

## **CHAPTER 6**

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### **ALTERNATIVES**

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## 6.0 PROJECT ALTERNATIVES

### 6.1 INTRODUCTION

Chapter 6 provides a discussion of alternatives to the proposed project as required by CEQA. According to the CEQA guidelines, alternatives should include realistic measures to attain the basic objectives of the proposed project and provide means for evaluating the comparative merits of each alternative. In addition, though the range of alternatives must be sufficient to permit a reasoned choice, they need not include every conceivable project alternative (CEQA Guidelines, §15126.6(a)). The key issue is whether the selection and discussion of alternatives fosters informed decision making and public participation.

Alternatives presented in this chapter were developed by identifying alternatives achieving most or some of the objectives of the proposed project. Consequently, each project alternative described below is similar to the proposed project in most respects. The rationale for selecting specific components of the proposed project on which to focus the alternatives analysis rests on CEQA's requirements to present a range of reasonable project alternatives that could feasibly attain the basic objectives of the project, while generating fewer or less severe adverse environmental impacts. The objectives of the proposed project are as follows:

- Improve the energy efficiency, performance, and reliability of process units;
- Allow the Refinery to efficiently and reliably process a wider range of crude oils, including higher sulfur-containing crude oils;
- Produce low-sulfur fuel products and increase production of commercial grade elemental sulfur;
- Improve the management of blending components of CARB fuels; and,
- Reduce the potential for atmospheric releases and related emissions from PRDs in the No. 2 Crude Unit, No. 2 RSU, and the Minalk/Merox Unit.

The proposed project involves modifications to a number of different units. The alternatives presented in this chapter include modifications to aspects of the specific equipment or operations of the proposed project that would still allow the Refinery to meet some or most of the project objectives.

Section 15126.6(f) of the CEQA Guidelines stipulates that the range of alternatives required in an EIR is governed by a rule of reason in that the EIR must discuss only those alternatives "necessary to permit a reasoned choice" and those that could feasibly attain most of the basic objectives of the proposed project.

The project alternatives were developed by modifying one or more components of the proposed project taking into consideration the project's limitations as to space, permitting requirements, and compliance agreement stipulations. Unless otherwise stated, all other components of each project alternative are identical to the proposed project. The identified feasible project alternatives as well as the alternatives rejected as infeasible are discussed further below.

Aside from the alternatives described below, no other project alternatives were identified that met most of the objectives of the proposed project, while substantially reducing significant adverse environmental impacts.

## 6.2 ALTERNATIVES REJECTED AS INFEASIBLE

In accordance with CEQA Guidelines §15126.6(c), a CEQA document should identify any alternatives that were considered by the lead agency, but were rejected as infeasible during the scoping process and briefly explain the reason underlying the lead agency's determination.

Section 15126.6(c) also states that among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (1) failure to meet most of the basic project objectives; (2) infeasibility; or (3) inability to avoid significant environmental impacts. Furthermore, CEQA Guidelines §15126.6(f)(2)(B) indicates that if the lead agency concludes that no feasible alternative locations for the project exist, it must disclose the reasons for this conclusion, and should include the reasons in the EIR.

**EMx Technology Instead of SCR:** The proposed project includes the installation of an SCR unit to control NO<sub>x</sub> emissions from the new Cogeneration Unit. The use of SCR is considered BACT for the control of NO<sub>x</sub> emissions from electrical generating equipment. A new air pollution control technology, the EMx Catalytic Absorption System, is being used in one cogeneration facility located in Redding, California for the control of NO<sub>x</sub>, CO, VOC, and PM<sub>10</sub> emissions and is considered a potential alternative to the use of SCR.

The EMx control system is a post-combustion multi-pollutant control technology developed by EmeraChem LLC. EMx uses a single catalyst to remove NO<sub>x</sub>, CO, and VOC emissions in turbine exhaust gas by oxidizing nitrogen oxide (NO) to NO<sub>2</sub>, CO to carbon dioxide, and hydrocarbons to carbon dioxide and water, and then adsorbing NO<sub>2</sub> onto the catalytic surface using a potassium carbonate absorber coating. The potassium carbonate coating reacts with NO<sub>2</sub> to form potassium nitrites and nitrates, which are deposited onto the catalyst surface.

When all of the potassium carbonate absorber coating has been converted to nitrogen compounds, NO<sub>x</sub> can no longer be absorbed and the catalyst must be regenerated. Regeneration is accomplished by passing a dilute hydrogen gas across the surface of the catalyst in the absence of oxygen. Hydrogen in the gas reacts with the nitrites and

nitrites to form water and molecular nitrogen. Carbon dioxide in the gas reacts with the potassium nitrite and nitrites to form potassium carbonate, which is the absorbing surface coating on the catalyst. The EMx catalyst is sensitive to contamination of sulfur in combustion fuel. Therefore, an ESx catalyst is provided in conjunction with the EMx system to remove sulfur compounds from the gas turbine exhaust stream. The SCAQMD considers the EMx catalyst BACT. Therefore, Chevron has the option of choosing either the EMx or SCR systems.

The Cogeneration Unit at the Chevron Refinery will run on refinery fuel gas and/or natural gas, so Chevron operators are concerned that the sulfur content of the fuel may not be compatible with the EMx catalyst which may interfere with its ability to consistently comply with BACT NOx requirements. In addition, although the EMx Technology does not use ammonia, it results in an increase in water use and wastewater discharge, and requires a hydrogen supply, which may generate other environmental impacts, including increased GHG emissions. Therefore, the use of the SCR is considered to be preferable over the EMx technology for the specific application at the Chevron Refinery.

**Alternative Sites:** The Refinery has limited space for new units. The new Cogeneration Unit, new SRU and TGU, new PSA Unit, new SWS, new cooling tower, and new tanks and their supporting infrastructure require significant plot space. Alternate sites within the Refinery are not feasible because:

- There is not enough plot space elsewhere in the Refinery where the equipment and supporting infrastructure can be located.
- If the SRU, TGU, and SWS were sited in different locations in the Refinery, either there is not sufficient space within the Refinery or extensive modifications would be required to the surrounding facilities to meet current code and safety requirements.
- Separate sites would require more equipment to connect processes, and consequently, would result in additional construction and fugitive emissions.

An alternative location to the Chevron Refinery site is also not feasible as the proposed project consists of modifications to an existing Refinery that contains necessary processing units; natural gas, water, and electric transmission infrastructures; crude oil and petroleum product transportation infrastructure; and the appropriate land use designation necessary to support the project. Advantages of the existing Refinery site would be lost if another location were proposed. The development of a new refinery in an alternative location would require substantially more equipment, construction, and potentially generate substantially greater impacts in many environmental categories (e.g., air quality, energy, noise, traffic, and hazards) than the proposed project. Therefore, an alternative refinery site for the proposed project is not feasible.

## **6.3 DESCRIPTION OF THE PROJECT ALTERNATIVES**

### **6.3.1 ALTERNATIVE 1 – NO PROJECT ALTERNATIVE**

CEQA Guidelines §15126.6 (e) require evaluation of a “No Project Alternative”. Under the “No Project Alternative,” no Refinery modifications would occur. The proposed modifications to the FCCU, Alkylation Unit, VRDS, ISOMAX Unit, Cogen Unit, Railcar Loading/Unloading Rack, connection of atmospheric PRDs in the No. 2 Crude Unit, No. 2 RSU, Minalk/Merox Unit to a closed vent system, and utility improvements would not occur. In addition, the proposed new SRU, SWS, TGU, vapor recovery and safety flare system, storage tanks, cooling tower, PSA Unit, and hydrogen compression and transfer facilities would not be built and the Refinery would continue to operate under its current configuration.

The “No Project Alternative” would not meet the objectives of the proposed project which include: (1) processing of higher sulfur crude oils; (2) producing additional lower sulfur fuel and other sulfur products; (3) improving efficiency, performance and reliability of process units; and (4) reducing emissions from PRDs in specified units.

### **6.3.2 ALTERNATIVE 2 – NO ADDITIONAL SULFUR RECOVERY FACILITIES**

Under Alternative 2, the project as described in Chapter 2 would be constructed with the exception of the Sulfur Recovery facilities, including the SWS, SRU and TGU. All other portions of the proposed project would still be included. This would preclude achieving several major objectives of the PRO Project, namely:

- 1) The Refinery’s ability to process higher sulfur crude oils and recover incremental sulfur for commercial sale would not be augmented.
- 2) The Refinery’s ability to produce additional low sulfur fuel products would be compromised.
- 3) The reliability of Refinery sulfur processing would not be improved because there would be no increase in the number of parallel sulfur processing units.

### **6.3.3 ALTERNATIVE 3 – ELIMINATE VAPOR RECOVERY AND SAFETY FLARE SYSTEM**

Under Alternative 3, the project as described in Chapter 2 would be constructed with the exception of the Vapor Recovery and Safety Flare System. This is a voluntary Refinery modification that is being proposed to eliminate the potential for venting of PRDs to the atmosphere, thus, minimizing Refinery VOC emissions. Alternative 3 would allow the Refinery to achieve the project objectives of: (1) processing of higher sulfur crude oils; (2) producing lower sulfur fuel and other sulfur products; and (3) improving efficiency,

performance and reliability of process units. However, Alternative 3 would not allow the Refinery to further control the potential atmospheric releases and related emissions from PRDs in specified units, potentially in violation of SCAQMD Rule 1173.

#### **6.3.4 ALTERNATIVE 4 – ELIMINATE FCCU AND ALKYLATION UNIT MODIFICATIONS**

Under the proposed project, modifications to the Refinery are proposed that would increase the recovery of additional LPG and other intermediate streams from existing Refinery operations that would allow the production of additional CARB gasoline. Specifically, the proposed project includes modifications to the FCCU, including the installation of a new main air blower, a new depropanizer column (replacing three smaller distillation columns), a new deethanizer column, new pumps, and new heat exchangers. The modifications to the Alkylation Unit includes supplemental cooling, additional heat exchangers, and the removal of a depropanizer, which is one of the three depropanizers being removed and replaced by one new depropanizer in the FCCU. Under Alternative 4, the modifications to the FCCU and Alkylation Unit would not occur and the objective related to increasing the recovery of additional LPG and other intermediate streams, which have economic value and contribute to producing CARB fuels, from the fuel gas system would also not occur.

#### **6.3.5 ALTERNATIVE 5 – ELIMINATE THE NEW 49.9 MW COGENERATION UNIT**

The proposed project includes the construction of a new 49.9 MW Cogeneration unit to decrease the Refinery's need to purchase electricity from off-site sources. Alternative 5 would eliminate the new Cogeneration Unit and the required additional electricity demand would be supplied by the local utility company. Under Alternative 5, a new auxiliary boiler would be required to supply the necessary amount of steam demand of the proposed new and modified units. Like the cogeneration unit, the new boiler would likely require installation of SCR as BACT for the boiler's combustion source.

### **6.4 ENVIRONMENTAL IMPACTS FROM THE PROJECT ALTERNATIVES**

#### **6.4.1 ALTERNATIVE 1 – NO PROJECT ALTERNATIVE**

**Air Quality:** Air quality impacts associated with construction of the proposed project would be eliminated (see Table 4-3) under Alternative 1 because no construction activities would be required. Construction emissions associated with the proposed project were considered significant for CO, VOC, NO<sub>x</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub>. Under Alternative 1, air quality impacts from construction would be less than significant for all pollutants.

The emissions associated with the operational phase of Alternative 1 would be less than the proposed project since no new or modified units are required under Alternative 1. Therefore, the operational emissions impact of the proposed project would be eliminated. While the No Project Alternative would eliminate all emission increases it would also eliminate all emission benefits (e.g., reduced emissions due reduced venting of PRDs to the atmosphere and installation of low NO<sub>x</sub> burners on the ISOMAX heaters) associated with the proposed project during the operational phase. The operational emissions from the proposed project were considered to be less than significant after mitigation. Consequently, Alternative 1 would also result in no significant operational air quality impacts.

Alternative 1 would eliminate the increased TAC emissions and the associated health risks. The health risks from the proposed project (both carcinogenic and non-carcinogenic) were considered to be less than significant.

**Energy:** The No Project Alternative would not change the amount of electricity currently required by the Refinery. The proposed project is estimated to require about 29.9 MW of additional electricity, which would not be necessary under Alternative 1. The proposed project includes the construction of a cogeneration plant that would generate about 49.9 MW of electricity. Therefore, Alternative 1 would result in less electrical demand, but would not allow the Refinery to produce most of its own electricity requiring the continued purchase of electricity from off-site providers.

Alternative 1 would not allow Chevron to increase the production of clean fuels and ULSD, eliminating the beneficial energy impacts provided by the proposed project of producing additional quantities of low emission commercial fuels.

**Hazards:** The No Project Alternative would eliminate the hazards associated with the proposed project. However, the hazard impacts associated with the proposed project are considered to be less than significant. The potential hazards are confined to the Refinery, or would not create new hazards that would extend off-site. Therefore, the hazard impacts from Alternative 1 would not be significant.

The No Project Alternative is not expected to change the amount of hazardous materials transported to or from the Refinery. Therefore, no increase in transportation hazards is expected from the No Project Alternative. The proposed project is expected to eliminate five ammonia truck trips that transport ammonia to customers. Under the No Project Alternative, these five ammonia truck trips would continue to occur.

**Hydrology/Water Quality:** The No Project Alternative would eliminate the increase in water use and wastewater discharge associated with the proposed project. The proposed project is expected to result in an increase in water demand of about 520 gpm or about 748,800 gpd. The proposed project would include modifications at the Hyperion Wastewater Treatment Plant to allow the increased production of reclaimed water for

cooling tower purposes and boiler feed water so no significant increase in water demand impacts are expected from the proposed project.

The No Project Alternative would eliminate the potential increase in wastewater generated from the proposed project of about 223,200 gpd. The wastewater treatment systems at the Refinery have adequate capacity to handle the increase in wastewater so that wastewater impacts from the proposed project are expected to be less than significant. Nonetheless, Alternative 1 would eliminate any increase in wastewater associated with the proposed project.

**Noise:** The No Project Alternative would eliminate the increase in noise during both the construction and operational phases. The proposed project is expected to increase the noise levels at the Refinery due to operation of construction equipment and new Refinery equipment. The increased noise levels associated with the proposed project were considered less than significant during both the construction and operational phase of the proposed project as no noticeable noise increase is expected. Implementation of the No Project Alternative would eliminate the potential noise impacts and the impacts would remain at current levels.

**Solid/Hazardous Waste:** The proposed project impacts on the generation of both non-hazardous and hazardous wastes were considered to be less than significant. The No Project Alternative would eliminate the generation of non-hazardous and hazardous wastes during both construction and operation since the proposed project would not be built.

**Traffic/Transportation:** The No Project Alternative would eliminate traffic associated with construction activities since no portion of the proposed project would be constructed. The construction traffic impacts associated with the proposed project are considered to be significant, and mitigation measures are not expected to reduce the traffic impacts to less than significant. The No Project Alternative would eliminate traffic impacts as no construction activities would be required. The proposed project impacts on traffic during the operational phase were considered to be less than significant and they would remain at current levels under Alternative 1. The No Project Alternative would eliminate construction traffic impacts associated with the proposed project.

#### **6.4.2 ALTERNATIVE 2 – NO ADDITIONAL SULFUR RECOVERY FACILITIES**

**Air Quality:** Alternative 2 would eliminate the construction of the Sulfur Recovery facilities including the SWS, SRU, and TGU. Alternative 2 would result in a decrease in construction emissions from less workers and less equipment installation since sulfur recovery facilities would not be built; however, the major portions of the proposed project would still be built. The construction emissions under Alternative 2 are expected to remain significant.

Under Alternative 2, the operational emissions are expected to be less than the proposed project since the SWS, SRU, and TGU would not be built. However, Alternative 2 would prevent the Refinery from converting ammonia into atmospheric nitrogen and water and require the ammonia to be recovered in the ammonia plant, therefore, the refinery would maintain their existing level of ammonia for sale. Thus, Alternative 2 would result in an increase in truck emissions to transport aqueous ammonia from the Refinery, as compared to the proposed project. Overall, Alternative 2 is not expected to significantly alter the operational emissions associated with the Refinery operations and operational emissions are expected to remain less than significant.

Alternative 2 would eliminate the increased TAC emissions associated with the Sulfur Recovery facilities (mainly H<sub>2</sub>S and carbonyl sulfide) and the associated health risks. The health risks associated with the proposed project (both carcinogenic and non-carcinogenic) were considered to be less than significant and the health risks would remain less than significant under Alternative 2.

**Energy:** Under Alternative 2, the Cogen Train D and related facilities would still be installed and the sulfur recovery facilities do not require any substantial use of electricity. Therefore, the impacts of Alternative 2 on energy resources are expected to be essentially the same as the proposed project and less than significant.

**Hazards:** The proposed project impacts on hazards are expected to be less than significant. Under Alternative 2, the Sulfur Recovery facilities, that would allow Chevron to use ammonia as a fuel source, would not be built so that Chevron would maintain their current level of ammonia production and transport. Therefore, the hazard impacts under Alternative 2 are expected to be greater than the proposed project because more ammonia will be handled, stored and transported from the Refinery's aqueous ammonia production equipment, resulting in potentially higher transportation risks associated with ammonia than the proposed project. In comparison, the proposed project would reduce the handling, storage and subsequent transport of ammonia because ammonia would be used as a fuel source in the Sulfur Recovery facilities.

**Hydrology/Water Quality:** The proposed project impacts on hydrology and water quality are expected to be less than significant. Alternative 2 would not change the amount of wastewater generated by the Refinery. Sour water production from the CKN reactors at the ISOMAX would still increase by about 15 gpm and this water would be processed in the existing SWSs (which produce stripped sour water to the segregated drainage system) rather than in the proposed stripper. The hydrology and water quality impacts associated with Alternative 2 are considered to be less than significant and equivalent to the proposed project.

**Noise:** The proposed project is expected to increase the noise levels at the Refinery due to operation of construction equipment and new Refinery equipment. The increased noise levels associated with the proposed project were considered less than significant during both the construction and operational phases of the proposed project as no noticeable

noise increase offsite is expected. Implementation of Alternative 2 is expected to require less construction activities than the proposed project because fewer Refinery units would be constructed, so noise impacts are expected to be less than the proposed project and, therefore, less than significant.

Operational noise impacts associated with Alternative 2 are expected to be less than the proposed project as the pumps and compressors associated with the Sulfur Recovery facilities, including the SWS, SRU, and TGU would not be installed at the Refinery. However, other major noise generating sources included as part of the project are:

- The new equipment associated with the Cogen Train D;
- New pumps and compressors associated with the ISOMAX Unit; and
- New pumps compressors associated with the vapor recovery system.

Alternative 2 would eliminate the new pumps and motors associated with the Sulfur Recovery facilities. The noise-generating equipment associated with other equipment would still be installed. The location of the new equipment is a sufficient distance from offsite sensitive receptors so that noise impacts under Alternative 2 are expected to remain less than significant and slightly less than the proposed project.

**Solid/Hazardous Waste:** The proposed project impacts on solid/hazardous waste are expected to be less than significant during both the construction and operational phases. Alternative 2 would eliminate the construction of the Sulfur Recovery facilities so the construction of the foundations and the related grading would not be required. Therefore, there could be a decrease in the amount of contaminated soil that would require removal. Alternative 2 is not expected to significantly alter the estimated generation of hazardous waste generated by the proposed project during the operational phases. Alternative 2 would eliminate the SRU/TGU catalyst use and decrease the potential volume of catalyst that would require recycling. The amount of catalyst that may be used in the SRU/TGU is currently unknown. Under Alternative 2, modifications to the ISOMAX Unit would still occur and Cogen Train D would still be installed; therefore, the catalyst use and related waste would still be generated. Used catalyst is expected to be sent to recycling facilities for recovery of heavy metals, so no increase in waste disposal of catalyst is expected. Therefore, the solid/hazardous waste impacts associated with Alternative 2 are similar to the proposed project and are expected to be less than significant.

**Traffic/Transportation:** The construction traffic impacts associated with the proposed project are considered to be significant. Alternative 2 would result in less construction activities so that fewer workers and less traffic impacts would be expected. However, peak construction activities are associated with turnaround activities so that the elimination of the construction of the Sulfur Recovery facilities is not expected to reduce traffic/transportation impacts during construction to less than significant.

The proposed project impacts on traffic during the operational phase were considered to be less than significant and they would remain less than significant under this alternative. However, Alternative 2 would be expected to increase the truck traffic associated with the transport of additional aqueous ammonia generated by the Refinery by two trucks. This would, in effect, maintain current ammonia truck transport trips from the Refinery. Truck traffic is generally distributed throughout the work day and does not tend to impact peak hour traffic as much as worker traffic.

#### **6.4.3 ALTERNATIVE 3 – ELIMINATE VAPOR RECOVERY AND SAFETY FLARE SYSTEM**

**Air Quality:** Alternative 3 would eliminate the construction of the Vapor Recovery and Safety Flare System. Alternative 3 would result in a decrease in construction emissions from less workers and less equipment installation since the vapor recovery system would not be built; however, the major portions of the proposed project would still be built. The construction emissions under Alternative 3 are expected to remain significant.

Under Alternative 3, the operational emissions are potentially higher than the proposed project because PRDs on the No. 2 Crude Unit, the No. 2 RSU, and the Minalk/Merox Unit will continue to vent to the atmosphere under upset conditions if sufficient pressure is generated. Thus, Alternative 3 would not provide the potential VOC emission reductions associated with the proposed project. Nonetheless, operational emissions under Alternative 3 are expected to remain less than significant after mitigation, but slightly higher than the proposed project. In effect, PRD emissions would remain equivalent to the baseline conditions and the No Project Alternative. (Note: that the potential emission reductions were not included as part of the proposed PRO Project because those reductions are unknown).

Alternative 3 could result in higher emissions of TACs than the proposed project because PRDs from existing units would continue to vent to the atmosphere instead of to control equipment. The health risks associated with the proposed project (both carcinogenic and non-carcinogenic) were considered to be less than significant (see Chapter 4, subsection 4.2.2.5 Toxic Air Contaminants). The health risks under Alternative 3 are expected to remain the same, therefore, less than significant, as the proposed project because no emission reductions associated with connecting the PRDs to vapor control were included as part of the proposed project since the actual emission reductions are unknown.

**Energy:** Under Alternative 3, the Cogen Train D and related facilities would still be installed. Therefore, the impacts of Alternative 3 on energy resources are expected to be essentially the same as the proposed project because the vapor recovery system and flare do not use electricity and, therefore, are considered to be less than significant.

**Hazards:** The proposed project impacts on hazards are expected to be less than significant. Under Alternative 3, PRDs would continue to vent to the atmosphere instead of vapor control. Venting to the atmosphere relieves pressure and avoids overpressure

conditions that could lead to explosions. The hazard impacts under Alternative 3 are expected to remain the same as the existing Refinery; however existing hazards would be greater than the proposed project due to the potential for continued uncontrolled VOC emission releases. The hazard impacts associated with Alternative 3 are expected to remain less than significant.

**Hydrology/Water Quality:** The proposed project impacts on hydrology and water quality are expected to be less than significant. Alternative 3 is expected to require the same water demand and generate about the same amount of wastewater because the vapor recovery system and flare do not use water or generate wastewater. Therefore, the hydrology and water quality impacts of Alternative 3 are expected to be the same as the proposed project and remain less than significant.

**Noise:** The proposed project is expected to increase the noise levels at the Refinery due to operation of construction equipment and new Refinery equipment. The increased noise levels associated with the proposed project were considered less than significant during both the construction and operational phases of the proposed project as no noticeable noise increase offsite is expected. Implementation of Alternative 3 is expected to require fewer construction activities than the proposed project because fewer Refinery units would be constructed, so noise impacts are expected to be less than the proposed project, and less than significant.

Operational noise impacts associated with Alternative 3 are expected to be less than the proposed project as the compressors associated with the Vapor Recovery facilities would not be installed at the Refinery. However, other major noise generating sources included as part of the project are:

- The new equipment associated with the Cogen Train D;
- New pumps and compressors associated with the ISOMAX Unit; and
- New pumps, compressors, and blowers associated with the Sulfur Recovery facilities.

The noise-generating equipment associated with other equipment would still be installed. The location of the new equipment is a sufficient distance from sensitive receptors so that noise impacts under Alternative 3 are expected to remain less than significant.

**Solid/Hazardous Waste:** The proposed project solid/hazardous waste impacts are expected to be less than significant during both the construction and operational phases. Alternative 3 is not expected to alter the estimated generation of solid or hazardous wastes generated by the proposed project during the construction phase or operational phases. The vapor recovery facilities do not typically generate solid/hazardous wastes. Therefore, the solid/hazardous waste impacts associated with Alternative 3 are the same as for the proposed project and less than significant.

**Traffic/Transportation:** The construction traffic impacts associated with the proposed project are considered to be significant. Alternative 3 would result in less construction activities so that fewer workers and less traffic impacts would be expected. However, peak construction activities are associated with turnaround activities so that the elimination of the construction of the Vapor Recovery facilities is not expected to reduce traffic/transportation impacts during construction to less than significant.

The proposed project impacts on traffic during the operational phase were considered to be less than significant and they would remain less than significant under this alternative. Alternative 3 is not expected to result in an increase in traffic during operation and, as a result, traffic impacts during operation are equivalent to the proposed project.

#### **6.4.4 ALTERNATIVE 4 – ELIMINATE FCCU AND ALKYLATION UNIT MODIFICATIONS**

**Air Quality:** Alternative 4 would eliminate the construction activities associated with the modifications to the FCCU and Alkylation Unit. Alternative 4 would result in a decrease in construction emissions since the FCCU and Alkylation Unit would not be modified and, thus, less workers are needed and less equipment is installed. However, the major portions of the proposed project would still be built. The construction emissions under Alternative 4 are expected to remain significant.

Under Alternative 4, the operational emissions are expected to be less than the proposed project since the modifications to the FCCU and Alkylation Unit would not occur, eliminating fugitive VOC emissions from pumps, valves, flanges, etc. Thus, Alternative 4 would result in a decrease in VOC emissions from the proposed project. Overall, Alternative 4 is not expected to substantially alter the operational emissions associated with Refinery operations because the major project components would still be built; therefore, operational emissions are expected to remain less than significant.

Alternative 4 would eliminate the increased TAC emissions associated with the FCCU and Alkylation Unit modifications and the associated health risks. The health risks associated with the proposed project (both carcinogenic and non-carcinogenic) were considered to be less than significant and the health risks would remain less than significant under Alternative 4.

**Energy:** Under Alternative 4, the Cogen Train D and related facilities would still be installed. Therefore, the impacts of Alternative 4 on electricity are expected to be essentially the same as the proposed project and less than significant. Alternative 4 would result in the recovery of less LPG and other intermediate products than the proposed project, resulting in reduced energy efficiency in the Refinery operations, production of less CARB fuels, and potentially more flaring.

**Hazards:** The proposed project's hazards impacts are expected to be less than significant. Under Alternative 4, the hazard impacts associated with the modifications to

the FCCU and Alkylation Unit would be eliminated. Therefore, the hazard impacts under Alternative 4 are expected to be less than for the proposed project and, therefore, less than significant.

**Hydrology/Water Quality:** The proposed project impacts on hydrology and water quality are expected to be less than significant. Alternative 4 is expected to require the same water demand and generate about the same amount of wastewater. Therefore, the hydrology and water quality impacts of Alternative 4 are expected to be the same as the proposed project and remain less than significant.

**Noise:** The proposed project is expected to increase the noise levels at the Refinery due to operation of construction equipment and new Refinery equipment. The increased noise levels associated with the proposed project were considered less than significant during both the construction and operational phase of the proposed project as no noticeable noise increase is expected offsite. Implementation of Alternative 4 is expected to require less construction activities than the proposed project because fewer Refinery units would be constructed, so noise impacts are expected to be less than the proposed project, and less than significant.

Operational noise impacts associated with Alternative 4 are expected to be less than the proposed project as the cooling tower and new pumps associated with the modifications to the FCCU would not be installed at the Refinery. However, other major noise generating sources included as part of the project are:

- The new equipment associated with the Cogen Train D;
- New pumps and compressors associated with the ISOMAX Unit;
- New pumps, compressors and blowers associated with the Sulfur Recovery facilities; and
- New pumps and compressors associated with the vapor recovery system.

The noise-generating equipment associated with other equipment would still be installed. The location of the new equipment is a sufficient distance from sensitive receptors so that noise impacts under Alternative 4 are expected to remain less than significant.

**Solid/Hazardous Waste:** The proposed project impacts on solid/hazardous waste are expected to be less than significant during both the construction and operational phases. Alternative 4 is not expected to alter the estimated generation of solid or hazardous waste generated by the proposed project during the construction phase or operational phases. The modifications associated with the FCCU and Alkylation Unit will not require the construction of new foundations so contaminated soil requiring disposal is not expected to be uncovered during construction activities. Further, the modifications to the FCCU and Alkylation Unit are not expected to generate additional quantities of solid/hazardous

wastes, e.g., no increase in the use of catalyst is expected. Therefore, the solid/hazardous waste impacts associated with Alternative 4 are the same as for the proposed project and less than significant.

**Traffic/Transportation:** The construction traffic impacts associated with the proposed project are considered to be significant. Alternative 4 would result in less construction activities so that fewer workers and less traffic impacts would be expected. However, peak construction activities are associated with turnaround activities so that the elimination of the construction of the modifications to the FCCU and Alkylation Unit are not expected to reduce traffic/transportation impacts during construction to less than significant.

The proposed project impacts on traffic during the operational phase were considered to be less than significant and they would remain less than significant under this alternative. Alternative 4 is not expected to result in an increase in traffic during operation compared to the proposed project and, therefore, is not significant.

#### **6.4.5 ALTERNATIVE 5 – ELIMINATE THE NEW 49.9 MW COGENERATION UNIT**

**Air Quality:** Alternative 5 would eliminate the construction activities associated with the new Cogen Train D. Alternative 5 would result in a decrease in construction emissions since the Cogen Train D would not be built and, thus, less workers are needed and less equipment would be installed. However, the major portions of the proposed project would still be built. The construction emissions under Alternative 5 are expected to be less than for the proposed project, but would remain significant.

Under Alternative 5, the operational emissions from the Refinery are expected to be less than the proposed project since the Cogen Train D would not be constructed. However, the Refinery would be required to install an auxiliary boiler to generate steam to support Refinery operations and would also need to purchase an additional 29.9 MW of electricity, which would be produced at an off-site electrical generating facility and transmitted to Chevron for use. The emission increases associated with an auxiliary boiler are expected to be offset and, thus, air quality impacts would be less than significant. Even without the new Cogen Train D, Alternative 5 is expected to result in an overall increase in emissions in the South Coast Air Basin.

Alternative 5 would eliminate the increased TAC emissions associated with the Cogen Train D, but TAC emissions would increase from the new auxiliary boiler and an off-site electrical generating facility if it is located outside the SCAQMD's jurisdiction. The health risks associated with the proposed project (both carcinogenic and non-carcinogenic) were considered to be less than significant and the health risks are expected to remain less than significant under Alternative 5.

**Energy:** Alternative 5 will eliminate new electricity generated by the Refinery. The proposed project is estimated to require about 29.9 MW of additional electricity, which would be purchased from off-site electricity providers under Alternative 5. Therefore, Alternative 5 would result in the same electrical demand, but would not allow the Refinery to produce its own electricity requiring the purchase of additional electricity from off-site providers and generating potentially significant energy impacts.

**Hazards:** The proposed project impacts on hazards are expected to be less than significant. The hazard impacts associated solely with the new Cogen Train D are also considered to be less than significant. Alternative 5 would also require the installation of a new auxiliary boiler. A new boiler would be expected to operate on natural gas and/or refinery fuel gas and have similar hazards as the Cogen Train D (e.g., torch fire related to natural or refinery fuel gas). No increase in transport of hazardous materials compared to the proposed project is expected under Alternative 5. The hazard impacts under Alternative 5 are expected to be equivalent to the proposed project and less than significant.

**Hydrology/Water Quality:** The proposed project impacts on hydrology and water quality are expected to be less than significant. Alternative 5 is expected to require about the same water demand and generate about the same amount of wastewater as the proposed project. An auxiliary boiler to replace the steam produced by the Cogen Train D will be required under Alternative 5. Therefore, the hydrology and water quality impacts of Alternative 5 are expected to be similar to the proposed project and remain less than significant.

**Noise:** The proposed project is expected to increase the noise levels at the Refinery due to operation of construction equipment and new Refinery equipment. The increased noise levels associated with the proposed project were considered less than significant during both the construction and operational phases of the proposed project as no noticeable noise increase is expected offsite. Implementation of Alternative 5 is expected to require fewer construction activities than the proposed project because fewer Refinery units would be constructed, so noise impacts are expected to be less than the proposed project, and less than significant.

Operational noise impacts associated with Alternative 5 are expected to be less than the proposed project as the Cogen Train D would not be installed at the Refinery. However, other major noise generating sources included as part of the project are:

- New pumps and compressors associated with the ISOMAX Unit;
- New pumps, compressors and blowers associated with the Sulfur Recovery facilities; and
- New pumps and compressors associated with the vapor recovery system.

In addition to the above, a new auxiliary boiler would be installed under Alternative 4 to provide additional steam. The noise-generating equipment associated the boiler and with other equipment would be installed. The location of the new equipment is a sufficient distance from sensitive receptors so that noise impacts under Alternative 5 are expected to remain less than significant.

**Solid/Hazardous Waste:** The proposed project solid/hazardous waste impacts are expected to be less than significant during both the construction and operational phases. Alternative 5 is not expected to alter the estimated generation of solid or hazardous waste from the proposed project during the construction phase or operational phases. Cogeneration units do not typically generate solid/hazardous wastes. Under Alternative 5, the catalyst associated with the Cogen Train D SCR unit would be eliminated. However, an auxiliary boiler to generate additional steam would be required and BACT for the auxiliary boiler would also be an SCR unit. Therefore, the solid/hazardous waste impacts associated with Alternative 5 are approximately the same as for the proposed project and less than significant.

**Traffic/Transportation:** The construction traffic impacts associated with the proposed project are considered to be significant. Alternative 5 would result in less construction activities because Cogen Train D would not be constructed; however, the construction of an auxiliary boiler would be required. Alternative 5 would be expected to require fewer workers and less traffic impacts would be expected. However, peak construction activities are associated with turnaround activities so that the elimination of the Cogen Train D is not expected to reduce traffic/transportation impacts during construction to less than significant.

The proposed project impacts on traffic during the operational phase were considered to be less than significant and they would remain less than significant under this alternative. Haul trucks associated with transport of SCR catalysts to the Refinery and spent catalysts for recycling or disposal would be about the same as for the cogeneration unit. Alternative 5 is not expected to result in an increase in traffic during operation.

## 6.5 CONCLUSION

Table 6-1 compares the potential environmental impacts of the various alternatives relative to the proposed project. Based on the analyses herein, no feasible alternatives were identified that would reduce or eliminate the potentially significant air quality or traffic impacts during construction activities related to the proposed project and achieve the objectives of the proposed project. Only the No Project Alternative would eliminate these impacts, but would not achieve the goals of the proposed project.

TABLE 6-1

**Environmental Impacts of Alternatives  
As Compared to Proposed Project**

<b>ENVIRONMENTAL TOPIC</b>	<b>Proposed Project</b>	<b>Alt. 1</b>	<b>Alt. 2</b>	<b>Alt. 3</b>	<b>Alt.4</b>	<b>Alt. 5</b>
<b>Air Quality</b>						
Construction	S	NS(-)	S(-)	S(-)	S(-)	S(-)
Operation	MNS	NS(-)	MNS(=)	MNS(+)	MNS(-)	MNS(+)
Toxic Air Contaminants	NS	NS(-)	NS(-)	NS(+)	NS(-)	NS(+)
<b>Energy</b>	NS	NS(+)	NS(=)	NS(=)	NS(+)	S(+)
<b>Hazards</b>						
Operational Hazards	NS	NS(-)	NS(-)	NS(+)	NS(-)	NS(=)
Transportation Hazards	NS	NS(-)	NS(+)	NS(=)	NS(-)	NS(-)
<b>Hydrology/Water Quality</b>	NS	NS(-)	NS(=)	NS(=)	NS(=)	NS(=)
<b>Noise</b>						
Construction Noise	NS	NS(-)	NS(-)	NS(-)	NS(-)	NS(-)
Operational Noise	NS	NS(-)	NS(-)	NS(-)	NS(-)	NS(-)
<b>Solid/Hazardous Waste</b>	NS	NS(-)	NS(=)	NS(=)	NS(=)	NS(=)
<b>Transportation/Traffic</b>						
Construction	S	NS(-)	S(-)	S(-)	S(-)	S(-)
Operation	NS	NS(=)	NS(+)	NS(=)	NS(=)	NS(=)

Notes:

S = Significant

NS = Not Significant

MNS = Mitigated, Not Significant

(-) = Potential impacts are less than the proposed project.

(+) = Potential impacts are greater than the proposed project.

(=) = Potential impacts are approximately the same as the proposed project.

The No Project Alternative (Alternative 1) would prevent Chevron from: (1) Improving the energy efficiency, performance, and reliability of certain process units; (2) processing a wider range of crude oils, including higher sulfur-containing crude oils; (3) producing more low-sulfur fuel and other sulfur products; (4) improving the management of blending components of CARB fuels; and (5) reducing the potential for atmospheric releases and related emissions from PRDs in the No. 2 Crude Unit, No. 2 Residuum Unit, and the Minalk/Merox Unit. However, the No Project Alternative would eliminate the potentially significant impacts related to air quality and traffic during construction, making it an environmentally superior alternative.

Alternative 2 would result in significant impacts to air quality and traffic during construction, but would reduce the emissions and related traffic since the Sulfur Recovery facilities would not be built. Therefore, in addition to the No Project Alternative, Alternative 2 would be considered the environmentally superior alternative as it would reduce project impacts, but would not reduce potentially significant impacts

to less than significant. However, Alternative 2 would not allow the Refinery to meet the project objectives of: (1) producing low-sulfur fuel products and increase production of commercial grade elemental sulfur; and (2) allowing the Refinery to efficiently and reliably process a wider range of crude oils, including higher sulfur-containing crude oils.

Alternatives 3 and 4 would have similar impacts to the proposed project on air quality, energy, hazards/hazardous materials, noise and traffic. Alternatives 3 and 4 would result in significant impacts to air quality and traffic during construction, but would reduce the emissions and related traffic since fewer units would be built. Alternative 3 would not allow the Refinery to control the potential atmospheric releases and related emissions from PRDs in specified units. Alternative 4 would not include the energy efficiency modifications proposed for the FCCU and Alkylation Unit. Alternatives 3 and 4 would reduce project construction-related air quality and traffic impacts, but would not reduce potentially significant impacts to less than significant.

Alternative 5 would reduce project construction-related air quality and traffic impacts, but would not reduce potentially significant impacts to less than significant. Alternative 5 could result in significant energy impacts because the Cogen Train D, which would supply additional electricity to the Refinery, would not be constructed. The GHG emissions would be greater under Alternative 5 (see Chapter 5, subsection 52.4 – Greenhouse Gases for a detailed discussion). Therefore, the proposed project is preferred because it would most effectively attain all project objectives, whereas, all alternatives except the No Project Alternative do not eliminate significant adverse construction and traffic air quality impacts.

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