

# **SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**

**Final Negative Declaration for:  
Paramount Petroleum Refinery  
NOx Reduction Project**

**SCH No. 2006121043**

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## **PREFACE**

*This document constitutes the Final Negative Declaration (ND) for the Paramount Petroleum Refinery NOx Reduction Project. The Draft ND was circulated for a 30-day public review and comment period (December 12, 2006 through January 10, 2007). One comment letter was received during the public comment period. Those comments were reviewed and evaluated and are included in Appendix E of this Final ND.*

*The project includes the use of anhydrous ammonia for selective catalytic reduction (SCR) from an existing anhydrous ammonia storage tank. The use of anhydrous ammonia for the project was evaluated in the Final ND and determined not to be significant. However, anhydrous ammonia is a dense gas with toxic potential. No comments were received regarding the use of this material. SCAQMD, however, has further discussed this concern with Paramount Refinery. The operators of Paramount Refinery have informed the SCAQMD that they intend to phase out the use of anhydrous ammonia refinery-wide in favor of using aqueous ammonia. To formalize this intent, the operators of the Paramount Refinery have agreed to a permit condition that would replace anhydrous ammonia with aqueous ammonia refinery-wide by 2009.*

*Minor modifications have been made to the Draft ND such that it is now a Final MND. None of the modifications alter any conclusions reached in the Draft ND, nor provide new information of substantial importance relative to the draft document that would require recirculation of the Draft ND pursuant to CEQA Guidelines §15088.5. Therefore, this document is now a Final ND. Additions to the text of the ND are denoted using italics. Text that has been eliminated is shown using ~~strike-outs~~.*

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## **CHAPTER 1**

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### **PROJECT DESCRIPTION**

Introduction  
Agency Authority  
Project Background  
Project Location  
Overview of Current Operations  
Proposed Project  
Construction Schedule  
Required Permits



## **1.0 PROJECT DESCRIPTION**

### **1.1 INTRODUCTION**

The Paramount Petroleum Corporation (Paramount) is proposing to install one new selective catalytic reduction unit (SCR) and upgrade a second existing SCR at its Paramount Refinery to reduce nitrogen oxide (NO<sub>x</sub>) emissions existing process heaters at the Refinery. Paramount is pursuing SCR projects to satisfy the requirements of a Settlement Agreement, which is part of a Stipulated Order for Abatement with the South Coast Air Quality Management District (SCAQMD).

### **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 at the Paramount Refinery 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 adverse environmental impacts associated with the proposed project at the Paramount 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). The primary purpose of the proposed project is to comply with SCAQMD rules and regulations. 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 environmental analysis of the project shows that there is no substantial evidence that the project may have a significant effect on the environment (CEQA Guidelines §15070(a)). As shown in Chapter 2, no significant adverse impacts are expected from the proposed project and, therefore, the preparation of a negative declaration is the appropriate CEQA document.

### **1.3 PROJECT BACKGROUND**

Paramount is pursuing SCR projects to satisfy the requirements of a Settlement Agreement, which is part of a Stipulated Order for Abatement with the SCAQMD. The Settlement Agreement was signed on October 5, 2004 and includes two remaining major milestones for completion of SCR NO<sub>x</sub> reduction projects. By March 31, 2007 Paramount must install SCR on heater H-601. By March 31, 2009 Paramount must install SCR on heater H-802. The Settlement Agreement allows

for alternatives to installing SCR on H-802. Paramount is evaluating the Reformer SCR on heaters H-303, H-304, H-305, and H-306 as an alternate project to H-802 SCR.

*The project includes the use of anhydrous ammonia for selective catalytic reduction (SCR) from an existing anhydrous ammonia storage tank. The use of anhydrous ammonia for the project was evaluated in the Final ND and determined not to be significant. However, anhydrous ammonia is a dense gas with toxic potential. No comments were received regarding the use of this material. SCAQMD, however, has further discussed this concern with Paramount Refinery. The operators of Paramount Refinery have informed the SCAQMD that they intend to phase out the use of anhydrous ammonia refinery-wide in favor of using aqueous ammonia. To formalize this intent, the operators of the Paramount Refinery have agreed to a permit condition that would replace anhydrous ammonia with aqueous ammonia refinery-wide by 2009.*

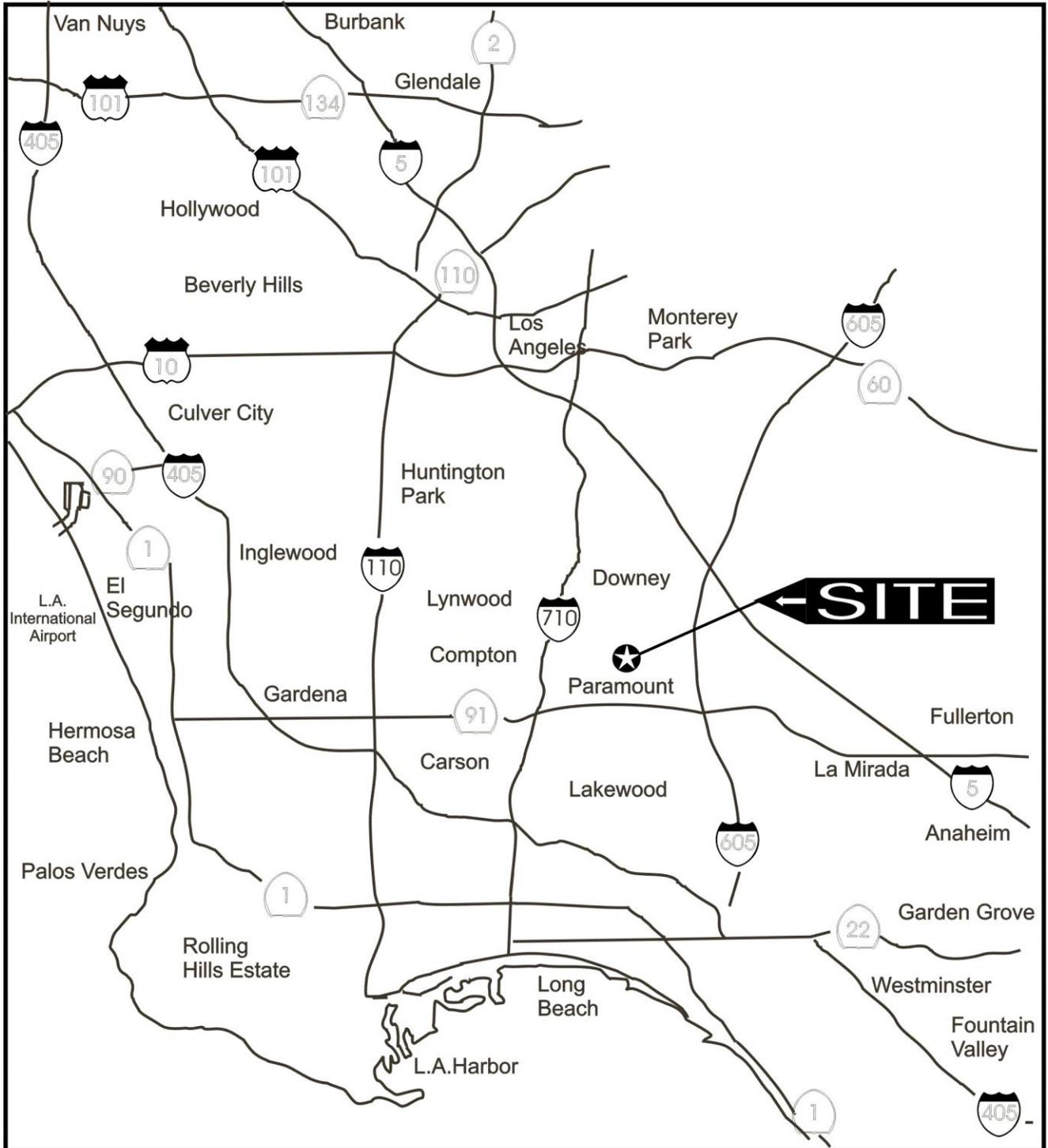
## **1.4 PROJECT LOCATION**

The Refinery is located at 14700 Downey Avenue, Paramount, California. The City is located east of the Los Angeles River and is approximately 16.5 miles southeast of downtown Los Angeles. The City of Paramount is bounded by the cities of South Gate, Downey, Bellflower, Long Beach, Compton, and Lynwood. The Refinery is bounded by Lakewood Boulevard, Somerset Boulevard, Downey Avenue, and Contreras Street. The Refinery is located immediately west of the City of Bellflower municipal boundary lines, and approximately one-quarter mile south of the City of Downey boundary line (see Figures 1 and 2).

Regional access to the Refinery is provided by Interstates 605 and 710 which run north-south approximately two-and-one quarter miles east and west of the Refinery, respectively. State Route 91 runs east-west and is located approximately two miles south of the Refinery. Interstate 105 is located about three-quarters of a mile north of the Refinery.

The Refinery accounts for slightly more than half of the total acreage within the Somerset Ranch Area of the 1990 Paramount General Plan. The Somerset Ranch Area of Paramount is designated as “Mixed Use” and includes a mix of residential, commercial, industrial, and public uses. The Refinery is zoned M-2, Heavy Manufacturing. The land use pattern varies widely in the Paramount area on a parcel by parcel basis and reflects an area in transition from a variety of older land uses (that include the Refinery) to newer development (including apartment houses and commercial land uses, e.g., grocery stores and a Walmart).

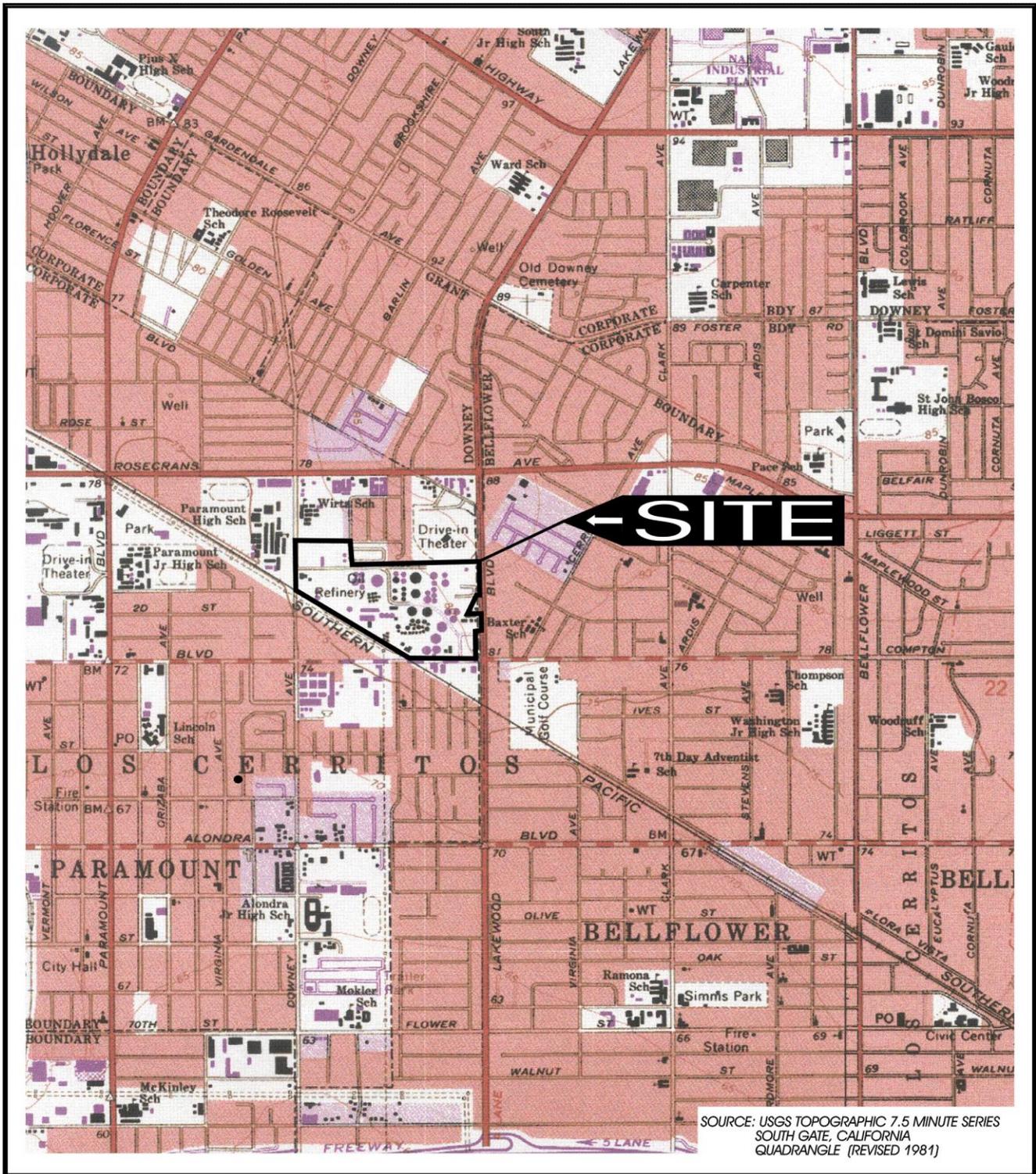
Wirtz School is located at the corner of Contreras and Downey Avenues; the Cinderella Mobile Home Community, and single-family homes are located further east along Contreras Avenue. The two parcels northeast of the site have been developed with commercial uses, e.g. Albertson’s and Walmart. The Baxter School is located east of Lakewood Boulevard in the City of Bellflower. The east side of Lakewood Boulevard is developed with commercial uses, including several auto-related uses, the Rainbow Trailer Park, Fox Trailer Court, and the Hazy 8 Motel. The Los Angeles Department of Water and Power easement and the UPRR tracks run diagonally across Somerset Boulevard and Downey Avenue and separate the Refinery from the Somerset Village condominiums and a neighborhood that consists of single-family dwellings. Further south along



REGIONAL MAP



Paramount Refinery – NOx Reduction Project



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SITE LOCATION MAP  
14700 Downey Avenue  
Paramount, California

Project No. 2402  
N:\2402\Site Location Map (Fig.2).cdr

Figure 2

Somerset Boulevard, there are single-family neighborhoods and commercial and industrial land uses. The opposite side of Downey Avenue contains a mix of single- and multiple-family developments and Paramount High School.

Primary truck access to the Refinery is provided by Andry Drive, which is accessible from Somerset and Lakewood Boulevards. The main entrance to the administrative offices at the Refinery is at Downey Avenue. Lakewood Boulevard serves as the City's eastern boundary for both the City and project site. Somerset Boulevard and Downey Avenue, two of the City's major thoroughfares, define the southern and western edges of the project site. The Los Angeles Department of Water and Power (DWP) easement and the Union Pacific railroad (UPRR) separate the Refinery from multiple-family residential uses to the southwest.

### 1.5 OVERVIEW OF CURRENT OPERATIONS

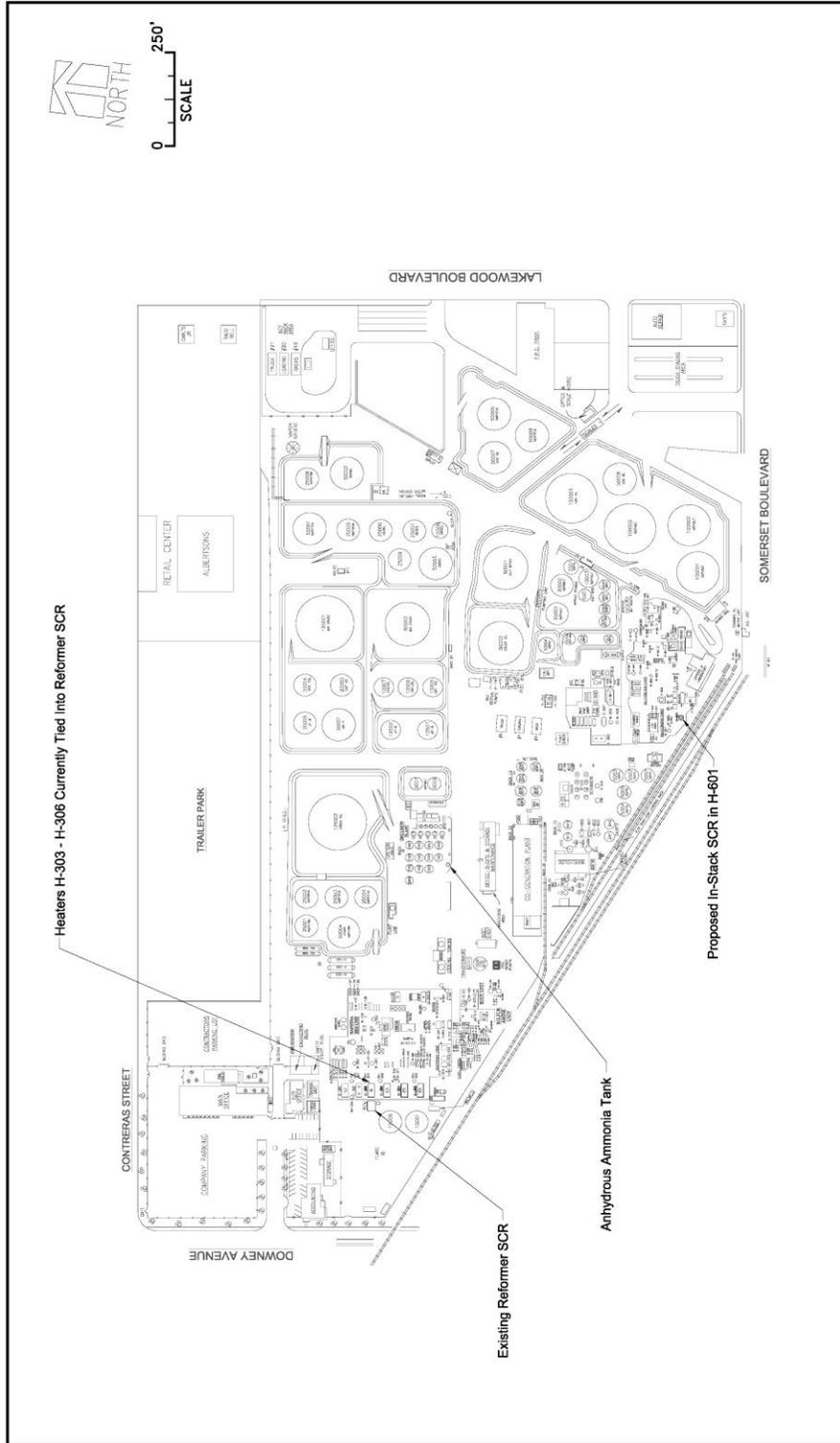
The Paramount Refinery produces a variety of products including gasoline, jet fuel, diesel fuel, petroleum gases, sulfuric acid, and sulfur from crude oil. Crude oil is a mixture of hydrocarbon compounds and relatively small amounts of other materials, such as oxygen, nitrogen, sulfur, salt, and water. Petroleum refining is a coordinated arrangement of manufacturing processes designed to produce physical and chemical changes in 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 for use in marketable products; and (4) chemically combining two or more hydrocarbons to produce high-grade gasoline.

The refining process produces emissions of air pollutants, including oxides of nitrogen (NO<sub>x</sub>), the pollutant that would be reduced as a result of the proposed project. NO<sub>x</sub> emissions reported for 2005 were 112 tons per year, although NO<sub>x</sub> emissions vary from year to year. Various emission reduction equipment and operating strategies are used to control emissions from the Refinery to comply with stringent SCAQMD rules and regulations.

### 1.6 PROPOSED PROJECT

The Paramount Petroleum Refinery is proposing to upgrade its facility in order to further reduce NO<sub>x</sub> emissions. Currently, two different SCR system upgrades are being proposed: 1) installation of a new SCR unit on an existing Heater (H-601); and 2) upgrade an existing SCR unit that currently services four existing heaters (H-303, H-304, H-305, and H-306) to provide additional NO<sub>x</sub> reductions. These modifications are described in detail in the following subsections. The location of the proposed project modifications are shown in Figure 3.

*The proposed project includes the use of anhydrous ammonia for selective catalytic reduction (SCR) from an existing anhydrous ammonia storage tank. The operators of Paramount Refinery have informed the SCAQMD that they will phase out the use of anhydrous ammonia refinery-wide*



REFINERY LAYOUT AND LOCATION OF PROCESS UNITS

Figure 3

Project No. 2402  
15502/Refinery Layout (Fig. 3 Rev.2)

*in favor of using aqueous ammonia. To formalize this intent, the operators of the Paramount Refinery have agreed to a permit condition that would replace anhydrous ammonia with aqueous ammonia refinery-wide by 2009.*

SCR units are considered to be best available retrofit control technology (BARCT) for the control of NO<sub>x</sub> from existing combustion sources. NO<sub>x</sub> emissions are controlled by injecting ammonia into the exhaust gas stream upstream of a catalyst. The ammonia will be anhydrous ammonia for the proposed project. NO<sub>x</sub>, ammonia, and oxygen react on the surface of the catalyst to form nitrogen and water. The catalyst typically is made from exotic metal oxides. SCR units can achieve NO<sub>x</sub> control efficiencies of approximately 90 percent or more.

### **1.6.1 NEW SCR UNIT ON EXISTING HEATER**

Paramount will install a new in-stack SCR unit on existing Heater 601 to reduce NO<sub>x</sub> emissions. Due to the limited plot space around Heater 601 (H-601), a low pressure drop SCR mounted above the heater's convection section is proposed. The overall heater stack height will be increased by about 55 feet to about 156 feet, ten inches, to accommodate the in-stack SCR for H-601. H-601 has a maximum fired rate of about 85 million British Thermal Units per hour (mmBtu/hr) and was retrofitted in early 2005 with ultra low NO<sub>x</sub> burners. The current NO<sub>x</sub> emission rate from H-601 is about 15 parts per million (ppm). The addition of an SCR unit will reduce the NO<sub>x</sub> emissions to no more than five ppm.

The ammonia to be used in the new SCR unit for H-601 will be supplied from an existing anhydrous ammonia storage tank, so no new storage tank will be required, and there will be no increase in the quantity of anhydrous ammonia stored on site. The new SCR unit is expected to use about 1.73 pounds per hour of ammonia (about 250 gallons per month). Additional piping will be installed to transport ammonia from the existing storage tank to the new SCR. In addition, no physical modifications are required to the existing storage tank. The annual throughput of the existing anhydrous ammonia tank will increase slightly, but there will be no increase in ammonia emissions because the tank is pressurized with a vapor balanced system for filling.

### **1.6.2 UPGRADE EXISTING SCR UNIT**

Paramount is proposing to upgrade an existing SCR unit that currently controls emissions from the Reformer Heaters (H-303, H-304, H-305, and H-306). The exhaust streams from all four boilers are vented to the existing SCR unit. The proposed upgrade involves redesigning the existing SCR reactor and internal configuration in order to be more efficient and provide greater NO<sub>x</sub> emission reductions. NO<sub>x</sub> emissions from all four heaters using the existing SCR unit are about 25 ppm. Under the proposed upgrade, a larger catalyst module will be incorporated into the existing SCR unit and additional catalyst will be added in order to obtain additional NO<sub>x</sub> emission reductions. The design will allow all four heaters to operate at the permitted firing rate of 163 mmBtu/hr, with six percent oxygen in the flue gas, on a dry basis, and an outlet NO<sub>x</sub> emissions rate of five ppm.

Ammonia from the existing Ammonia Flow Control Unit (AFCU) will be introduced into the flue gas stream through the ammonia injection grid (AIG). The existing stack, induced draft fan, and inter-connecting ducting will be re-used, as will the existing piping from the ammonia tank. The

new SCR reactor cross sectional area will be larger than the existing one, however, the new reactor height will remain the same.

The modified SCR system will continue to use anhydrous ammonia from an existing ammonia storage tank, so no new storage tank or additional piping will be required. In addition, no physical modification is required to the existing storage tank. The annual throughput of the existing anhydrous ammonia tank will increase slightly, but there will be no increase in ammonia emissions because the tank is pressurized with a vapor balanced system for filling. Paramount currently uses about 1.87 pound per hour (about 270 gallons per month) of ammonia in the existing SCR unit for the Reformer Heaters. The upgraded SCR unit is expected to require 4.43 pounds per hour (about 640 gallons per month).

## **1.7 CONSTRUCTION SCHEDULE**

Paramount estimates that construction activities will require about two to three months to complete the construction phase. Paramount will begin construction activities as soon as the permits for the proposed project are issued and expects to complete construction by the end of the first quarter of 2007. The replacement of the existing SCR on the Reformer Heaters is expected to occur sometime between late 2007 and March 30, 2009, however, the schedule is subject to change.

## **1.8 REQUIRED PERMITS**

The proposed project will require Permits to Construct/Operate from the SCAQMD and may require building permits from the City of Paramount. No other permits are expected to be required.