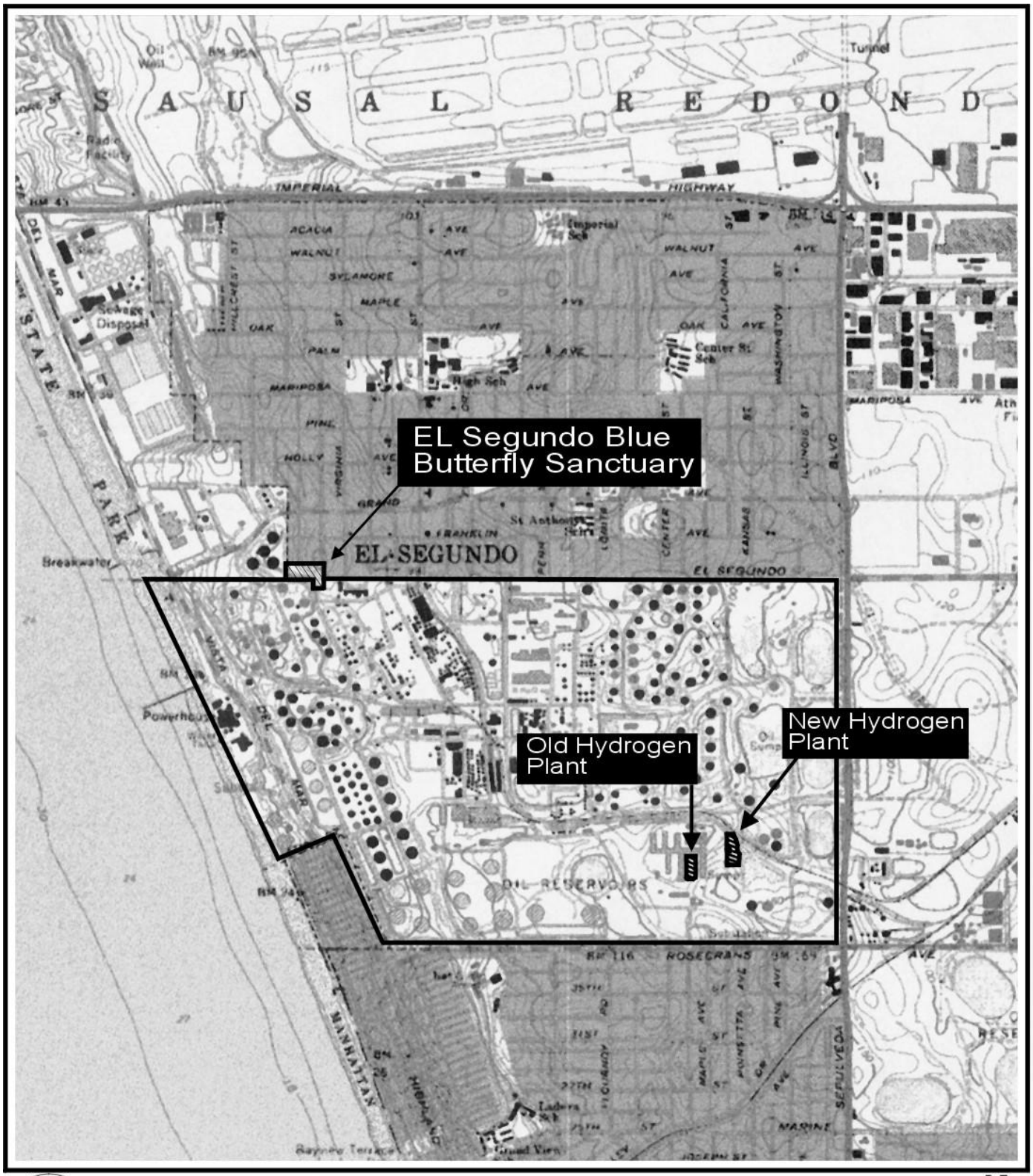
The project adversely affects aquatic communities through construction or operation of the project.

4.1 Environmental Setting and Impacts

4. a), b), c), d), and f) The proposed project would be located within existing boundaries of the Refinery, which have already been developed. These areas contain industrial activities and do not support riparian habitat, federally protected wetlands, or migratory corridors. Based on a review of California Natural Diversity Data Base maps for the project areas, there are three sensitive, threatened, or endangered species in the immediate vicinity of the Refinery. (SCAQMD, 2001).

El Segundo Blue Butterfly

The El Segundo Blue Butterfly has been listed by the Fish and Wildlife Service of the U.S. Department of the Interior as an endangered species. Population occurrences of the El Segundo blue butterfly are believed to be limited to three areas: (1) the butterfly sanctuary at the Refinery; (2) sand dunes located at the western boundary of the Los Angeles International Airport; and (3) an area in Malaga Cove on the Palos Verdes Peninsula. The butterfly sanctuary at the Refinery (Figure 6) is approximately 1.0-1.5 miles from the proposed project modifications at the Refinery. Direct physical environmental impacts, such as changes in water quality, are not expected because construction would occur within the existing Refinery on previously graded land approximately 1.5 mile away from the butterfly sanctuary. Indirect impacts, such as changes to ambient noise or lighting, are not expected due to the distance



El Segundo Blue Butterfly Sanctuary
Chevron Texaco Refinery

Figure 6

Project No. 2184

N:\2184\El Segundo Butterfly. Sanctuary .CDR

between the butterfly sanctuary and the proposed construction areas and the large amounts of noise and light which are already present in the area.

Pacific Pocket Mouse

The Pacific pocket mouse inhabits coastal strand, coastal dunes, river alluvium, and coastal sage scrub on marine terraces. Historically, the Pacific pocket mouse inhabited areas of the Refinery property, but it has not been sighted since 1938. Due to the disturbed nature of the Refinery property and the fact that the Pacific pocket mouse has not been seen in over 60 years, this species is not expected to exist at the Refinery property and therefore would not be adversely impacted by the proposed activities.

Beach Spectaclepod

The beach spectaclepod is a California native plant that occurs in foredunes, active sand and dune scrub. The historic range for this species includes portions of the Refinery property, although the last sighting was in 1884, according to a 1979 report. Due to the disturbed nature of the Refinery property and the fact that the beach spectaclepod has not been sighted since 1884, this species is not expected to occur on the Refinery property and therefore would not be adversely impacted by the proposed activities.**Mitigation Measures**

No significant impacts to biological resources are expected to occur as a result of construction or operation of the proposed project. Therefore, no biological mitigation is necessary or proposed.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
5.0	**CULTURAL RESOURCES.** Would the project:			
a)	Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☑
b)	Cause a substantial adverse change in the significance of an archaeological resource as defined in §15064.5?	☐	☐	☑
c)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☑

d)	Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☑

5.1 Significant Criteria

Impacts to cultural resources will be considered significant if:

The project results in the disturbance of a significant, prehistoric, or historic archaeological site or a property of historic significance to a community or ethnic or social group.

Unique paleontological resources are present that could be disturbed by construction of the proposed project.

The project would disturb human remains.

5.2 Environmental Setting and Impacts

5. a), b), c), and d) The proposed project will result in ground-disturbing activities, but no significant adverse impacts to equipment and structures over 50 years of age, which may be culturally significant, are anticipated to occur.

Three archaeological studies have been conducted within a ¼-mile radius of the Refinery. Of these, one was completed within the Refinery boundaries, along the railroad tracks that run in an east-west direction through the central portion of the Refinery property (Peak and Associates, 1992). No archeological sites were found during the study of the railroad tracks at the Refinery.

A search of the California State Historic Resources Inventory, National Register of Historic Places, California Points of Historical Interest (1992) and the City of Los Angeles Historic Cultural Monuments was conducted. The results did not indicate any sites of cultural or historical significance within the Refinery boundaries.

5.3 Mitigation Measures

The impacts of the proposed project on cultural resources are less than significant so that no mitigation measures are expected.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
6.0	**ENERGY.** Would the project:			
a)	Conflict with adopted energy conservation plans?	☐	☐	☑
b)	Result in the need for new or substantially altered power or natural gas utility systems?	☐	☐	☑
c)	Create any significant effects on local or regional energy supplies and on requirements for additional energy?	☐	☐	☑
d)	Create any significant effects on peak and base period demands for electricity and other forms of energy?	☐	☐	☑
e)	Comply with existing energy standards?	☐	☐	☑

6.1 Significance Criteria

The impacts to energy and mineral resources will be considered significant if any of the following criteria are met:

The project conflicts with adopted energy conservation plans or standards.

The project results in substantial depletion of existing energy resource supplies.

An increase in demand for utilities impacts the current capacities of the electric and natural gas utilities.

6.2 Environmental Setting and Impacts

6. a) The proposed project is not expected to conflict with an adopted energy conservation plan because there is no known energy conservation plan that would apply to this proposed project and because the proposed project is not expected to significantly increase the Refinery's energy demand. The proposed project will generate additional steam and hydrogen for use by the Refinery and potentially other users in southern California.

6. b), c), d), and e). The Chevron El Segundo Refinery is currently served by Southern California Edison (SCE) for electricity supply. An existing cogeneration plant at the Refinery also supplies electricity to the Refinery. No significant increase in the use of electricity at the Refinery is expected during the construction period since most of the equipment used will be powered by gasoline and diesel fuel. Electricity will be needed for lighting and welding which is

expected to be a minor increase. Electricity demand during construction will be for the 12-month construction period, which represents a small percentage of the overall projected usage for the Los Angeles area. The projected electricity demand for Los Angeles County in 2003 is estimated to be 65,000 megawatts (MW) (CEC, 2003).

The existing hydrogen plant currently consumes about two megawatts (MW) of electricity and the new Hydrogen Plant is designed to consume about 9.3 MW. Therefore, the proposed project will result in an overall increased demand for electricity of about 7.3 MW. This increase in electricity demand is negligible compared to the current electrical demand of 65,000 MW in Los Angeles County (0.01 percent increase). The existing electrical demand is currently met by a number of existing electrical generating plants in the southern California area. The California Energy Commission (CEC) believes that sufficient electricity capacity is currently available. Since 2000, 18 new power plants have been licensed and constructed adding over 4,980 MW to the electricity grid. By August 2003, seven additional power plants generating 3,106 MW will come online. Also, 25 renewable energy power plants, adding nearly 110 MW, have been funded through the CEC's New Renewable Account, with an additional 12 MW coming online before August 2003. Electricity is supplied and will continue to be supplied by the Refinery's existing cogeneration plant and SCE. Therefore, no significant impacts on electricity are expected during the operation of the proposed project.

The proposed new Hydrogen Plant will use natural gas, refinery fuel gas, and PSA off-gas, as fuel to the new Hydrogen Plant. Pentanes, ammonia, natural gas and refinery fuel gas will be used as process feeds to the Plant. Refinery fuel gas, pentanes, and ammonia are all produced within the Refinery. The existing hydrogen plant currently uses primarily refinery fuel gas (which can be supplemented with natural gas, if needed). The new Hydrogen Plant is expected to use PSA off-gas and refinery fuel gas as its primary fuel. The existing reformer heater is 780 mmBtu/hr and the proposed new reformer heater is also 780 mmBtu/hr so the new Hydrogen Plant will not require additional fuel gas than the existing hydrogen plant. Further, the new reformer heater is expected to use other fuel sources including pentanes and ammonia which would further offset the need for refinery fuel and natural gas. Therefore, the new heater will not require additional fuel supplies than the existing heater and the proposed project is not expected to result in an increase in the purchases of natural gas during routine operations.

Southern California Gas Company supplies natural gas to the Refinery. The operation of the proposed plant will require natural gas on a periodic basis. The operation of the new Hydrogen Plant is not expected to result in an increase in natural gas since the old Hydrogen Plant will be removed from service and the new Hydrogen Plant will use approximately the same amount of natural gas as the existing plant. Therefore, no significant impacts on natural gas usage are expected during the operation of the proposed project.

The California Energy Commission (1998) used industrial production and employment to determine industrial electricity and natural gas consumption in its forecasts. A variety of physical production indices and value of shipments were used to ascertain that overall industrial energy efficiency is expected to increase from past levels by about one percent per year or slightly less. California's process industry, which includes petroleum refining, is expected to grow at 1.3 percent per year. Electricity consumption in the petroleum refining industry in California was

8,063 GWh in 2002. This is expected to increase to 9,021 GWh in 2007, representing an annual change of 1.5 percent. Natural gas consumption in the petroleum refining industry was 2,105 GWh in 2002 and is expected to decrease to 1,998 GWh by 2007. This represents a decrease in the natural gas consumption of 0.8 percent.

Future energy consumption is dependent on rates, promotion of energy efficiency, use of alternative energy sources and the actions of the Energy Service Providers who contract with customers to provide energy sources. Overall, ongoing restructuring in the electricity and natural gas markets have added to the level of uncertainty in forecasting energy usage.

6.3 Mitigation Measures

The impacts of the proposed project on energy resources are less than significant so that no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
7.0 GEOLOGY AND SOILS. Would the project:			
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☑
• Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?	☐	☐	☑
• Strong seismic ground shaking?	☐	☑	☐
• Seismic–related ground failure, including liquefaction?	☐	☑	☐
• Landslides?	☐	☐	☑
b) Result in substantial soil erosion or the loss of topsoil?	☐	☑	☐
c) Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☑
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☑

e)	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☑

7.1 Significance Criteria

The impacts on the geological environment will be considered significant if any of the following criteria apply:

Topographic alterations would result in significant changes, disruptions, displacement, excavation, compaction or over-covering of large amounts of soil.

Unique geological resources (paleontological resources or unique outcrops) are present that could be disturbed by the construction of the proposed project.

Exposure of people or structures to major geologic hazards such as earthquake surface rupture, ground shaking, liquefaction or landslides.

Secondary seismic effects could occur which could damage facility structures, e.g., liquefaction.

Other geological hazards exist which could adversely affect the facility, e.g., landslides, and mudslides.

7.2 Environmental Setting and Impacts

7. a) Risk of Loss, Injury, or Death Involving Seismic Issues. The proposed project is located within the confines of the existing El Segundo Refinery. Concrete pavement presently supports most of the Refinery structures and equipment. Most of El Segundo Refinery roads, including all high traffic roads have been paved. Some portions of the site have also been landscaped. Excavation will be required for the construction of concrete foundations. The local topography for the Refinery site is level. Elevations at the site range between 45 feet above sea level at the northwestern portion of the site to 196 feet above sea level feet at the southeast corner of the site. No unstable earth conditions or changes in geologic substructures are anticipated to occur with the project because of the limited grading and excavation involved and the character of the local topography. No significant adverse impacts on topography and soils are expected.

7. b) Earthquakes. The City of El Segundo is located within a seismically active region. The most significant potential geologic hazard at the Refinery is estimated to be seismic shaking from future earthquakes generated by active or potentially active faults in the region. Table 5 identifies those faults considered important to the project site in terms of potential for future

activity. Seismic records have been available for the last 200 years, with improved instrumental seismic records available for the past 50 years. Based on a review of earthquake data, most of the earthquake epicenters occur along the Whittier-Elsinore, San Andreas, Newport-Inglewood, Malibu-Santa Monica-Raymond Hills, Palos Verdes, Sierra Madre, San Fernando, Elysian Park-Montebello, and Torrance-Wilmington faults (Jones and Hauksson, 1986). All these faults are elements of the San Andreas Fault system. Past experience indicates that there has not been any substantial damage, structural or otherwise to the Refinery as a result of earthquakes. Table 6 identifies the historic earthquakes over magnitude 4.5 in southern California, between 1915 and the present, along various faults in the region.

The Newport-Inglewood Fault Zone: The Newport-Inglewood is located about nine miles east of the Refinery and is a major tectonic structure within the Los Angeles Basin. This fault is best described as a structural zone comprising a series of echelon and sub-parallel fault segments and folds. The faults of the Newport-Inglewood uplift in some cases and exert considerable barrier influence upon the movement of subsurface water (California Department of Water Resources (DWR), 1961). Offsetting of sediments along this fault usually is greater in deeper, older formations. Sediment displacement is less in younger formations. The Alquist-Priolo Act has designated this fault as an earthquake fault zone. The purpose of designating this area as an earthquake fault zone is to mitigate the hazards of fault rupture by prohibiting building structures across the trace of the fault. This fault poses a seismic hazard to the Los Angeles area (Toppozada, et al., 1988, 1989), although no surface faulting has been associated with earthquakes along this structural zone during the past 200 years. Since this fault is located within the Los Angeles Metropolitan area, a major earthquake along this fault would produce more destruction than a magnitude 8.0 on the San Andreas fault. The largest instrumentally recorded event was the 1933 Long Beach earthquake, which occurred on the offshore portion of the Newport-Inglewood structural zone with a magnitude of 6.3. A maximum credible earthquake of magnitude 7.0 has been assigned to this fault zone (Yerkes, 1985). A portion of the Newport-Inglewood fault is sometimes referred to as the Compton fault.

Whittier-Elsinore Fault Zone: The Whittier-Elsinore Fault is located about 22 miles east of the site. The Whittier fault is one of the more prominent structural features in the Los Angeles Basin. It extends from Turnbull Canyon near Whittier, southeast to the Santa Ana River, where it merges with the Elsinore fault. Yerkes (1972) indicated that vertical separation on the fault in the upper Miocene strata increases from approximately 2,000 feet at the Santa Ana River northwestward to approximately 14,000 feet in the Brea-Olinda oil field. Farther to the northwest, the vertical separation decreases to approximately 3,000 feet in the Whittier Narrows of the San Gabriel River.

The fault also has a major right-lateral strike slip component. Yerkes (1972) indicates streams along the fault have been deflected in a right-lateral sense from 4,000 to 5,000 feet. The fault is capable of producing a maximum credible earthquake event of about magnitude 7.1 every 500 to 700 years.

San Andreas Fault Zone: The San Andreas fault is located on the north side of the San Gabriel Mountains trending east-southeast as it passes the Los Angeles Basin. This fault is recognized as the longest and most active fault in California. It is generally characterized as a right-lateral

strike-slip fault which is comprised of numerous sub-parallel faults in a zone over two miles wide. There is a high probability that southern California will experience a magnitude 7.0 or greater earthquake along the San Andreas or San Jacinto fault zones, which could generate strong ground motion in the project area. There is a five to twelve percent probability of such an event occurring in southern California during any one of the next five years and a cumulative 47 percent chance of such an event occurring over a five year period (Reich, 1992).

Malibu-Santa Monica-Raymond Hills Fault Zone: The Raymond Hills fault is part of the fault system that extends from the base of the San Gabriel Mountains westward to beyond the Malibu coast line. The fault has been relatively quiet, with no recorded seismic events in historic time; however, recent studies have found evidence of ground rupture within the last 11,000 years (Triad, 1995).

TABLE 5

MAJOR ACTIVE OR POTENTIALLY ACTIVE FAULTS - SOUTHERN CALIFORNIA

FAULT ZONE	FAULT LENGTH (Miles)	MAXIMUM CREDIBLE EARTHQUAKE	MAXIMUM ACCELERATION (G)
Malibu-Santa Monica-Raymond Hill	65	7.5	0.49
Newport-Inglewood	25	7.0	0.42
Northridge	12	6.7	0.16
Palos Verdes	20	7.0	0.24
San Andreas	200+	8.25	0.21
San Jacinto	112	7.5	0.11
San Fernando	8	6.8	0.17
Sierra Madre	55	7.3	0.23
Whittier-Elsinore	140	7.1	0.46
Elysian Park-Montebello	15	7.1	0.27

Notes: G = acceleration of gravity.

The Palos Verdes Fault Zone: The Palos Verdes fault extends for about 50 miles from the Redondo submarine canyon in Santa Monica Bay to south of Lausen Knoll and is responsible for the uplift of the Palos Verdes Peninsula. This fault is both a right-lateral strike-slip and reverse separation fault. The Gaffey anticline and syncline are reported to extend along the northwestern portion of the Palos Verdes hills. These folds plunge southeast and extend beneath recent alluvium east of the hills and into the San Pedro Harbor, where they may affect movement of ground water (DWR, 1961). The probability of a moderate or major earthquake along the Palos

Verdes fault is low compared to movements on either the Newport-Inglewood or San Andreas faults (Los Angeles Harbor Department, 1980). However, this fault is capable of producing strong to intense ground motion and ground surface rupture. This fault zone has not been placed by the California State Mining and Geology Board into an Alquist-Priolo special studies zone.

TABLE 6

SIGNIFICANT HISTORICAL EARTHQUAKES IN SOUTHERN CALIFORNIA

DATE	LOCATION (epicenter)	MAGNITUDE
1915	Imperial Valley	6.3
1925	Santa Barbara	6.3
1920	Inglewood	4.9
1933	Long Beach	6.3
1940	El Centro	6.7
1940	Santa Monica	4.7
1941	Gardena	4.9
1941	Torrance	5.4
1947	Mojave Desert	6.2
1951	Imperial Valley	5.6
1968	Borrego Mountain	6.5
1971	Sylmar	6.4
1975	Mojave Desert	5.2
1979	Imperial Valley	6.6
1987	Whittier	5.9
1992	Joshua Tree	6.3
1992	Landers	7.4
1992	Big Bear	6.5
1994	Northridge	6.7
1999	Hector Mine	7.1

Sources: Bolt (1988), Jennings (1985), Gere and Shah (1984), Source Fault Hazard Zones in California (1988), Yanev (1974), and personnel communication with the California Division of Mines and Geology.

Sierra Madre Fault System: The Sierra Madre fault system extends for approximately 60 miles along the northern edge of the densely populated San Fernando and San Gabriel valleys (Dolan, et al., 1995) and includes all faults that have participated in the Quaternary uplift of the San Gabriel Mountains. The fault system is complex and appears to be broken into five or six segments each 10 to 15 miles in length (Ehlig, 1975). The fault system is divided into three major faults by Dolan, et al. (1995), including the Sierra Madre, the Cucamonga and the Clamshell-Sawpit faults. The Sierra Madre fault is further divided into three minor fault segments the Azusa, the Altadena and the San Fernando fault segments. The Sierra Madre fault is capable of producing a 7.3 magnitude fault every 805 years (Dolan, et al., 1995).

San Fernando Fault: The westernmost segment of the Sierra Madre fault system is the San Fernando segment. This segment extends for approximately 12 miles beginning at Big Tujunga

Canyon on the east to the joint between the San Gabriel Mountains and the Santa Susana Mountains on the west (Ehlig, 1975). The 1971 Sylmar earthquake occurred along this segment of the Sierra Madre fault system, resulting in a 6.4 magnitude fault. Dolan, et al. (1995) indicates the San Fernando fault segment is capable of producing a 6.8 magnitude fault every 455 years.

The 1994 Northridge earthquake occurred on a fault parallel to the 1971 Sylmar earthquake. However, the dip direction of the two faults is opposite. The Northridge fault dips down to the south, and the Sylmar fault dips down to the north.

Elysian Park-Montebello System: The Elysian Park fault is a blind thrust fault system, i.e., not exposed at the surface, whose existence has been inferred from seismic and geological studies. The system, as defined by Dolan, et al. (1995), comprises two distinct thrust fault systems; 1) an east-west-trending thrust ramp located beneath the Santa Monica Mountains; and 2) a west-northwest-trending system that extends from Elysian Park Hills through downtown Los Angeles and southeastward beneath the Puente Hills. The Elysian Park thrust is capable of producing a magnitude 7.1 earthquake every 1,475 years.

Torrance-Wilmington Fault Zone: The Torrance-Wilmington fault has been reported to be a potentially destructive, deeply buried fault, which underlies the Los Angeles Basin. Kerr (1988) has reported this fault as a low-angle reverse or thrust fault. This proposed fault could be interacting with the Palos Verdes hills at depth. Little is known about this fault, and its existence is inferred from the study of deep earthquakes. Although information is still too preliminary to be able to quantify the specific characteristics of this fault system, this fault appears to be responsible for many of the small to moderate earthquakes within Santa Monica Bay and easterly into the Los Angeles area. This fault itself should not cause surface rupture, only ground shaking in the event of an earthquake.

In addition to the known surface faults, shallow-dipping concealed "blind" thrust faults have been postulated to underlie portions of the Los Angeles Basin. Because there exist few data to define the potential extent of rupture planes associated with these concealed thrust faults, the maximum earthquake that they might generate is largely unknown.

No faults or fault-related features are known to exist at the project site. The site is not located in any Alquist-Priolo Earthquake fault zone and is not expected to be subject to significant surface fault displacement. Therefore, no significant impacts to the proposed project facilities are expected from seismically-induced ground rupture.

Based on the historical record, it is highly probable that earthquakes will affect the Los Angeles region in the future. Research shows that damaging earthquakes will occur on or near recognized faults which show evidence of recent geologic activity. The proximity of major faults to the Refinery increases the probability that an earthquake may impact the Refinery. There is the potential for damage to the new structures in the event of an earthquake. Impacts of an earthquake could include structural failure, spill, etc. The hazards of a release during an earthquake are addressed in the Section 8.0 Hazards and Hazardous Materials below.

New structures at each site must be designed to comply with the Uniform Building Code Zone 4 requirements since the proposed project is located in a seismically active area. The City of El Segundo is responsible for assuring that the proposed project complies with the Uniform Building Code as part of the issuance of the building permits and can conduct inspections to ensure compliance. The Uniform Building Code is considered to be a standard safeguard against major structural failures and loss of life. The goal of the code is to provide structures that will: (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage, but with some non-structural damage; and (3) resist major earthquakes without collapse, but with some structural and non-structural damage. The Uniform Building Code bases seismic design on minimum lateral seismic forces ("ground shaking"). The Uniform Building Code requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes. The basic formulas used for the Uniform Building Code seismic design require determination of the seismic zone and site coefficient, which represent the foundation conditions at the site.

The El Segundo Refinery will be required to obtain building permits, as applicable, for all new structures at the site. The Refinery will submit building plans to the City of El Segundo for review. The Refinery must receive approval of all building plans and building permits to assure compliance with the latest Building Code adopted by the City prior to commencing construction activities. The issuance of building permits from the local agency will assure compliance with the Uniform Building Code requirements which include requirements for building within seismic hazard zones. No significant impacts from seismic hazards are expected since the project will be required to comply with the Uniform Building Codes.

7. b) Soil Erosion

During construction of the proposed project, the possibility exists for temporary erosion resulting from excavation and grading activities. These activities are expected to be minor since the proposed project will occur within already developed facilities in areas with generally flat topography. The proposed project involves the addition of new equipment to existing facilities so major grading/trenching is not expected to be required and is expected to be limited to minor foundation work. Therefore, no significant adverse impacts related to soil erosion are expected. No significant change in topography is expected because little grading/trenching is required that could substantially increase wind erosion or runoff from affected sites. The proposed project will be required to comply with SCAQMD Rule 403 – Fugitive Dust, which imposes requirements to minimize emissions associated with wind erosion. Relative to operation, no change in surface runoff is expected because surface conditions will remain relatively unchanged. Further, surface runoff is minimized because surface runoff at all facilities is typically captured, treated, and discharged under a National Pollutant Discharge Elimination System (NPDES) permit.

7. c) and d) Liquefaction.

Chevron Products Company has the financial, manpower, fire fighting and equipment capabilities to effectively deal with potential hazards resulting from the effects of an earthquake (California Department of Conservation, 1988).

Liquefaction would most likely occur in unconsolidated granular sediments that are water saturated less than 30 feet below ground surface (Tinsley et al., 1985). Based on the latest seismic hazards maps developed under the Seismic Hazards Mapping Act, the El Segundo Refinery is located in an area of historic or has the potential for liquefaction (California Division of Mines and Geology, Map of Seismic Hazard Zones, Venice Quadrangle). There is no evidence of expansive soils at the site. The issuance of building permits from the local agency will assure compliance with the Uniform Building Code requirements, which include requirements for building within potential liquefaction zones. No significant impacts from liquefaction are expected since the project will be required to comply with the Uniform Building Codes.

The proposed project site is not subject to landslide or mudflow since the site is essentially flat. No other unique geological resources have been identified at the El Segundo Refinery.

7. e) The proposed project is not expected to generate additional wastewater discharged by the Refinery. The Refinery discharges wastewater to the local sewer system under an Industrial Wastewater Discharge Permit. The Refinery or the proposed project will not use septic tanks or alternative wastewater disposal systems, therefore, no significant impacts on soils from alternative wastewater disposal systems are expected. During the construction period, construction workers will use portable chemical toilets and wastes will be removed by a private contractor. No sewers are located in the vicinity of the new Hydrogen Plant. During project operation, a holding tank will be used to store sanitary wastes and the wastes will be removed by a private contractor.

7.3 Mitigation Measures

No mitigation measures are required for the construction/operation of the project since no significant impacts to geology are expected.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
8.0	**HAZARDS AND HAZARDOUS MATERIALS.** Would the project:			
a)	Create a significant hazard to the public or the environment through the routine transport, use, and disposal of hazardous materials?	☐	☑	☐
b)	Create a significant hazard to the public or the	☐	☑	☐

	environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			
c)	Emit hazardous emissions, or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☑
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would create a significant hazard to the public or the environment?	☐	☑	☐
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☑
f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☑
g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☑
h)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☑	☐
i)	Significantly increase fire hazard in areas with flammable materials?	☐	☑	☐

8.1 Significance Criteria

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

Non-compliance with any applicable design code or regulation.

Non-conformance to National Fire Protection Association standards.

Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.

Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

8.2 Environmental Setting and Impacts

8. a), and b) Potential Hazards

The El Segundo Refinery uses a number of hazardous materials at the site to manufacture petroleum products. The major types of public safety risks consist of impacts from toxic substance releases, fires and explosions. Toxic substances handled by the Refinery include hydrogen sulfide, ammonia, regulated flammables like propane and butane, and petroleum products like gasoline, fuel oils, and diesel.

Based on a review of operations and processes involved with the new Hydrogen Plant, the following potential hazards were identified and evaluated:

- Release and downwind dispersion of ammonia.
- Downwind travel of flash fire hazard from the release and dispersion of natural gas, fuel gas, and pentanes.
- Torch and pool fire radiation hazards from an ignited pipeline release (natural gas, refinery fuel gas, and pentanes).

Ammonia (both anhydrous and aqueous) will be supplied to the Hydrogen Plant from the existing on-site ammonia-hydrogen sulfide plant located at the Refinery. Chevron operates and produces ammonia on-site so no increase in truck traffic is required to transport ammonia to the Refinery. Therefore, the only potential release of ammonia would be via aboveground pipeline as no new ammonia tanks are proposed as part of the project. Anhydrous and aqueous ammonia are currently produced at the Refinery, supplied to other units within the Refinery, and transported off-site. The proposed project also includes supplying natural gas, refinery fuel gas, and pentanes to the new Hydrogen Plant, so the hazards associated with a pipeline release of these materials were also evaluated.

Modeling was used to calculate release conditions, initial dilution of the vapor (dependent on the release characteristics), and the subsequent dispersion of the vapor introduced into the

atmosphere (see Appendix C). The models contain algorithms that account for thermodynamics, mixture behavior, transient release rates, gas-cloud density relative to air, initial velocity of the released gas, and heat transfer effects from the surrounding atmosphere and the substrate. The models for pool fire and torch fire radiation account for impoundment configuration, material composition, target height relative to the flame. Target distance from the flame, atmospheric attenuation (includes humidity), wind speed, and atmospheric temperature.

Ammonia Gas

Dispersion calculations were performed until a specific ammonia concentration was reached in the downwind direction. The gas concentration chosen was Emergency Response Planning Guideline (ERPG) Level 2 for ammonia, which is 200 ppm. This level is the maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair their ability to take protective action. A release from existing ammonia pipelines was compared to a potential release from the pipelines proposed for the new project using the assumptions shown in Table 7.

TABLE 7

AMMONIA VAPOR DISPERSION ASSUMPTIONS

Ammonia Release	Current Anhydrous Ammonia	Anhydrous Ammonia Feed to Proposed Plant	Aqueous Ammonia to Proposed Plant
Pipeline Diameter	2 inches	2 inches	2 inches
Material Composition	Anhydrous Ammonia	Anhydrous Ammonia	Aqueous Ammonia
Temperature	87°F	87°F	87°F
Pressure	170 psig	170 psig	180 psig
Average Flow Rate	13 gpm	13 gpm	0.15 gpm
Approximate length of pipeline	5000 ft.	1100 ft.	750 ft.

Flammable Gas Hazards

Fire radiation calculations were made to determine the downwind distance of the flash fire hazard as defined by the flammable cloud following the release of natural gas, fuel gas and pentanes. The dispersion calculations were performed until the Lower Flammable Limit (LFL) was reached. For the natural gas and fuel gas jet dispersion calculations, this concentration was five percent on a molar (or volume) basis (five percent is the LFL for methane which is the primary component in the gas streams. For the evaporating pool of pentanes, this concentration was taken to be 1.5 percent on a molar (or volume) basis (the LFL for *n*-pentane). The assumptions used in the hazard calculations for the flammable pipelines are shown in Table 8.

Hydrogen gases can also exhibit flammable characteristics. The assumptions used in the hazard calculations for the existing and new hydrogen pipelines are shown in Table 9.

TABLE 8

FLAMMABLE MATERIALS ASSUMPTIONS

PARAMETERS	ASSUMPTIONS		
Pipeline Diameter	10 Inches	6 Inches	3 Inches
Material Composition	Natural Gas	Fuel Gas	Pentanes
Temperature	60°F	65°F	70°F
Pressure	130 psig	85 psig	150 psig
Average Flow Rate	21 mmscfd	10 mmscfd	42,000 lb/hr
Approximate Length of Pipeline	6000 ft.	650 ft.	630 ft.

TABLE 9

HYDROGEN PIPELINE ASSUMPTIONS

PARAMETERS	Existing SMR Product H_2 Pipeline	Proposed H_2 Pipeline 1	Proposed H_2 Pipeline 2
Pipeline Diameter	8 Inches	8 Inches	8 Inches
Material Composition	95.7% mol H_2	99% mol H_2	99% mol H_2
Temperature	70°F	104°F	100°F
Pressure	835 psig	391 psig	935 psig
Average Flow Rate	88.55 mmscfd	90 mmscfd	90 mmscfd
Approximate Length of Pipeline	420 ft.	400 ft.	910 ft.

Hazards Analysis

The results of the Hazard Analysis are shown in Table 10.

TABLE 10

MAXIMUM HAZARD ZONE SUMMARY

Pipeline	Existing/Proposed	Maximum Extent of Hazard (ft)		
		200 ppm NH_3	LFL	1,600 Btu/(hr ft^2)
Anhydrous NH_3	Existing	3,050	N/A	N/A
Anhydrous NH_3	Proposed	2,040	N/A	N/A
Aqueous NH_3	Proposed	65	N/A	N/A
Natural gas	Proposed	N/A	85	120
Fuel gas	Proposed	N/A	55	75
Pentanes	Proposed	N/A	60	50
Hydrogen	Existing	N/A	100	90
Hydrogen #1	Proposed	N/A	90	85
Hydrogen #2	Proposed	N/A	95	95

The largest potential hazard is posed by a failure of the existing anhydrous ammonia line. Addition of the new, shorter anhydrous ammonia line will present a smaller hazard than the existing line. The new aqueous ammonia line will present a significantly smaller hazard than either anhydrous ammonia line.

The torch fire radiation presents a larger hazard zone than does the flash fire for both the natural gas and fuel gas lines. The flash fire hazard zone for the pentane pipeline is larger than the pool fire radiation hazard zone. The hazard zones for a flash fire and torch fire radiation are well within the confines of the Refinery boundaries. See Appendix C for the details of the Hazard Analysis. The proposed project will not introduce any new hazards and will not result in greater hazard zones than currently exist for the Refinery. Therefore, no significant hazard impacts are expected.

The proposed project will not result in an increase in the transport of hazardous materials. In fact, the proposed project will reduce the ammonia transported offsite from the ammonia plant, thereby reducing the transportation risk associated with ammonia from the Refinery.

A variety of safety laws and regulations have been in existence for many years to reduce the risk of accidental releases of chemicals at industrial facilities. The Occupational Safety and Health Agency (OSHA) passed the Process Safety Management of Highly Hazardous Chemicals Code of Federal Regulations (CFR) 29 910.119 rule in 1992. This rule was designed to address the prevention of catastrophic accidents at facilities handling hazardous substances in excess of specific threshold amounts through implementation of Process Safety Management (PSM) systems. Major requirements of this rule were protection of workers at the facility and performance of process hazard analysis. In this way, potential accidents were anticipated and safeguards implemented or improved to prevent accidents.

California adopted United States Environmental Protection Agency (U.S.EPA) federally established Risk Management Program (RMP) in 1997. RMPs contain hazard assessment of potential worst-credible accidents, an accident prevention program, and an emergency response program. The City of El Segundo Fire Department administers this program for the Refinery. In addition, the Refinery has prepared an emergency response manual, which describes the

emergency response procedures that would be followed in the event of any of several release scenarios along with the responsibilities of key personnel.

The Refinery adheres to the following safety design and process standards:

- The California Health and Safety Code Fire Protection specifications.
- The design standards for petroleum refinery equipment established by American Petroleum Institute, American Society of Mechanical Engineers, the American Institute of Chemical Engineers, the American National Standards Institute, and the American Society of Testing and Materials.
- The applicable Cal-OSHA requirements.
- The Refinery maintains its own emergency response capabilities, including onsite equipment and trained emergency response personnel who are available to respond to emergencies anywhere within the Refinery.

8. c) No existing or proposed schools are located within one-quarter mile of the existing Refinery so that no significant adverse impacts are expected to a school.

Other Hazard Issues

8. d) The proposed project is not located on a site which is included on the recent list of hazardous materials sites compiled pursuant to Government Code Section 65962.5; therefore, no significant hazards related to hazardous materials at the site on the environment or to the public are expected.

8. e) and f) The proposed project site is located within two miles of the Los Angeles International Airport. The proposed modifications to the Refinery are comparable to the existing facilities and would not increase safety hazards for people residing or working in the project area. The new Hydrogen Plant will be located near the existing hydrogen plant and within the confines of the existing Refinery. The height of the new Hydrogen Plant is about the same as the existing hydrogen plant and will not exceed Federal Aviation Administration requirements. Therefore, no safety hazards are expected from the proposed project on the airport.

8. g) The proposed project is not expected to interfere with an emergency response plan or emergency evacuation plan. The proposed project will result in modifications to the existing Refinery. All construction activities will occur within the confines of the existing refinery so that no emergency response plans should be impacted. Chevron has implemented emergency response plans at its facility, but no modifications to the plans are expected as a result of the proposed project. The proposed project is not expected to alter the route that employees would take to evacuate the site, as the evacuation routes generally directs employees outside of the main operating portions of the Refinery. The proposed project is not expected to impact any emergency response plans.

8. h) and i) The proposed project will not increase the existing risk of fire hazards in areas with flammable brush, grass, or trees. The Refinery will continue to use and produce flammable materials. Natural gas and refinery fuel gas (which has the same flammable properties as natural gas) are currently used at the site. The hazards associated with natural and refinery fuel gas where modeled and it was determined that a fire would be expected to remain on-site so that there would be no public exposure to the fire hazards. No substantial or native vegetation exists within the operational portions of the Refinery. Therefore, no significant increase in fire hazards is expected at the Refinery associated with the proposed project.

8.3 Mitigation Measures

No mitigation is required since no significant impacts have been identified.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
9.0	**HYDROLOGY AND WATER QUALITY.** Would the project:			
a)	Violate any water quality standards or waste discharge requirements?	☐	☐	☑
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☑
c)	Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site?	☐	☐	☑
d)	Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?	☐	☑	☐
e)	Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide	☐	☑	☐

	substantial additional sources of polluted runoff?			
f)	Otherwise substantially degrade water quality?	☐	☐	☑
g)	Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☑
h)	Place within a 100-year flood hazard area structures, which would impede or redirect flood flows?	☐	☐	☑
i)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☑
j)	Inundation by seiche, tsunami, or mudflow?	☐	☑	☐
k)	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☑
l)	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☑
m)	Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☑
n)	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☑
o)	Require in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☑

9.1 Significance Criteria

Potential impacts on water resources will be considered significant if any of the following criteria apply:

Water Quality:

The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.

The project will cause the degradation of surface water substantially affecting current or future uses.

The project will result in a violation of NPDES permit requirements.

The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.

The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.

The project results in alterations to the course or flow of floodwaters.

Water Demand:

The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use a substantial amount of potable water.

The project increases demand for water by more than five million gallons a day.

9. a), f), k), l) and o) Wastewater Generation.

Under National Pollutant Discharge Elimination System (NPDES) permit discharge limits, Permit No. CA0000337, the Refinery is authorized to discharge up to 8.8 million gallons of treated wastewater during dry weather and up to 23 million gallons per day during wet weather to the Bay (Pacific Ocean) near Dockweiler State Beach in El Segundo. The wastewater is discharged 3,500 feet offshore and effluent monitoring reports are submitted monthly to the Los Angeles Regional Water Quality Control Board (LARWQCB). The requirements of the permit specifically address effluent discharges to the Bay.

Wastewater is collected and treated in two separate drain and treatment systems, a segregated system and an unsegregated system. The unsegregated system is normally used for non-process wastewater, including cooling tower blowdown, steam condensate, a portion of the water pumped from ground water recovery wells, and other wastewater streams containing free oil recovered with primary (physical) treatment only. This system consists of a gravity separator and Induced Air Flotation (IAF) units The unsegregated system is also used to collect and treat stormwater.

The segregated system is normally used to treat process wastewater containing emulsified oil, organic chemicals, and a portion of the water pumped from ground water recovery wells. This system consists of gravity separators, a dissolved air flotation unit (DAF), and activated sludge units for secondary (biological) treatment. Effluent that does not meet discharge limits may receive additional solids removal from an auxiliary off-specification DAF unit or be routed to two auxiliary effluent diversion tanks for additional treatment.

Sanitary wastes will be minimal (less than 200 gallons per day) in the construction area and will be collected in portable chemical toilets. Wastes will be removed and disposed of offsite by a private contractor so no significant wastewater impacts are expected during the construction phase. During normal operation, a holding tank will be used to store sanitary wastes and wastes will be collected and removed by a private contractor for treatment and disposal.
The proposed plant will result in an estimated increase in wastewater discharged of about 1,300 gallons per day during maximum operating capacity, primarily from boiler blowdown and steam condensate. Under Chevron's NPDES permit, the Refinery is authorized to discharge up to 8.8 million gallons per day of treated wastewater during dry weather and up to 23 million gallons per day during wet weather. The wastewater discharge volume after project implementation is expected to be well within the existing limits of the NPDES permit, so a modification of the existing NPDES permit will not be required. As a result, no significant adverse impacts associated with wastewater discharges are expected.

Pursuant to the Regional Water Quality Control Board (RWQCB) Order, a ground water monitoring program was implemented to evaluate ground water quality at and in the vicinity of the Refinery. Ground water monitoring consists of a network of monitoring wells, which includes wells located within and down gradient of the site. Ground water contamination has been identified at the Refinery and the Refinery has implemented hydrocarbon removal and recovery activities for ground water.

Construction activities could uncover contaminated soils, given the heavily industrialized nature of the Refinery and the fact that refining activities, petroleum storage, and distribution have been conducted at the site for a number of years. Currently, there is no evidence that soil contamination is located within the areas proposed for grading, trenching or excavation.

Contaminated soils or water may require remediation (cleanup and safe removal and disposal) if detected above certain concentrations during construction activities. Even if soils or ground water at a contaminated area do not have the characteristics required to be defined as hazardous wastes, remediation of the area may be required by regulatory agencies. Soil that is found to be contaminated will be analyzed by a State-certified laboratory to determine the concentration and type of contamination.

If soil contamination is suspected, the contaminated soil would be handled in accordance with appropriate federal, state and local regulations, including SCAQMD Rule 1166 – Volatile Organic Compound Emissions from Decontamination of Soil, the federal Resource Conservation and Recovery Act, the Regional Water Quality Control Board (RWQCB)'s Remedial Action Plan requirements, and the DTSC's Hazardous Waste Management Program. The government agency that will provide regulatory oversight depends on the extent of the soil clean-up. Currently, the

Chevron Refinery is subject to numerous rules and regulations that help to minimize the release of hazardous substances including Federal OSHA regulations (29 CFR Part 1910, §119), Title 8 of the California Code of Regulations (§5189), California Health and Safety Code §255534, 40 CFR Part 68 and Title 1, §112(2)(7).

To the extent feasible, all excavated non-contaminated soil will be used for backfill and/or grading at the project site. Contaminated soil may be re-used on-site, as permitted by the RWQCB, or taken to an approved off-site treatment/disposal facility.

The proposed project is not expected to have a significant adverse effect on the quality of ground water in the area. The Hydrogen Plant site will be partially paved to support the new facilities. These paved areas would reduce the potential for percolation of water into the ground water and minimize the potential for contaminants to enter the ground water. No significant adverse impacts are expected to ground water quality from the proposed project because stormwater and industrial wastewater will be controlled on-site, treated as required, and monitored prior to discharge, and no underground storage facilities are proposed as part of the project.

9. b) and n) Water Demand

The Refinery uses two sources of water: municipal water and reclaimed water. Municipal water use is approximately 8.5 million gallons per day and reclaimed water is 3.5 gallons per day (SCAQMD, 2001). The proposed project activities will increase water usage at the Refinery by about 193,000 gallons per day. The additional water will be provided by the Metropolitan Water District and the West Basin Municipal Water District. The incremental increase in water use does not exceed the SCAQMD's significance threshold of 5 million gallons per day. Water supply impacts are not considered significant.

Chevron does not directly use ground water as a source of water. The West Basin Municipal Water District primarily supplies reclaimed water for use at the Chevron Refinery, which is not ground water. Water also is supplied by the Metropolitan Water District, which primarily supplies water from surface water sources, e.g., the Colorado River and the State Water Project, but historically has included ground water sources. The Metropolitan Water District has compared the water demand forecasts and supply capabilities over the next 20 years under varying hydrologic conditions. The analysis finds that current practices allow the Metropolitan Water District to bring water supplies on-line at least ten years in advance of demand with a very high degree of reliability. If all imported water supply programs and local projects proceed as planned, with no change in demand projections, reliability could be assured beyond 20 years (MWD, 2002).

9. c), d), e) and m) Surface Water. The ground surface generally slopes from east to west in the site and vicinity. Surface water flows into impound basins located throughout the Refinery. Each of the impound basins can only be emptied by manual activation of pumps, ejectors, and vacuum trucks, or through percolation. Rainfall runoff from these areas may be pumped to the wastewater system. During severe rainstorms, excess runoff is collected and pumped into effluent diversion tanks, which have a holding capacity of 13,770,540 gallons. From the tanks, water can be routed to either treatment system prior to discharge. Chevron Products Company

treats all of its stormwater flows and has implemented a Stormwater Pollution Prevention Plan and a Spill Prevention Control and Countermeasure Plan.

Stormwater runoff from the project site will not be adversely affected as a result of the proposed project. The Refinery has an existing NPDES permit for the discharge of stormwater. Stormwater discharges at the Refinery due to the proposed project activities will be in compliance with the existing permit conditions. The Stormwater Pollution Prevention plans will be updated, as necessary, to reflect operational modifications and include additional Best Management Practices, if required. No new storm drainage facilities or expansion of existing storm facilities are expected to be required. Since stormwater discharge or runoff to the local stormwater system is not expected to change in either volume or water quality, no significant stormwater quality impacts are expected to result from the operation of the proposed project.

9. g), h), i) and j) Based on the topography and/or site elevations in relation to the ocean, the proposed project is not expected to result in an increased risk of flood, seiche, tsunami or mud flow hazards. The proposed project would not located housing within a 100-year flood hazard area. The Refinery is not located within a 100-year flood hazard zone so no new equipment would be located within a 100-year flood hazard zone. Therefore, no significant impacts associated with flooding are expected.

9.3 Mitigation Measures

No significant adverse impacts to water quality and supply are expected as a result of the activities associated with the proposed project. The existing water supply and disposal systems are adequate to meet the demand of the project. Stormwater will be controlled, and neither surface nor groundwater resources will be adversely affected. No specific mitigation measures are required. Chevron Products Company will continue to use water conservation measures to reduce the use of fresh water and increase the reuse of wastewater.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
10.0	**LAND USE AND PLANNING.** Would the project**:**			
a)	Physically divide an established community?	☐	☐	☑
b)	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☑
c)	Conflict with any applicable habitat conservation	☐	☐	☑

or natural community conservation plan?

10.1 Significant Criteria

Land use and planning impacts will be considered significant if the project conflicts with the land use and zoning designations established by the City of El Segundo.

10.2. Environmental Setting and Impacts

10. a), b), and c) The proposed modifications to the Refinery will be developed within the existing Refinery property boundaries. Land use on the Refinery property is dominated by heavy industry and manufacturing. Operation of the proposed Hydrogen Plant is consistent with the land use designation of heavy industry and manufacturing.

Land to the north of the Refinery on the north side of El Segundo Boulevard is primarily industrial and commercial. Residential development is located farther north of the industrial and commercial uses fronting El Segundo Boulevard. Land to the northeast of the Refinery is designated for mixed-use commercial purposes.

Land uses east of the Refinery on the east side of Sepulveda Boulevard include primarily light and heavy industrial, with some areas designated for open space and public facilities.

South of the Refinery is Rosecrans Avenue, beyond which are single-family residences located within the City of Manhattan Beach. Land use southeast of the Refinery within the Manhattan Beach City limits includes mixed-use commercial development such as hotels, shopping centers, and office buildings.

West of the Refinery is Vista Del Mar Boulevard, beyond which is Dockweiler State Beach and the Pacific Ocean. Other coastal development in the vicinity of the Refinery includes City of Los Angeles facilities such as the Hyperion Sewage Treatment Plant and the Los Angeles Department of Water and Power's Scattergood Generating Station, as well as the El Segundo Power II LLC power plant.

No new property will be acquired for the project and there will be no impacts to established communities. Additionally, the proposed project is not expected to conflict with local habitat conservation plans or natural community conversion plans as the proposed project site is previously developed industrial facilities. The proposed project will not trigger changes in the current zoning designations at the project site. Based on these considerations, no significant adverse impacts to established residential or natural communities are expected

The proposed project includes construction at an existing industrial facility. The activities and products produced at the facility for the proposed project are the same as existing activities and products produced. No new land would be required for the project and no zoning and/or land use changes are required to be necessary as part of the project.

The Refinery is zoned by the City of El Segundo as Heavy Industrial (M-2). Zoning surrounding the Refinery varies from commercial to industrial. To the north of the Refinery, zoning designations (from west to east) include Open Space (O-S) and Multi-Family Residential (R-3), Parking (P), Downtown Specific Plan (DSP), Medium Manufacturing (MM), and Corporate Office (CO). To the east of the Refinery, zoning designations include Open Space (O-S), Light Industrial (M-1), Public Facilties (P-F), and Heavy Industrial (M-2). A small portion along the east side of Sepulveda Boulevard, just south of El Segundo Boulevard, is designated Parking (P) and General Commercial (C-3). South of the Refinery, zoning designations (City of Manhattan Beach) include Medium Density Residential (RM), Single Family Residence (RS), and High Density Residential (RH). West of the Refinery is the Pacific Ocean.

Land use at the Refinery and in the surrounding vicinity is consistent with the City of El Segundo General Plan land use designations for the area. The Land Use element of the General Plan currently in force was adopted in December 1992. No revisions to the Land Use element have occurred since December 1992.

10.3 Mitigation Measures

No significant impacts to land use are expected to occur as a result of construction or operation of the proposed project. Therefore, no mitigation is necessary or proposed.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
11.0 MINERAL RESOURCES. Would the project:			
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☑
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☑

11.1 Significance Criteria

Project related impacts on mineral resources would be considered significant if any of the following conditions were met:

The project would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

The proposed project results in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific or other land use plan.

11.2. Environmental Setting and Impacts

11. a) As the project is to be limited to modifications within the confines of the existing Refinery boundaries, no loss of availability of know mineral resource that would be of value to the region or the residents of the state is expected. No mineral extraction is anticipated to occur during the construction phase of the project.

11. b) The project is not expected to result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

11.3 Mitigation Measures

No significant impacts to mineral resources are expected to occur as a result of construction or operation of the proposed project. Therefore, no mitigation is necessary or proposed.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
12.0	**NOISE.** Would the project result in:			
a)	Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☑	☐
b)	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☑	☐
c)	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☑	☐
d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☑	☐

e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☑	☐
e)	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☑

12.1 Significance Criteria

Impacts on noise will be considered significant if:

Construction noise levels exceed the City noise ordinance or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three decibels (dBA) at the site boundary. Construction noise levels will be considered significant if they exceed federal Occupational Safety and Health Administration (OSHA) noise standards for workers.

The project operational noise levels exceed any of the local noise ordinances at the site boundary or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three dBA at the site boundary.

TABLE 11

LOCAL NOISE GUIDELINES AND ORDINANCES

City	Construction Limit	Operations Limit (exterior dBA)
El Segundo	L_{50} = 65 dBA No construction noise from 6:00 pm to 7:00 am or Sundays/holidays	Residential: L_{50} = 5 dBA over ambient noise level; Commercial/Industrial L_{50} = 8 dBA over ambient noise level
Manhattan Beach	Construction allowed: Monday through Friday 7:30 am to 6:00 pm, Saturday 9:00 am to 6:00 pm and Sunday 10:00 am to 4:00 pm	Residential: L_{50} = 50 dBA (daytime); Commercial: Residential limits +15 dBA Industrial: Residential limits + 20 dBA

12.2 Environmental Setting and Impacts

The Refinery land use is designated commercial and residential to the north, industrial, open, and public land to the east, residential to the south, and industrial to the west. The ambient noise

environment in the project vicinity is composed of contributions from equipment and operations within these commercial and industrial areas, and from traffic on roads along or near each of its property boundaries (El Segundo Boulevard, Sepulveda Boulevard, Rosecrans Avenue, and Vista Del Mar).

Noise impacts from operation and construction of the proposed project at the Refinery are determined by the local city noise regulations which are summarized in Table 11 and by the incremental increase in existing noise.

The Refinery is located within the City of El Segundo. El Segundo's Municipal Code limits construction noise to 65 dBA in the daytime (7:00 am to 6:00 pm). In addition, construction occurring between 6:00 pm and 7:00 am, or on Sundays or holidays may not cause a disturbance.

El Segundo's municipal code also limits operational noise to specific statistical sound levels, Lx, where L is the A-weighted sound level that may not be exceeded over "X" percent of the measured time period. El Segundo bases its noise limits on a 60 minute period and specifies L_{50} (30 minutes of every hour) limits for two zone types: residential and commercial/industrial. El Segundo limits are summarized for residential and commercial/industrial zones in Table 11 and limit the L_{50} to five dBA above ambient (existing) sound level for residential zones and eight dBA above ambient for commercial or industrial zones.

The City of Manhattan Beach is located adjacent to the southern boundary of the Refinery. The City of Manhattan Beach Noise Ordinance limits noise from construction to Monday through Friday from 7:30 am to 6:00 pm, Saturday 9:00 am to 6:00 pm and Sunday from 10:00 am to 4:00 pm. The City of Manhattan Beach noise ordinance limits operational noise according to zone designation to a 60-minute L_{50}, L_{25}, $L_{8.3}$, $L_{1.7}$, and L_{max}. The Refinery and adjoining properties are located in a mix of residential, commercial, and industrial zones. Noise limits for these zones are summarized in Table 11.

The nearest sensitive receptors to Refinery noise are residences located in the City of Manhattan Beach, approximately 200 to 400 feet south of the Refinery along Rosecrans Avenue. The next sensitive receptors are residences approximately 1/8-mile north of the Refinery. A noise survey was done between December 2000 – January 2001 to the north and south of the Refinery. The existing Community Noise Equivalent Level (CNEL) for both north and south ranged from 59 to 63 dBA (decibel), which falls within the "normally acceptable" range for both commercial and residential land use (SCAQMD, 2001).

12. a), b) and c) The proposed project will add equipment to the existing Refinery so that additional noise sources will operate at the facility. The main sources of noise associated with the proposed project would be the reformer heater, PSA, and compressors. In order to minimize noise levels, Chevron will require that noise levels associated with the reformer heater be limited to no more than 80 dBA at three feet. This noise specification will be enforced and included as part of the equipment purchase agreement for all new and modified equipment. In order to provide a conservative noise analysis, it is assumed that the noise level from new equipment will be 80 dBA at 50 feet. The estimated noise levels associated with the proposed project operation are summarized in Table 12.

Based on the noise calculations, noise generated by project equipment would not increase the overall noise levels at the Refinery (when compared to baseline conditions). The noise analysis is expected to be conservative because no credit was taken for shielding from the topography or from noise reductions associated with the removal of the existing Hydrogen Plant. Therefore, no significant adverse noise impacts related to project operation are expected. The noise levels in the area are expected to comply with the City's Noise ordinance.

12. d) Construction activity for the project will produce noise as a result of operation of construction equipment. Typical sound levels for typical construction equipment are presented in Table 13.

TABLE 12

PROJECT OPERATIONAL NOISE LEVELS

Location	Baseline Noise Levels (dBA)(1)	Distance from New Units to Noise Sampling Locations (feet)	Operational Sound Level at Noise Sampling Locations (dBA)	Total Sound Level at Noise Sampling Location (dBA)(2)	Increased Noise Levels due to Operation at Noise Sampling Locations (dBA)
Residential area, 3600 Pine Ave at Rosecrans – 500 feet south of Gate 20	62	1,320	56	62.5	<1
Residential area, Pacific Ave at Rosecrans – 900 feet south of Gate 21	61	1,600	50	61.3	<1
Lomita Ave. at El Segundo, school behind St. Anthonys Church – 1,000 feet north of Refinery	61	5,300	40	61.0	<1

(1) SCAQMD, 2001.

(2) The total sound level was calculated using the following formula: $T_{sl}=10\log_{10}(10^{Bsl/10} + 10^{Osl/10})$ where T_{sl} = the total sound level (dBA); B_{sl} = baseline sound level (dBA); and O_{sl} = operational construction sound level (dBA)

TABLE 13

CONSTRUCTION NOISE SOURCES

EQUIPMENT	TYPICAL RANGE (decibels)[1]	ANALYSIS VALUE (decibels)[2]
Truck	82-95	82
Front Loader	73-86	82
Air Compressor	85-91	85
Concrete Pumps	81-85	81
Scrapers, Graders	80-93	80
Pavers	85-88	85
Cranes	75-89	85

(1) City of Los Angeles, 1998. Levels are in dBA at 50-foot reference distance. These values are based on a range of equipment and operating conditions.

(2) Analysis values are intended to reflect noise levels from equipment in good conditions, with appropriate mufflers, air intake silencers, etc. In addition, these values assume averaging of sound level over all directions from the listed piece of equipment.

TABLE 14

PROJECT CONSTRUCTION NOISE LEVELS

Location	Baseline Noise Levels (dBA)[1]	Distance from New Units to Noise Sampling Locations (feet)	Construction Sound Level at Noise Sampling Locations (dBA)	Total Sound Level at Noise Sampling Location (dBA)[2]	Increased Noise Levels due to Construction at Noise Sampling Locations (dBA)
Residential area, 3600 Pine Ave at Rosecrans – 500 feet south of Gate 20	62	1,320	53	62.5	<1
Residential area, Pacific Ave at Rosecrans – 900 feet south of Gate 21	61	1,600	50	61.3	<1
Lomita Ave. at El Segundo, school behind St. Anthonys Church – 1,000 feet north of Refinery	61	5,300	41	61.0	<1

(1) SCAQMD, 2001.

(2) The total sound level was calculated using the following formula: $T_{sl}=10\log_{10}(10^{Bsl/10} + 10^{Osl/10})$ where T_{sl} = the total sound level (dBA); B_{sl} = baseline sound level (dBA); and O_{sl} = operational construction sound level (dBA)

The construction equipment at the Refinery will include welding machines, trucks, cranes, compressors, loaders, concrete pumps, graders, and pavers. The estimated noise level during equipment installation is expected to be an average of about 80 dBA at 50 feet from the center of construction activity. Using an estimated six dBA reduction for every doubling distance past 50 feet (100 feet, 200 feet, 400 feet, etc.), the noise levels at the receptors near the Refinery were estimated (see Table 14). Most of the construction noise sources will be located near ground level, so the noise levels are expected to attenuate further than analyzed herein. In order to provide a conservative estimate of the noise impact, noise attenuation due to existing structures has not been included in the analysis.

The construction activities that generate noise will generally be carried out during the daytime from Monday to Friday, or as permitted by the local city. Because of the nature of the construction activities, the types, number, operation time, and loudness of construction equipment will vary throughout the construction period. As a result, the sound level associated with construction will change as construction progresses. Construction noise sources will be temporary and will cease following construction activities. Noise levels at the areas surrounding the Refinery are not expected to increase by more than one decibel (see Table 14). The noise level from the construction equipment is expected to be within the allowable noise levels established by the local noise ordinance for industrial areas, which is about 70 dBA (see Table 10). Noise impacts associated with the proposed project construction activities are expected to be less than significant.

Workers exposed to noise sources in excess of 85 dBA are required by Occupational Health and Safety Administration (OSHA) requirements to participate in a hearing conservation program. Workers exposed to noise sources in excess of 90 dBA for an eight-hour period will be required (by OSHA regulations) to wear hearing protection devices that conform to OSHA/National Institute for Occupational Safety and Health (NIOSH) standards. Since the maximum noise levels during construction activities are expected to be 80 decibels or less, no significant noise impacts to workers during construction activities are expected.

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12. e) and f) The proposed project site is not located within an airport land use plan or within the vicinity of a private airstrip. The proposed project is located within two miles of the Los Angeles International Airport. The proposed project would not add residential units to the area. The types of noise expected from the proposed project would be unlikely to significantly interact with noise generated from the airport, since the new equipment would be located about 1.5 miles south of the airport. Further, the Refinery is not located within the normal flight pattern of the airport. Thus, the proposed project would not increase the noise levels to people residing or working in the area, relative to existing noise levels from LAX.

12.3 Mitigation Measures

No significant impacts to noise levels are expected to occur as a result of construction or operation of the proposed project. Therefore, no mitigation is necessary or proposed.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
13.0 POPULATION AND HOUSING. Would the project:			
a) Induce substantial growth in an area either directly (for example, by proposing new homes and businesses) or indirectly (e.g. through extension of roads or other infrastructure)?	☐	☐	☑
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☑
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☑

13.1. Significance Criteria

The impacts of the proposed project on population and housing will be considered significant if the following criteria are exceeded:

The demand for temporary or permanent housing exceeds existing supply.

The proposed project produces additional population; housing or employment inconsistent with adopted plans either in terms of overall amount or location.

13.2. Environmental Setting and Impacts

13. a), b) and c) The 2000 census indicates that about 16,033 people reside in the City of El Segundo. The total population of Los Angeles County is about 9,637,494.

The Chevron Products Company Refinery currently provides jobs for about 200 employees. The majority of the personnel are employed during the day shift. Manufacturing is the dominant economic sector within the City of El Segundo, accounting for more than one-third of the City's employment positions.

The proposed project would require modifications to the existing Refinery and will not involve an increase, decrease or relocation of population. Labor (an estimated 200 employees) for construction is expected to come from the existing labor pool in southern California. Operation of the proposed project is expected to require nine new permanent employees at the Refinery which are also expected to come from the existing labor pool. Therefore, construction and

operation of the proposed project are not expected to have significant impacts on population or housing, induce substantial population growth, or exceed the growth projections contained in any adopted plans.

13.3 Mitigation Measures

No mitigation measures are required for the construction/operation of the project since no significant impacts to population and housing are expected.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
14.0. PUBLIC SERVICES. Would the proposal result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:			
a) Fire protection?	☐	☑	☐
b) Police protection?	☐	☑	☐
c) Schools?	☐	☐	☑
d) Parks?	☐	☐	☑
e) Other public facilities?	☐	☐	☑

14.1. Significance Criteria

Impacts on public services will be considered significant if the project results in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, or the need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response time or other performance objectives.

14.2 Environmental Setting and Impacts

14. a) Chevron maintains its own onsite fire department at the Refinery. This organization is recognized by the California State Fire Marshal's office as a professional functioning fire department. The Refinery fire department is regulated by both federal and state's OSHA standards, and adheres to National Fire Protection Association standards. The Refinery's fire

department is capable of responding to petroleum and structural fires, hazardous material releases and spills, and confined-space rescues.

The Refinery notifies the City of El Segundo Fire Department when an incident occurs that may affect the environment or poses a life safety hazard to employees or the public. The Refinery also maintains a mutual aid agreement with other refineries in the Los Angeles area. Under this agreement, the Refinery can request the assistance and resources of other refineries to control and manage a major incident.

Chevron's fire department includes 20 full-time Chevron employees. A four-person crew is on duty at the Refinery at all times. In addition, a Fire Prevention Officer and the Fire Chief are on duty Monday through Friday during the day shift. Fire and rescue personnel are trained on an on-going basis. The on-duty fire crews are also supported by volunteer firemen who are trained to assist in the event of an emergency.

The Refinery is also served by the City of El Segundo Fire Department, which maintains two fire stations within the city limits. All personnel at the El Segundo Fire Department are certified Emergency Medical Technicians. Average response time for all facilities within city limits is between two and four minutes (SCAQMD, 2001). No significant impacts to fire services provided by the City of El Segundo Fire Department are expected to occur as a result of either construction or operation of the proposed project. The proposed project involves the removal of an old hydrogen plant and the construction of a new Hydrogen Plant. No new fire hazards will be added to the Refinery. Additionally, fire stations in the areas near the Refinery are equipped to handle emergency response incidents at industrial facilities. Close coordination with local fire departments and emergency services will be continued.

14. b) The Refinery is an existing facility with a 24-hour security force for people and property currently in place. Because the proposed project includes dismantling a refinery unit and replacing it with a new refinery unit that performs the same function, there would be no need for new or expanded police protection.

14. c), d) and e) The local workforce is more than adequate to fill the short-term construction positions required for this project. Therefore, there will be no increase in the local population, and thus no impacts are expected to schools, parks, or other public facilities.

14.3 Mitigation Measures

Because no significant impacts to public services are expected as a result of the proposed project, no mitigation is necessary or proposed.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
15.0 RECREATION.			
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☑
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☑

15.1 Significance Criteria

The impacts to recreation will be considered significant if:

The project results in an increased demand for neighborhood or regional parks or other recreational facilities.

The project adversely effects existing recreational opportunities.

15.2. Environmental Setting and Impacts

15. a) and b) There would be no significant changes in population densities resulting from the project and thus no increase in the use of existing neighborhood and regional parks or other recreational facilities.

The project does not include recreational facilities or require the construction or expansion of existing recreational facilities.

15.3 Mitigation Measures

No significant impacts to recreational resources are expected to occur as a result of construction or operation of the proposed project. Therefore, no mitigation is necessary or proposed.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
16.0. SOLID/HAZARDOUS WASTE. Would the project:			
a) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☑
b) Comply with federal, state, and local statutes and regulations related to solid and hazardous waste?	☐	☐	☑

16.1 Significance Criteria

The proposed project impacts on solid/hazardous waste will be considered significant if the following occur:

> The generation and disposal of hazardous and non-hazardous waste exceeds the capacity of designated landfills.

16.2 Environmental Setting and Impacts

16. a) Non-Hazardous Waste

The Refinery generates non-hazardous solid or municipal wastes. Most of these wastes are generated in the administrative operations of the Refinery. The status of the landfills to which the Refinery may send municipal solid wastes is summarized in Table 15.

The Los Angeles County Sanitation District (LACSD) anticipates that landfill capacity in the county will be exceeded in the near future. Because of community resistance to the extension of operating permits for existing facilities, to the opening of new landfills in the county, and the dwindling capacity of those landfills with operating permit time left, the exact date on which that capacity will be exceeded is uncertain. The LACSD is currently exploring out of county disposal options, in addition to continuing negotiations to extend current operating permits.

Demolition of the existing hydrogen plant along with grading to provide foundations for the new plant and installation of new structures would result in increased generation of non-hazardous (municipal) wastes at the Refinery. A portion of this waste is expected to be recycled for metal content. The remaining waste is expected to go to the Bradley Canyon landfill, which is maintained by the Los Angeles County Sanitation District. Bradley Canyon has the capacity to accept the waste generated by the proposed project (see Table 15).

Construction activities could uncover hydrocarbon-contaminated soils, given the fact that refining, storage and distribution of petroleum products have been conducted at the site over a number of years. Where appropriate, the soil will be recycled as a non-hazardous waste at the American Remedial Technologies facility in Lynwood, California, or a similar facility.

TABLE 15

LOS ANGELES COUNTY NON-HAZARDOUS LANDFILL STATUS

FACILITY NAME	PERMITTED tons/day	2000 Average tons/day	Remaining Permitted Capacity (tons)	Notes
Antelope Valley I	1,800	533	8,720,000	
Azusa	6,500	610	27,000,000	See footnote (1)
Bradley Canyon	10,000	7,508	3,100,000	
Chiquita Canyon	6,000	1,243	11,820,000	
Lancaster	1,700	496	14,370,000	
Pebbly Beach	49	9	170,000	
Puente Hills	13,200	11,686	9,650,000	See footnote (2)
Sunshine	6,600	4,762	8,780,000	

Sources: Los Angeles County Department of Public Works, 2001

(1) Facility only accepts inert waste.

(3) Origin of waste limited to all jurisdictions except Orange County and the portion of the City of Los Angeles outside the jurisdictional boundary of the County Sanitation Districts.

During operation, the proposed project is not expected to generate significant quantities of solid waste, which are primarily generated from administrative or office activities. The proposed project would only result in an increase of about nine employees at the Refinery on a permanent basis so no significant increase in solid waste is expected. The disposal of demolition waste and contaminated soils would contribute to the diminishing available landfill capacity. However, sufficient landfill capacity currently exists to handle these materials on a one-time basis. The construction impacts of the project on waste treatment/disposal facilities are expected to be less than significant.

16. b) Hazardous Waste

There are no hazardous waste disposal sites within the Basin boundaries. Hazardous waste generated at area facilities, which is not reused on-site, or recycled off-site, is disposed of at a licensed in-state hazardous waste disposal facility. Two such facilities are the Chemical Waste Management Inc. (CWMI) Kettleman Hills facility in King's County, and the Safety-Kleen facility in Buttonwillow (Kern County). Kettleman Hills has an estimated 6.5 million cubic yard capacity and expects to continue receiving wastes for approximately 18 years under their current permit, or for approximately another 24 years with an approved permit modification (Personal Communication, Terry Yarbough, Chemical Waste Management Inc., June 2000). Buttonwillow receives approximately 960 tons of hazardous waste per day and has a remaining capacity of approximately 10.3 million tons. The expectant life of the Buttonwillow Landfill is

approximately 35 years (Personal Communication, Marianna Buoni, Safety-Kleen (Buttonwillow), Inc., July 2000).

Hazardous waste also can be transported to permitted facilities outside of California. The nearest out-of-state landfills are U.S. Ecology, Inc., located in Beatty, Nevada; USPCI, Inc., in Murray, Utah; and Envirosafe Services of Idaho, Inc., in Mountain Home, Idaho. Incineration is provided at the following out-of-state facilities: Aptus, located in Aragonite, Utah and Coffeyville, Kansas; Rollins Environmental Services, Inc., located in Deer Park, Texas and Baton Rouge, Louisiana; Chemical Waste Management, Inc., in Port Arthur, Texas; and Waste Research & Reclamation Co., Eau Claire, Wisconsin.

There may be an increase in the amount of hazardous waste generated during demolition of the existing hydrogen plant. There is the possibility of uncovering asbestos-containing materials. Demolition of the existing hydrogen plant is expected to result in the need to dispose of spent catalyst (about 9,170 cubic feet) and 1-methyl-2-pyrrolidinone (NMP) solution (21,000 gallons). These wastes would be characterized, treated, and disposed of or recycled offsite in accordance with applicable regulations. Catalysts are usually recycled for metal content. Excavated soil will be characterized, treated, and disposed of offsite in accordance with applicable regulations. Since there is adequate capacity at Class I landfills in California to accommodate this one time disposal, there is no anticipated significant impact associated with this waste excavation and disposal.

The facility would also generate hazardous waste from spent materials, primarily from catalysts. The catalysts have a life expectancy ranging from 6 months to 6 years, depending on the type of catalyst and reaction rate. Spent catalysts will be removed and regenerated by a catalyst company so no significant impacts are expected from the generation of hazardous waste from the new Hydrogen Plant.

The facility is expected to continue to comply with federal, state, and local statutes and regulations related to solid and hazardous wastes. No new waste streams are expected to be generated as a result of the proposed project. Chevron currently operates several hydrogen plants and the operation of the new hydrogen plant is not expected to significantly change the disposal of solid or hazardous waste from the facility. Chevron is expected to continue to comply with solid and hazardous waste regulations.

16.3 Mitigation Measures

No significant impacts to waste disposal generated or disposed of are expected and thus no mitigation measures have been proposed.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
17.0 TRANSPORTATION/TRAFFIC. Would the project:			
a) Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the	☐	☑	☐
b) volume to capacity ratio on roads, or congestion at intersections)?			
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☑
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☑
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☑
e) Result in inadequate emergency access ?	☐	☐	☑
f) Result in inadequate parking capacity?	☐	☐	☑
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g. bus turnouts, bicycle racks)?	☐	☐	☑

17.1 Significance Criteria

The impacts on transportation/traffic will be considered significant if any of the following criteria apply:

Peak period levels on major arterials are disturbed to a point where level of service (LOS) is reduced to E or F for more than one month.

An intersection's volume to capacity ratio increases by 0.02 (two percent) or more when the LOS is already D, E or F.

A major roadway is closed to all through traffic, and no alternate route is available.

There is an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.

The demand for parking facilities is substantially increased.

Water borne or rail car traffic is substantially altered.

Traffic hazards to motor vehicles, bicyclists, or pedestrians are substantially increased.

17.2 Environmental Setting and Impacts

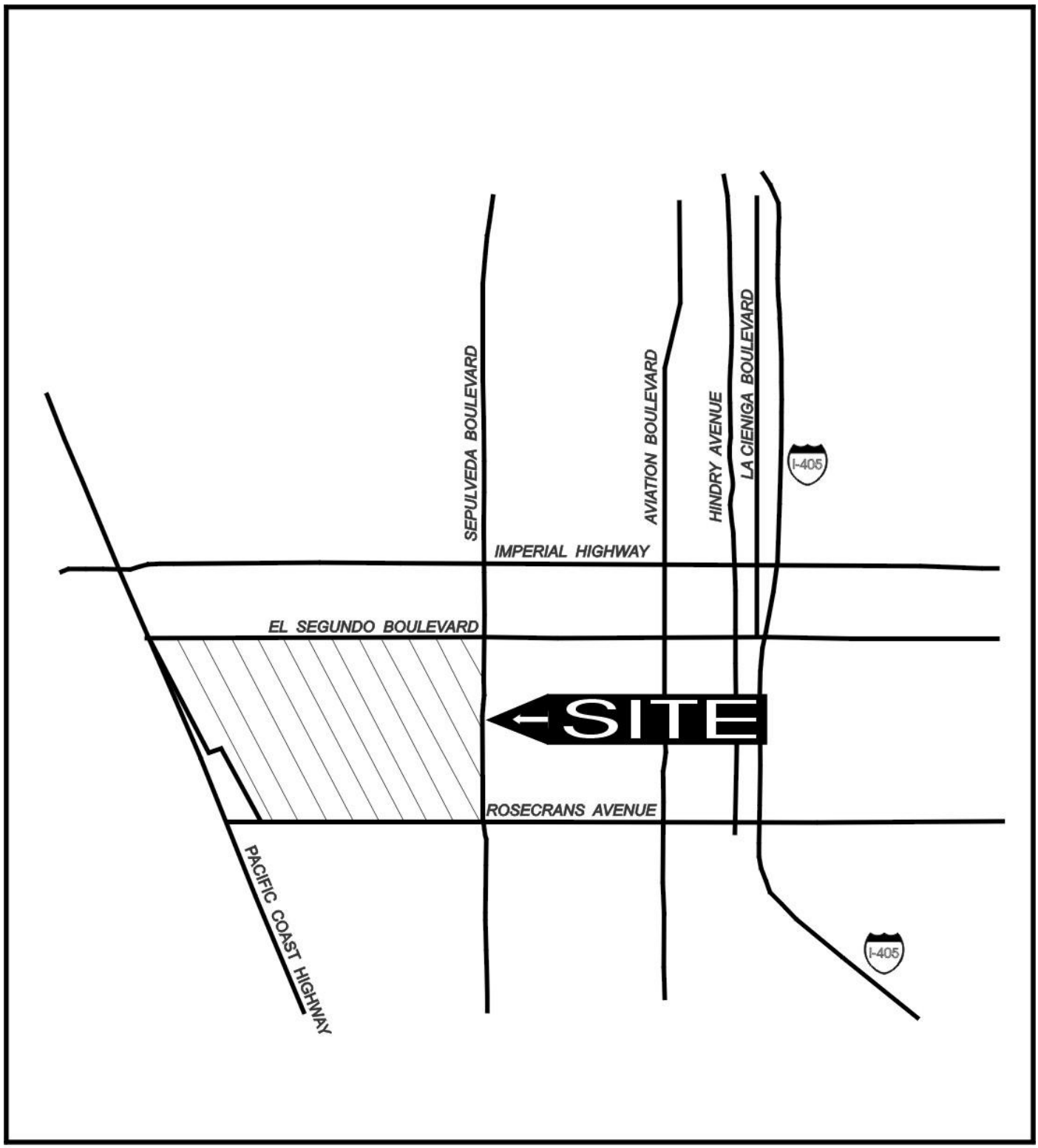
17 a) and b) Traffic and Circulation

Regional transportation facilities in the vicinity of the project are illustrated in Figure 7, and provide accessibility to the entire southern California region. The Refinery site is located west of the San Diego Freeway (Interstate 405) which provides ramp connections at El Segundo Boulevard and Rosecrans Avenue.

The following 12 intersections, including the northbound (NB) and southbound (SB) freeway ramps in the vicinity of the Refinery have been included in a traffic analysis prepared for the proposed project:

- Sepulveda Boulevard & El Segundo Boulevard,
- Sepulveda Boulevard & Rosecrans Avenue,
- Sepulveda Boulevard & Imperial Highway,
- Aviation Boulevard & El Segundo Boulevard,
- Aviation Boulevard & Rosecrans Avenue,
- La Cienega Boulevard & I-405 SB ramps,
- La Cienega Boulevard & El Segundo Boulevard,
- I-405 SB ramps & El Segundo Boulevard,
- I-405 NB ramps & El Segundo Boulevard,
- I-405 SB offramp & Rosecrans Avenue,
- I-405 NB ramps & Rosecrans Avenue, and
- Hindry Avenue & I-405 SB off-ramp/I-405 SB on-ramp.

The operating characteristics of an intersection are defined in terms of the level of service (LOS), which describes the quality of traffic flow based on variations in traffic volume and other variables such as the number of signal phases. LOS A to C operate well. Level C normally is taken as the design level in urban areas outside a regional core. Level D typically is the level for



Environmental Audit, Inc.®

N

LOCAL TRAFFIC CIRCULATION
El Segundo, California

Project No. 2184
N:\2184\Local Traffic Circulation. CDR

Figure 7

TABLE 16

LEVEL OF SERVICE ANALYSIS

	BASELINE(1) IMPACTS				IMPACTS FOR PROPOSED PROJECT					
	AM PEAK		PM PEAK		AM PEAK			PM PEAK		
INTERSECTION	Level of Service	Volume to Capacity Ratio	Level of Service	Volume to Capacity Ratio	Level of Service	Volume to Capacity Ratio	Volume to Capacity Ratio Increase	Level of Service	Volume to Capacity Ratio	Volume to Capacity Ratio Increase
Sepulveda Blvd. & El Segundo Blvd.	E	0.943	E	0.934	E	0.944	0.001	E	0.935	0.001
Sepulveda Blvd. & Rosecrans Ave.	D	0.857	E	0.997	D	0.876	0.019	F	1.015	0.018
Sepulveda Blvd. & Imperial Hwy	D	0.883	E	0.933	D	0.883	0.000	E	0.935	0.002
Aviation Blvd. & El Segundo Blvd.	F	1.139	E	0.910	F	1.139	0.000	E	0.912	0.002
Aviation Blvd. & Rosecrans Ave.	F	1.170	F	1.168	F	1.188	0.018	F	1.182	0.014
La Cienega Blvd. & I-405 SB ramps	B	0.633	A	0.539	B	0.633	0.000	A	0.539	0.000
La Cienega Blvd. & El Segundo Blvd.	B	0.686	B	0.656	B	0.686	0.000	B	0.660	0.004
I-405 SB ramps & El Segundo Blvd.	D	0.829	A	0.556	D	0.829	0.000	A	0.556	0.000
I-405 NB ramps & El Segundo Blvd.	D	0.806	C	0.711	D	0.806	0.000	C	0.714	0.003
I-405 SB offramp & Rosecrans Ave.	C	0.718	C	0.752	C	0.738	0.020	C	0.755	0.003
I-405 NB ramps & Rosecrans Ave.	B	0.646	B	0.653	B	0.665	0.019	B	0.656	0.003
Hindry Ave. & I-405 SB off/I-405 SB on	C	0.727	B	0.695	C	0.727	0.000	C	0.728	0.033

Notes: (1) Based on Year 2000 traffic counts projected to 2003 assuming a 1% per year increase in traffic.

which a metropolitan area street system is designed. Level E represents volumes at or near the capacity of the highway, which will result in possible stoppages of momentary duration and fairly unstable traffic flow. Level F occurs when a facility is overloaded and is characterized by stop-and-go (forced flow) traffic with stoppages of long duration.

Traffic counts, including turn counts, were taken to determine the existing traffic in the area. Peak hour LOS analyses were developed for intersections in the vicinity of the Refinery (see

- Table 16). The LOS analysis indicates typical urban traffic conditions in the area surrounding the Chevron Refinery and congestion at certain intersections during peak hour conditions. The intersections of Sepulveda Boulevard/El Segundo Boulevard, Sepulveda Boulevard/Rosecrans Avenue, Sepulveda Boulevard/Imperial Highway, Aviation Boulevard/El Segundo Boulevard, and Aviation Boulevard/Rosecrans Avenue operate at LOS E or F during the morning and evening peak hours. The detailed traffic analysis information is presented in Appendix D

- Sepulveda Boulevard & Imperial Highway,
- Aviation Boulevard & El Segundo Boulevard,
- Aviation Boulevard & Rosecrans Avenue,
- La Cienega Boulevard & I-405 SB ramps,
- La Cienega Boulevard & El Segundo Boulevard,
- I-405 SB ramps & El Segundo Boulevard,
- I-405 NB ramps & El Segundo Boulevard,
- I-405 SB offramp & Rosecrans Avenue,
- I-405 NB ramps & Rosecrans Avenue, and
- Hindry Avenue & I-405 SB off-ramp/I-405 SB on-ramp.

Construction and modification (excluding demolition) of the proposed project at the Refinery is expected to take about 12 months. During that time, the LOS analysis assumes about 213 construction workers will be commuting to the Refinery, during peak construction activities. All construction workers will be directed to the Refinery for parking since sufficient parking is available at the Refinery. The LOS analysis assumes that each construction worker drives to the site, which is a conservative assumption. The construction company that builds these types of facilities indicates that, based on data from other construction projects, they achieve an average vehicle ridership (AVR) of 1.3 during the construction phase of these projects.

It is estimated that a maximum of four construction trucks will travel to the site during the peak construction day to transport the construction equipment, process equipment, and construction materials to the site. It is anticipated that project construction will include eight-hour shifts per day for five days per week, Monday through Friday, with shifts running from 7:00 am to 5:00 p.m.

Table 16 shows the predicted proposed project LOS analysis and volume to capacity ratios due to peak construction activities (see Appendix D for the complete traffic analysis). This table indicates that one intersection (Hindry Avenue/I-405 ramps) shows a change in the LOS from B to C during the evening peak hour due to the construction phase of the proposed project. The traffic change at this intersection is not considered a significant impact since free-flowing traffic would continue and no significance criteria are exceeded. No change in the LOS is predicted for any other intersections so that no significant adverse impacts on traffic are expected. The construction traffic would result in traffic increases at several intersections with existing heavy traffic flow including Sepulveda Boulevard/Rosecrans Avenue and Aviation Boulevard/Rosecrans Avenue. The proposed project increased traffic is expected to be less than two percent of the peak hour traffic, which is less than significant. The project traffic at the intersection of Hindry Avenue and I-405 southbound off/on ramps is expected to increase by about 3.3 percent during the evening peak hour; however, the intersection is LOS C and the project is not expected to change the LOS at this intersection. Since free-flowing traffic would remain at this intersection (i.e., LOS C), no significant impacts are expected. Therefore, the proposed project impacts on traffic during the construction phase would be considered less than significant.

Any transport of heavy construction equipment or oversized Refinery equipment that will require oversized transport vehicles on state highways will require a Caltrans Transportation permit.

Construction will require contractor parking areas, equipment laydown and materials stockpiling areas. Parking for project construction will be in areas within the Refinery currently used for contractor parking and sufficient parking is expected to be available so no significant adverse impacts on parking are expected.

The operation of the proposed project will result in an increase in nine workers and no increase in truck traffic. Based on the above analysis of the construction traffic, an increase of nine workers would not result in significant traffic impacts. The proposed project impacts on traffic during the operational phase would be considered less than significant.

17 c) The proposed project includes modifications to existing facilities. The modifications will be similar in height and appearance as the existing hydrogen plant structures and are not expected to result in a change to air traffic patterns. The nearest airport is located about 1.5 miles north of the Refinery and outside of the normal flight pattern. In addition, the project will not involve the delivery of materials via air so no increase in air traffic is expected.

17. d) and e) The proposed project is not expected to substantially increase traffic hazards or create incompatible uses at or adjacent to the site. Truck traffic during construction will be limited to a few additional trucks per day. Traffic associated with operation of the proposed project will be limited to about nine additional workers. Emergency access at the refinery will not be impacted by the proposed project and Chevron will continue to maintain the existing emergency access gates to the Refinery.

17. f) Parking for the construction workers will be provided within the confines of the existing refinery site. The increase in permanent workers is limited to about nine new workers and sufficient parking exists at Chevron to handle the estimated nine new workers. Therefore, the proposed project will not result in significant impacts on parking.

17. g) The proposed project will be constructed within the confines of an existing refinery and is not expected to conflict with adopted policies, plans, or programs supporting alternative transportation modes (e.g., bus turnouts, bicycle racks).

17.3 Mitigation Measures

No significant impacts to transportation/traffic are expected and thus no mitigation measures have been proposed.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
18.0	**MANDATORY FINDINGS OF SIGNIFICANCE.**			
a)	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☑	☐
b)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	☐	☑	☐
c)	Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☑	☐

18. MANDATORY FINDINGS OF SIGNIFICANCE

18. a) The proposed project does not have the potential to adversely affect the environment, reduce or eliminate any plant or animal species or destroy prehistoric records of the past. The proposed project is located at a site that is part of an existing industrial facilities, which have been previously disturbed, graded and developed, and this project will not extend into environmentally sensitive areas but will remain within the confines of an existing, operating Refinery. For additional information, see Section 4.0 – Biological Resources (page 2-15) and Section 5.0 – Cultural Resources (page 2-18).

18. b) and c) The only areas where there is the potential for cumulative adverse environmental impacts are air quality and transportation/traffic. The proposed project will remove an old hydrogen plant and install a new Hydrogen Plant that complies with the current BACT requirements. Therefore, the proposed project will result in a decrease in emissions from the operation of the Chevron Refinery. Therefore, no significant air quality impacts are expected, either individually or cumulatively. Additional traffic is only expected during the one-year construction period. The construction traffic is expected to result in a peak increase of about 150

vehicles during the construction period. Traffic analyses indicate that the increased traffic at any LOS D,E or F intersection will be less than two percent of the total traffic in the area and, therefore, less than significant. An increase of about nine permanent workers is expected during operation of the project, i.e., a very minor increase. No increase in truck traffic is expected during the operation of the proposed project. No significant increase in traffic (individually or cumulatively) is expected. Therefore, the proposed project is not expected to result in significant cumulative impacts pursuant to CEQA Guidelines Section 15130(a)(2).

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ACRONYMS:

ABBREVIATION	DESCRIPTION
AB1807	California Toxic Air Contaminants Program (Tanner Bill)
AB2728	Revised Tanner Bill
AB2588	Air Toxic "Hot Spots" Information and Assessment Act
AB2595	California Clean Air Act
ACE2588	Assessment of Chemical Exposure for AB2588
API	American Petroleum Institute
ADT	Average Daily Traffic
AEL	Acute Exposure Limit
AHI	Acute Hazard Index
AHM	Acutely Hazardous Material
AQMD	Air Quality Management District
AQMP	Air Quality Management Plan
ARB	Air Resources Board
ATIR	Air Toxics Inventory Report
AVR	Average Vehicle Ridership
BACT	Best Available Control Technology
Basin	South Coast Air Basin
BLEVE	Boiling Liquid Expanding Vapor Explosion
BTU	British Thermal Units
BTU/hr	British Thermal Units per hour
C-3	General Commercial Land Use
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAAQS	California Ambient Air Quality Standards
CalARP	California Accidental Release Prevention Program
Caltrans	California Department of Transportation
CalOSHA	California Occupational Safety and Health Administration
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCR	California Code of Regulations
CEC	California Energy Commission
CEMS	Continuous Emissions Monitoring System
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHI	Chronic Hazard Index
CMP	Congestion Management Plan
CNEL	Community noise equivalent level
CNS	Central nervous system
CO	Carbon monoxide
CO_2	Carbon dioxide
CPUC	California Public Utilities Commission

CUP	Conditional Use Permit
C4	Butane
DAF	Dissolved Air Flotation
dBA	A-weighted noise level measurement in decibels
DOT	Department of Transportation
DSP	Downtown Specific Plan
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
DWR	California Department of Water Resources
EHS	Extremely Hazardous Substance
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPCRA	USEPA's Emergency Planning and Community Right-to-Know
ERPG	Emergency Response Planning Guideline
^{o}F	Degrees Fahrenheit
FCCU	Fluid Catalytic Cracking Unit
FEMA	Federal Emergency Management Agency
Ft-bgs	feet below ground surface
FHWA	Federal Highway Administration
FIP	Federal Implementation Plan
G	acceleration of gravity
GWh	Gigawatts per hour
H_2	Hydrogen
HAZOP	Hazardous operation process analysis
HI	Hazard Index
HMBP	Hazardous Materials Business Plan
HRA	Health Risk Assessment
IAF	Induced Air Flotation
ICU	Intersection Capacity Utilization
ID #	Identification number
IMO	International Maritime Organization
ISCST3	Industrial Source Complex Model Short Term Version 3
^{o}K	degrees Kelvin
LACFD	Los Angeles County Fire Department
LACSD	Los Angeles County Sanitation Districts
LADPW	Los Angeles Department of Public Works
LAER	lowest achievable emission reduction
LARWQCB	Los Angeles Regional Water Quality Control Board
LAX	Los Angeles International Airport
LEL	lower explosive limit
lbs	pounds
lbs/hr	pounds per hour
L_{dn}	day-night average sound level
L_{eq}	energy equivalent sound level
LFL	Lower Flammable Limit
Lmax	Maximum sound level

Lmin	Minimum sound level
LOS	Level of Service
LPG	liquefied petroleum gas
Lpk	Peak sound level
M-1	zone code associated with Light Manufacturing
M-2	zone code associated with Heavy Manufacturing
MACT	Maximum Achieved Control Technologies
m/s	meters per second
MATES	Multiple Air Toxic Exposure Study
MEIR	maximum exposed individual resident
MEIW	maximum exposed individual worker
MTBE	methyl tertiary butyl ether
mw	megawatts
MM	Medium Manufacturing
MMscf	Million Standard Cubic Feet
MICR	Maximum Incremental Cancer Risk
MWD	Metropolitan Water District of Southern California
N_2	nitrogen
NH_3	Ammonia
NAAQS	National Ambient Air Quality Standards
nanograms/m^3	nanograms per cubic meter
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Agency
NIOSH	National Institute of Occupational Safety and Health
NMP	Methyl-2-Pyrrolidinine Solution
NOP	Notice of Preparation
NOx	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NS	No significant impacts
NSPS	New Source Performance Standards
NSR	New Source Review
O-S	Open Space
OSHA	Occupational Safety and Health Administration
P	Parking
PAH's	Polynuclear Aromatic Hydrocarbons
PCE	passenger car equivalents
P-F	Public Facilities
pH	potential hydrogen ion concentration
PM10	particulate matter less than 10 microns in diameter
ppbv	parts per billion by volume
ppm	parts per million
ppmv	parts per million by volume
PRD	pressure relief devices
PRC	Public Resources Code
PS	Potentially Significant
PSA	Pressure Swing Technology

PSD	Prevention of Significant Deterioration
psi	pounds per square inch
psia	pounds per square inch absolute
psig	pounds per square inch (gauge)
PSM	Process Safety Management Program
R-3	Multi-Family Residential
RCPG	Regional Comprehensive Plan and Guide
RCRA	Resource Conservation and Recovery Act
RECLAIM	Regional Clean Air Incentives Market
REL	Reference exposure level
RFG	reformulated fuels gasoline
RH	High Density Residential
RM	Medium Density Residential
RMP	Risk Management Program
RMPP	Risk Management and Prevention Program
RS	Single Family Residence
RVP	Reid Vapor Pressure
RWQCB	Regional Water Quality Control Board, Los Angeles Region
S	Significant impacts even after mitigation
SB	South Bound
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison Company
SCR	Selective Catalytic Reduction
SCS	Soil Conservation Service
SMR	Steam Methane Reformer
SO_2	sulfur dioxide
SOx	sulfur oxide
SPCC	Spill Prevention, Control and Countermeasure
SRU	Sulfur Recovery Unit
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
T-BACT	Toxics Best Available Control Technology
TACs	toxic air contaminants
TDM	transportation demand management
TDS	total dissolved solids
TIMP	Transportation Improvement and Mitigation Program
TPH	total petroleum hydrocarbons
USDOT	United States Department of Transportation
U.S. EPA	United States Environmental Protection Agency
USC	United States Code
USDA	United States Department of Agriculture
USGS	United States Geological Society
ug/l	micrograms per liter
ug/m^3	micrograms per cubic meter

UVCE	Unconfined Vapor Cloud Explosion
V/C	volume to capacity ratio
VOC	volatile organic compounds
WRD	Water Replenishment District

GLOSSARY:

TERM	DEFINITION
Alkylation	The reaction of low-molecular-weight olefins with an isoparafin to produce a saturated compound of high octane number.
Alkylate	The product of an alkylation process.
Ambient Noise	The background sound of an environment in relation to which all additional sounds are heard
Anhydrous	Free from water.
Aqueous	Formed from water, having a water base.
Aromatics	Hydrocarbons which contain one or more benzene rings.
Barrel	42 gallons.
Blending	One of the final operations in refining, in which two or more different components are mixed together to obtain the desired range of properties in the finished product.
Catalyst	A substance that promotes a chemical reaction to take place but which is not itself chemically changed.
Condensate	Steam that has been condensed back into water by either raising its pressure or lowering its temperature
Cogeneration	A cogeneration unit is a unit that produces electricity.
Cracking	The process of breaking down higher molecular weight hydrocarbons to components with smaller molecular weights by the application of heat; cracking in the presence of a suitable catalyst produces an improvement in product yield and quality over simple thermal cracking.
Crude Oil	Crude oil is "unprocessed" oil which has been extracted from the subsurface. It is also known as petroleum and varies in color, from clear to tar-black, and in viscosity, from water to almost solid.
dBA	The decibel (dDB)is one tenth of a *bel* where one bel represents a difference in noise level between two intensities I_1, I_0 where

	one is ten times greater than the other. (A) indicates the measurement is weighted to the human ear.
Distillation	The process of heating a liquid to its boiling point and condensing and collecting the vapor.
Feedstock	Material used as a stream in the refining process.
Flares	Emergency equipment used to incinerate refinery gases during upset, startup, or shutdown conditions
Flue Gas	Gases produced by burning fuels in a furnace, heater or boiler.
Heat exchanger	Process equipment used to transfer heat from one medium to another.
Heater	Process equipment used to raise the temperature of refinery streams processing.
Hydrocarbon	Organic compound containing hydrogen and carbon, commonly occurring in petroleum, natural gas, and coal.
Hydrotreater	A machine that treats hydrocarbons.
Hydrotreating	A process to catalytically stabilize petroleum products of feedstocks by reacting them with hydrogen.
Isomerization	The rearrangement of straight-chain hydrocarbon molecules to form branch chain products; normal butane may be isomerized to provide a portion of the isobutane feed needed for the alkylation process.
L_{50}	Sound level exceeded 50 percentof the time (average or mean level)
Liquefied Petroleum Gas (LPG)	Liquefied light end gases often used for home heating and cooking; this gas is usually 95 percent propane, the remainder being split between ethane and butane.
MTBE	Methyl tertiary butyl ether; used in gasoline blending to meet the reformulated gasoline specifications for oxygen content; MTBE also raises the octane number of gasoline.
Naphtha	A crude distillation unit cut in the range of C_7-420^o; naphthas are subdivided – according to the actual crude distillation cuts - into light, intermediate, heavy, and very heavy virgin naphthas; a typical crude distillation operation would be:

C_7-160^o	-	light naphtha
160-280^o	-	intermediate naphtha
280-330^o	-	heavy naphtha
330-420^o	-	very heavy naphtha

Natural Gas	A mixture of hydrocarbon gases that occurs with petroleum deposits, principally methane together with varying quantities of ethane, propane, butane, and other gases.
Octane	Measurement of the burning quality of the gasoline; reflects the suitability of gasoline to perform in internal combustion engines smoothly without letting the engine knock or ping.
Olefins	Hydrocarbons that contain at least two carbons joined by double bonds; olefins do not naturally occur in crude oils but are formed during the processing.
Paleontological	Prehistoric life.
Pressure Swing Adsorption	Separates and purifies hydrogen from other gases.
Peak Hour	This typically refers to the hour during the morning (typically 7 AM to 9 AM) or the evening (typically 4 PM to 6 PM) in which the greatest number of vehicles trips are generated by a given land use or are traveling on a given roadway.
Pentane	Colorless, flammable isomeric hydrocarbon, derived from petroleum and used as a solvent.
Reactor	Vessels in which desired reactions take place.
Refinery gas	Gas produced from refinery operations used primarily for (fuel gas) combustion in refinery heaters and boilers.
Reformate	One of the products from a reformer; a reformed naptha; the naptha is then upgraded in octane by means of catalytic or thermal reforming process.
Reformulated Gasoline	New gasoline required under the federal Clean Air Act and California Air Resources Board to reduce emissions.

Reid Vapor Pressure	The vapor pressure of a product determined in a volume of air four times greater than the liquid volume at 100^{o}F; Reid vapor pressure (RVP) is an indication of the vapor-lock tendency of a motor gasoline, as well as explosion and evaporation hazards.
Seiches	A vibration of the surface of a lake or landlocked sea that varies in period from a few minutes to several hours and which many change in intensity.
Selective Catalyst Reduction	An air pollution control technology that uses a catalyst to remove nitrogen oxides from the flue gas.
Stripper or Splitter	Refinery equipment used to separate two components in a feed stream; examples include sour water strippers and naphtha splitters.

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